

Village Fiscal Policies as an Instrument for Poverty Alleviation: An Empirical Study of the Island Regions of North Maluku, Indonesia

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ABSTRACT

Purpose: This study aims to analyze the effect of village fiscal capacity and regional macroeconomic dynamics on poverty reduction in North Maluku Province.

Research Method: A quantitative approach was applied using panel data regression analysis covering nine regencies/municipalities in North Maluku during 2017–2024. The independent variables include Village Fiscal Transfers, Village Expenditure, Village Literacy, Human Development Index, and Developing Village Index, while the dependent variable is the Poverty Rate.

Results and Discussion: The findings show that Village Fiscal Transfers and the Human Development Index have a significant effect on reducing poverty. Meanwhile, Village Expenditure, Village Literacy, and the Developing Village Index do not show significant effects. These results indicate that fiscal capacity and human development are key factors in improving village welfare, particularly in archipelagic regions. Interregional effects also reveal significant variation, where areas with stronger institutional capacity and better fiscal governance tend to experience faster poverty reduction.

Implications: The findings suggest that village fiscal policy should be strengthened through improved governance, human development programs, and more effective allocation of village funds. Further research may include institutional quality and spatial inequality variables.

Originality: This study contributes by integrating village fiscal variables and regional macroeconomic indicators in analyzing poverty reduction in an archipelagic province.

Keywords: village fiscal transfer; village expenditure; human development financial; developing village financial; poverty reduction;

1. Introduction

Poverty remains a central issue in national development, particularly in rural and island regions that face geographical and structural challenges. (Priambodo, 2022) Although the government has launched various poverty alleviation programs, disparities in welfare between regions remain high, especially in eastern Indonesia (Wedi & Fathurrahman, 2025). North Maluku Province, as one of the island provinces, faces serious obstacles in reducing poverty rates due to limited access to infrastructure, basic services, and the still-low fiscal capacity of villages (Bailusy, 2019)



In the context of an archipelagic region like North Maluku Province, the Village Fund holds strategic potential as a fiscal instrument capable of reaching remote and vulnerable areas. The Village Fund is expected to promote equitable development and reduce economic disparities among villages (Ardiputra et al., 2025). However, its effectiveness in reducing poverty remains a subject of debate. Low institutional capacity, weak oversight, and suboptimal spending quality are serious issues hindering the Village Fund’s impact on welfare (Ghassani et al., 2023)

A number of empirical studies show varied results. (Ramadhana & Purnamadewi, 2021) found that the Village Fund has a significant impact on poverty reduction, particularly when used for productive projects. Conversely, other studies indicate that the Village Fund’s impact on poverty reduction is uneven, especially in areas with weak governance and minimal community participation. (Siagian et al., 2021) However, (Sigit & Kosasih, 2020); (A.A. Ngurah Gede & Iskandar, 2023), found that this impact tends to be strong in Java but weak in Eastern Indonesia, which has distinct geographical and social contexts. This raises important questions regarding the effectiveness of the Village Fund in island regions such as North Maluku.

Most previous studies also still rely on national or provincial aggregate data, thus failing to capture variations across districts/cities. Yet, the dynamics of poverty and the management of the Village Fund are significantly influenced by village-level characteristics. The lack of cross-regional panel data studies in archipelagic regions represents a gap that needs to be filled to provide a deeper understanding (Simanjuntak, 2021). The following is an overview of poverty levels in North Maluku:

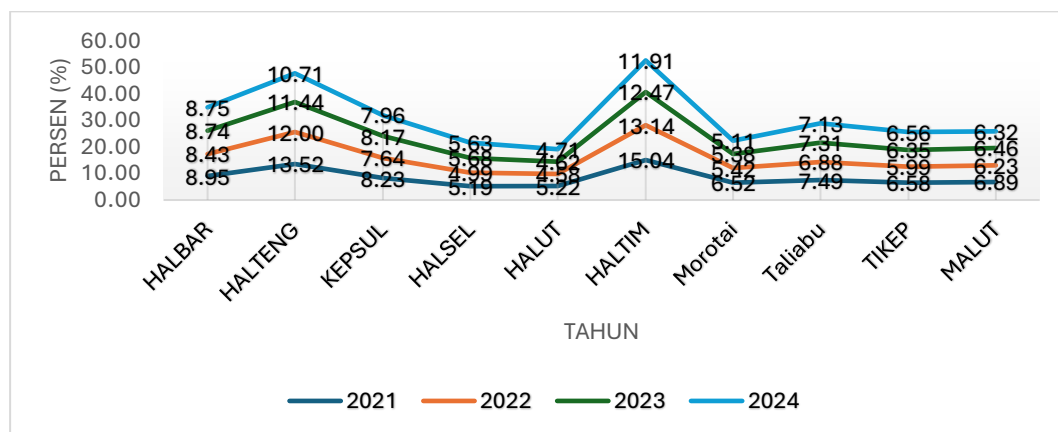


Figure 1. Poverty Rates in 9 Regencies/Cities of North Maluku Province (2021–2024)

Although there appears to be a downward trend in poverty, this trend does not always align with increases in village fiscal transfers, especially considering that the majority of Village Funds are used for basic needs rather than productive activities. In the case of South Halmahera and Taliabu Island, for example, poverty rates remained stagnant or even increased slightly post-pandemic despite the continued rise in Village Fund allocations (Ekananda Rivai, 2025). This indicates that the existence of the Village Fund alone is insufficient, and its effectiveness depends heavily on governance and policy direction at the local level.

This study will also examine whether there are significant variations in the impact of the Village Fund on poverty across districts/cities, reflecting the importance of a region-based approach. This analysis is relevant for formulating fiscal policies that are more responsive to contextual needs, particularly in island regions facing complex logistical and administrative challenges. The novelty of this research lies in its empirical focus on North Maluku Province as an archipelagic region, the use of panel data from the past eight years, and the modeling of the relationship between the Village Fund and poverty indicators. This study not only examines the direct impact of the Village Fund but also seeks to uncover how other factors—such as non-productive spending, institutional capacity, and geography—reinforce or, conversely, weaken the role of the Village Fund as a fiscal instrument.

Therefore, this study aims to: (1) Analyze the impact of Village Fiscal Transfers on poverty in 9 regencies and cities in North Maluku? (2) Analyze the impact of Village Expenditures on poverty in 9 regencies and cities in North Maluku? (3) To analyze the impact of Village Literacy on poverty in 9 regencies and cities in North Maluku? (4) To analyze the impact of the Human Development Index (HDI) on poverty in 9 regencies and cities in North Maluku? (5) To analyze the impact of the Village Development Index on poverty in 9 regencies and cities in North Maluku?

2. Literature Review and Hypothesis Development

2.1 Village Fiscal Theory

The theory of village finance is rooted in the concept of fiscal decentralization, in which the central government delegates some financial authority to local governments, including village governments (Muhlisin et al., 2025). Within this framework, villages, as the lowest level of government, are given the autonomy to manage public revenue and expenditures independently in order to improve the well-being of local communities. The objective of village fiscal autonomy is to foster vertical and horizontal fiscal equity and reduce development disparities across regions, including between villages.

According to Musgrave's classical theory (1959) as cited in (Yushkov, 2015), the primary functions of fiscal policy encompass allocation, distribution, and stabilization. When applied to the village context, these three functions encompass the village's role in allocating local resources, distributing the benefits of development fairly among its residents, and fostering local economic stability through village budget interventions that adapt to the village's socio-economic dynamics. (Muh Ardiansyah & Djaddang et al., 2025)

Law No. 6 of 2014 on Villages provides legal legitimacy for village fiscal autonomy. Under this law, villages have the authority to directly manage Village Funds, Village Owned Revenues (PADes), and other funding sources, with the aim of promoting participatory and sustainable local-based development (Mekonnen et al., 2018). This village fiscal autonomy is expected to serve as a strategic instrument in addressing structural poverty in villages, particularly in island regions facing geographical challenges.

Village fiscal autonomy is not merely about the amount of funds transferred to villages, but also concerns the effectiveness of management and the quality of village spending. According to Smoke (2015), the effectiveness of village fiscal autonomy is significantly influenced by the institutional capacity of the village, transparent budget management, and community participation in budget planning and oversight. Without good governance, village fiscal autonomy risks failing to serve as an effective tool for poverty reduction.



2.2 Theories of Poverty

Poverty is a condition in which individuals or households are unable to meet their minimum basic needs, such as food, clothing, shelter, education, and healthcare. Indonesia's Central Statistics Agency (BPS) defines poverty as the inability to meet basic needs, as measured by the poverty line (BPS, 2024). From a development perspective, poverty is not viewed solely in terms of income but also in terms of limited access to public services and economic opportunities (Sen, 1999).

- *Absolute vs. Relative Poverty*

Poverty can be classified as absolute or relative. Absolute poverty refers to the minimum standard for basic living needs, while relative poverty refers to income distribution inequality within society. (Miranti et al., 2013) This concept is crucial for measuring poverty in island regions like North Maluku, which exhibit varying living standards and accessibility.

- *Theory of Structural Poverty*

The theory of structural poverty posits that poverty stems from unequal and unjust economic, social, and political systems. Factors such as unequal access to education, infrastructure, and the labor market cause certain groups in society to remain trapped in a cycle of poverty (Sumarto et al., 2014). In island regions, structural inequality becomes more pronounced due to geographical isolation.

- *Individual Poverty Theory*

The individual theory attributes poverty to individual characteristics such as a lack of skills, motivation, or work ethic (Lewis, 1969). However, this approach has been criticized for ignoring external and systemic factors. In the context of village fiscal policy, this theory is less relevant because the root causes of poverty are more complex than mere individual behavior.

- *Cyclical Poverty Theory*

This theory argues that poverty is passed down through generations and becomes a vicious cycle that is difficult to break. Poor families tend to be unable to provide their children with an optimal education, so those children will also experience poverty as adults (Becker, 1964). Appropriate fiscal interventions at the village level have the potential to break this cycle through education and economic empowerment programs.

Poverty in a multidimensional approach accounts for non-monetary indicators such as health, education, and living standards (Alkire & Santos, 2014). The Multidimensional Poverty Index (MPI) is crucial for measuring poverty holistically, particularly in underdeveloped villages that are not only income-poor but also lack basic services. Archipelagic regions such as North Maluku face geographical challenges in accessing markets, education, and healthcare. A study by Achmad & Prayitno (2020) emphasizes that geographical location plays a significant role in determining poverty levels. Fiscal interventions through village infrastructure development can serve as a strategic tool for reducing poverty.

2.3 Village Development

Village development is part of a regional development framework that emphasizes the empowerment of local communities within the context of equitable and sustainable development. One of the main approaches in village development is the participatory approach, in which the village community is not merely an object of development but becomes the primary agent in planning, implementation, and

evaluation of development (Chambers, 1983). This approach emphasizes the importance of local knowledge and village institutions in driving context-appropriate development.

Within the framework of rural development, the theory of Integrated Rural Development (IRD) has evolved since the 1970s. It prioritizes simultaneous multisectoral development encompassing agriculture, basic infrastructure, education, and health, with active community involvement and adequate fiscal support from the government (Rondinelli, 1983). IRD emphasizes that integrated development is capable of driving poverty reduction in villages in a more sustainable manner compared to separate sectoral programs.

In line with this, the bottom-up development approach in village development also serves as an important reference. This theory emphasizes the importance of development that begins with the needs and local potential of village communities. This model is believed to be more responsive to local contexts, capable of enhancing policy effectiveness, and strengthening village institutional capacity (Storper, 1997). In the Indonesian context, village development gained legal legitimacy through Law No. 6 of 2014 on Villages, which marked a turning point in strengthening village autonomy. The Village Law provides space for villages to plan development participatively, manage their own finances through the Village Fund, and carry out local economic activities based on village assets (Ministry of Villages, 2015). This regulation represents a concrete form of the implementation of the theory of local development based on village autonomy.

In line with the local governance approach, village development theory also emphasizes the importance of good village governance. This governance encompasses transparency, accountability, participation, and the effectiveness of village public services as prerequisites for successful development (World Bank, 2004). If village institutions are weak, the potential for misuse of village funds and the failure of development programs increases. Furthermore, the theory of sustainable rural development holds that village development must address three key dimensions: the local economy, environmental sustainability, and social justice. This is particularly crucial in archipelagic regions such as North Maluku, which are vulnerable to resource exploitation and the marginalization of coastal villages (UNDP, 2019).

Village development is also closely linked to the theory of endogenous development, which emphasizes the importance of developing local potential—such as natural resources, culture, and socio-economic capacity—that grows from within the village itself (Ray, 1999). This prevents villages from relying solely on external aid and promotes sustainable empowerment. The theory of village development becomes increasingly relevant when linked to spatial inequality theory, which highlights disparities between regions and between villages as a result of inequities in resource allocation and access to development. This underscores the importance of fair and affirmative fiscal distribution toward underdeveloped and remote villages (Arsyad et al., 2021).

2.4 Village Expenditures

Village expenditures refer to all expenditures made by the village government within a fiscal year aimed at supporting the exercise of village authority in accordance with priorities in development, community empowerment, and community development. According to Minister of Home Affairs Regulation No. 20 of 2018 on Village Financial Management, village expenditures are classified into two main categories: operational expenditures and capital expenditures, which are directed toward improving services to the village community and reducing development disparities between regions.



Within the framework of local fiscal economics, Oates (1972), through the Decentralization Theorem, explains that fiscal decentralization—including expenditures by village governments—is more efficient because local authorities better understand the needs of the local community. In other words, village expenditures serve as a means to achieve effective local development by aligning public resource allocation policies with the preferences of the village community. “Optimal public service provision is more likely to be achieved when local governments have the autonomy to allocate their expenditures” (Oates, 1972).

Village spending is a local development instrument that can drive village economic growth, community empowerment, and improvements in residents’ quality of life. In the Community-Driven Development (CDD) approach, as explained by Mansuri and Rao (2013), community-participatory village spending allocation leads to more inclusive and sustainable development. “Participatory local spending increases both the efficiency and equity of public service delivery, especially in rural and underserved communities” (Mansuri & Rao, 2013).

The effectiveness of village spending in reducing poverty depends on four key dimensions: (1) alignment of budget allocations with community priority needs; (2) the planning and implementation capacity of the village government; (3) transparency and financial accountability of the village; and (4) active community participation in budget decision-making. Research by Fitriani et al. (2023) found that village spending directed toward productive economic empowerment programs has a significant impact on reducing poverty rates in underdeveloped villages.

2.5 Village Literacy

Village literacy is a component of socio-economic literacy that describes the capacity of individuals and village communities to access, understand, evaluate, and utilize information for development decision-making that impacts the quality of life of village communities. This literacy is not only related to conventional reading and writing skills but also encompasses financial literacy, digital literacy, legal literacy, and literacy regarding village development policies (UNESCO, 2017; Ministry of Education and Culture, 2020).

In the context of village development, literacy plays a crucial role in fostering active community participation in the planning, implementation, and monitoring of village programs, including the management of village funds. Low levels of community literacy, particularly fiscal literacy and policy literacy, can lead to information gaps and increase the likelihood of misuse of village resources (Sari et al., 2021).

According to Freire’s (1970) theory of social literacy, literacy is a tool to liberate communities from structural oppression through critical awareness. Within this framework, village literacy aims to foster a community that is aware of its rights and responsibilities in development, and capable of demanding transparency and accountability from the village government.

Literacy is also closely linked to the human capital theory as proposed by Becker (1964), who states that improving the quality of human resources through education and training will enhance individual productivity. In this context, village literacy serves as social and human capital that strengthens the community’s institutional capacity to manage development independently and sustainably. In national policy, the improvement of rural community literacy is reflected in Ministry of Village, Development of Disadvantaged Regions, and Transmigration Regulation No. 13 of 2020 on Priorities for the Use of Village Funds, which directs that village funds be used for community capacity



building, including in the form of training, extension services, and informal education based on village needs.

2.6 Human Development Index Theory (HDI)

The Human Development Index (HDI) is a composite measure developed by the United Nations Development Programme (UNDP) to assess a region's development success not only from an economic perspective but also from basic social aspects, namely health, education, and a decent standard of living (UNDP, 1990). The HDI reflects the overall quality of human development, aiming to place people at the center of development.

The concept of human development is rooted in the theory of "Development as Freedom" proposed by Amartya Sen (1999), which emphasizes that development is not merely about economic growth but also about enhancing people's substantive freedom to lead a life of value. Therefore, the measurement of the HDI takes into account three main dimensions: a long and healthy life (measured through life expectancy), education (average years of schooling and expected years of schooling), and a decent standard of living (GDP per capita or per capita expenditure).

The HDI plays a crucial role in regional development planning, as it serves as a comprehensive indicator for assessing the government's performance in improving the well-being of its people. In the Indonesian context, the HDI has become a macro-level indicator used by the Central Statistics Agency (BPS) to assess development achievements across regions. Law No. 25 of 2004 on the National Development Planning System and Presidential Regulation No. 59 of 2017 on the Implementation of Sustainable Development Goals also designate the HDI as a key indicator of national development.

3. Research Method

Panel data models are a quantitative analytical method used to analyze combined data comprising both time series and cross-sectional data, such as data from districts/cities within a province over several years (Dewintha et al., 2025). This model offers the advantage of capturing both temporal dynamics and individual differences across entities, while increasing the degrees of freedom and efficiency of parameter estimation.

The data analysis method in this study employs panel data analysis, specifically time series data from 2017–2024 and cross-sectional data for 9 districts/cities in North Maluku Province. The panel data model in this study was developed from several empirical research models by (Junia Rahma Nur Imani et al., 2025); (Saputra et al., 2025); (Putri, 2025), and (Wulandari et al., 2025). These four models were then modified and adapted to the research objectives, resulting in the following:

The basic model used is as follows:

$$\text{LnKEMISKit} = \beta_0 + \beta_1 \text{LnTFDit} + \beta_2 \text{LnBELDSAit} + \beta_3 \text{LnLITDSAit} + \beta_4 \text{LnIPMit} + \beta_5 \text{LnIDMit} + \epsilon_{it} \dots (3.1)$$

KEMISKit is the poverty rate of the *i*-th district/city in year *t* in North Maluku Province; TFDit is the village fiscal transfer of the *i*-th district/city in year *t* in North Maluku Province; BELDSAit is the village expenditure of the *i*-th district/city in year *t* in North Maluku Province; LITDSAit is the Village Literacy Score for the *i*-th district/city in year *t* in North Maluku Province; IPMit is the Human Development Index (HDI) for the *i*-th district/city in year *t* in North Maluku Province; IDMit is the Village Development Index

for the i -th district/city in year t in North Maluku Province; β_0 is the constant; β_1 and β_5 are regression coefficients; ϵ_{it} is the error term; i is the cross-sectional unit where: i is 1, 2, and 9, representing the nine districts/cities in North Maluku Province; t is the time-series unit where: t is the years 2017 through 2024.

Methods that can be used to estimate panel data regression models include the Common Effects, Fixed Effects, and Random Effects approaches (Madany et al., 2022). To determine which model to use from these three approaches, panel data model testing is required using the Chow Test, Hausman Test, and Lagrange Multiplier Test (LM Test). In addition, Classical Assumptions are tested through tests for Multicollinearity, Heteroscedasticity, and Autocorrelation. The results of the panel data model estimation are then statistically tested using the Simultaneous Significance Test (F-test), the Partial Test (t-test), and the Coefficient of Determination (R^2).

4. Results and Discussion

4.1 Analysis Results

The panel data model testing in this study was conducted using Eviews software. The initial step in the panel data model selection analysis involved estimating the panel data using the Common Effects Model (CEM), Fixed Effects Model (FEM), and Random Effects Model (REM). (Johan, 2021).

Table 1. Results of the Panel Data Model Test

Type of Test	Poverty Models		
Chow Test	F-Statistic	Prob.	Model Selected
Cross-section F	94.458474	0.0000*	FEM
Hausman test	Chi-Sq. Statistic	Prob.	Model Selected
Cross-section random	7.424566	0.1909*	REM
Langrange multiplier (LM)	Chi-Sq. Statistic	Prob.	Model Selected
Cross-section random	141.1965	0.0000*	REM

Info: *) Prob > 0,05

Based on the results of the Chow test in Table 1, the probability value for the cross-section F is less than 0.05, specifically $0.0000 < 0.05$. The interpretation of the Chow test results indicates that the selected model is the fixed-effects model (FEM). The results of the Hausman test in Table 1 show that the probability value for the random cross-section is greater than 0.05, namely $0.1909 > 0.05$. Based on the results of the Hausman test, it is concluded that the random effects model is superior to the fixed effects model; the REM is selected. The results of the Lagrange Multiplier (LM) test in Table 4.1 show that the probability value for cross-section random is less than 0.05, namely $0.0000 < 0.05$. Based on the results of the Lagrange Multiplier (LM) test, it is found that the random effects model is superior to the common effects model; since the REM was selected, it can be concluded that the regression model does not suffer from omitted variable bias, as the REM was selected.

4.1.1 Multicollinearity Test

The multicollinearity test aims to determine whether the regression model exhibits correlation among the independent variables. To detect multicollinearity, refer to Table 2:



Table 2. Results of the Multicollinearity Test

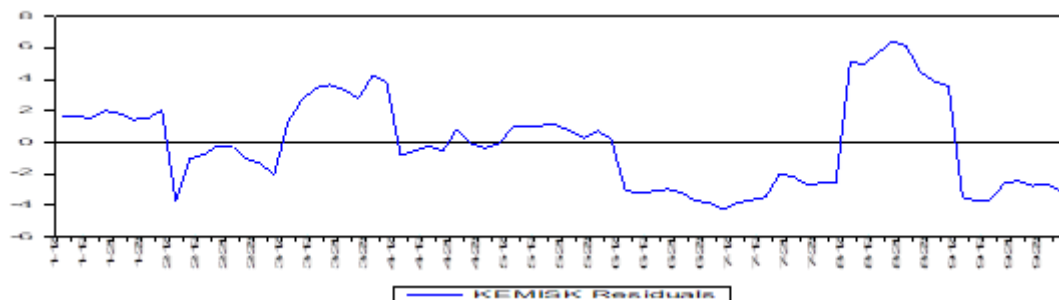
	TFD	BELDA	LITDESA	IPM	IDM
TFD	1.000000	0.291804	-0.041929	-0.161366	-0.155797
BELDA	0.291804	1.000000	-0.001718	0.288398	0.062176
LITDESA	-0.041929	-0.001718	1.000000	0.072512	0.224886
IPM	-0.161366	0.288398	0.072512	1.000000	0.056314
IDM	-0.155797	0.062176	0.224886	0.056314	1.000000

Source: Eviews data analysis (2025), sig. < 0.85

The results of the multicollinearity test in Table 2 show that the correlation coefficient between the TFD and BELDA variables is $0.291804 < 0.85$, the correlation coefficient between TFD and LITDESA is $-0.041929 < 0.85$, and the correlation coefficient between TFD and IPM is $-0.161366 < 0.85$, the correlation coefficient between TFD and IDM is $-0.155797 < 0.85$, and the correlation coefficient between IDM and IPM is $0.056314 < 0.85$. Therefore, it can be concluded that the data is free from multicollinearity.

4.1.2 Heteroscedasticity Test

The decision criteria are determined by examining the residual plot. If the values are significant or exceed the limits (500 and -500), the data is considered to exhibit heteroscedasticity; if they are not significant or fall within the limits (500 and -500), the data is considered free of heteroscedasticity. The output of the heteroscedasticity test is illustrated in Figure 2.



Source: Eviews data analysis (2025)

Figure 2. Results of the Heteroscedasticity Test

From the residual plot, it can be seen that the residuals do not cross the boundaries (500 and -500). This means that the residual variance can be said to be free from heteroscedasticity or to have passed the test for heteroscedasticity.

4.1.3 Autocorrelation Test

In the context of this study, which uses panel data, an autocorrelation test was conducted to ensure that the model does not violate classical assumptions that could affect the validity of the inference. One method used to test for autocorrelation in panel data is the Durbin-Watson method.

Table 3. Results of the Durbin-Watson Autocorrelation Test

Durbin-Watson Autocorrelation Test			
Provisions	k = 6 dan $\alpha = 5\%$		
N	72	Ho District	DW (d)-Stat = (0.828280)
dL	1.458	d < dL	1.592 < 0.8282
dU	1.801	d < dU	1.758 < 0.8282
Info	0 < d < dL = No Autocorrelation		

Info: 0 < d < dL = No Autocorrelation

Info:

- k = number of independent variables;
- N = number of observations;
- dL = lower value & dU upper limit of the Durbin-Watson statistic.

After selecting the Random Effects Model, with n = 72 and k = 6 (independent variables and intercept) $\alpha = 5\%$, the Durbin-Watson test yielded a DW(d)-Stat value of 0.8282 and a dL value of 1.592 > 0.8282, and a dU value of 1.758 > 0.8282; thus, the test results indicate no autocorrelation.

4.1.4 Panel Data Regression Analysis

Panel data regression is a statistical methodology that integrates time-series and cross-sectional observations, enabling a more comprehensive analysis compared to separate approaches (Durak, 2025). This approach facilitates better handling of heterogeneity among observation units and higher estimation efficiency due to a greater degree of freedom. The results of the panel data regression test are presented in Table 4.

Table 4. Results of the REM Regression Analysis for the Research Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	-5.917516	5.055302	-1.170556	0.2460
LnTFDit	0.010705	0.003671	2.915975	0.0048*
LnBELDAit	7.53E-05	6.87E-05	1.096560	0.2768
LnLITDESAit	-0.006815	0.008767	-0.777398	0.4397
LnIPMit	0.198497	0.075806	2.618480	0.0109*
LnIDMit	0.093206	1.388554	0.067124	0.9467
R-squared			0.181379	
Adjusted R-squared			0.936211	
S.E. of regression			0.752969	
F-statistic			2.924675	
Prob(F-statistic)			0.019107*	
Durbin-Watson stat			0.828280	

Info: *) Significant at the 5% level. Source: compiled (Eviews)

The panel data regression equation derived using the random effects model is as follows:

$$\text{LnKEMISKit} = -5.9175 + 0.0107\text{LnTFDit} + 7.5345\text{LnBELDAit} - 0.00681 \text{LnLITDESAit} + 0.1984\text{LnIPMit} + 0.0932\text{LnIDMit}$$



The simple regression equation for the panel data in Table 4 can be explained as follows:

The regression equation for the panel data in Table 4 can be interpreted as follows. The constant term of -5.9175 indicates that if all independent variables—namely Village Fiscal Transfers (TFD), Village Expenditures (BELDA), Village Literacy (LITDESA), Human Development Index (HDI), and Village Development Index (IDM), are all zero, the poverty rate (KEMISK) is estimated to be at the model's baseline value. The regression coefficient for Village Fiscal Transfer (TFD) of 0.0107 indicates that a one-unit increase in TFD will be followed by a 0.0107 increase in the poverty rate, assuming all other variables remain constant.

Furthermore, the Village Expenditure (BELDA) coefficient of 7.5345 indicates a positive relationship between village expenditure and the poverty rate, although its impact requires further examination through statistical significance. The Village Literacy (LITDESA) coefficient is negative at -0.00681 , meaning that an increase in village literacy tends to correlate with a decrease in poverty. Meanwhile, the Human Development Index (HDI) has a coefficient of 0.1984 , indicating that an increase in the HDI is followed by a rise in poverty in this model—a finding worth further analysis in the context of inter-regional development disparities. Finally, the coefficient for the Village Development Index (IDM) of 0.0932 indicates that an increase in the IDM is also positively correlated with poverty levels, assuming all other variables remain constant.

4.1.5 Hypothesis Testing

Hypothesis testing in this study uses panel data regression to analyze the effects of Village Fiscal Transfers (TFD), Village Expenditures (BELDA), Village Literacy (LITDESA), the Human Development Index (HDI), and the Village Development Index (IDM) on poverty rates in nine regencies/cities of North Maluku Province. The results of the partial t-test indicate that Village Fiscal Transfers have a significant effect on poverty with a probability value of 0.0048 ($p < 0.05$). Additionally, the HDI also has a significant effect with a probability value of 0.0109 ($p < 0.05$), underscoring the importance of human capital development in reducing poverty in island regions. Conversely, Village Expenditures, Village Literacy, and the IDM do not show significant partial effects, indicating that increased expenditure allocations and improvements in development indices have not yet directly led to a reduction in poverty, likely due to implementation constraints and the region's geographical characteristics. Simultaneously, all variables significantly influence poverty (Prob F= 0.0191), with a strong model explanatory power ($R^2=0.9362$).

4.1.6 Cross-Section Random Effects Model of Poverty

Table 5 presents the results of the model estimation analyzing rural poverty disparities among regency/city groups in North Maluku Province. This estimation uses cross-section effect (CR-Effect) values. The CR-Effect coefficients for all nine regencies/cities are negative for the poverty model, both partially and in total.

Tabel 5. Cross-section Random Effect

No	Regency/City	Value
1	Halmahera Barat	1.717039
2	Halmahera Tengah	-1.272850
3	Halmahera Selatan	3.162919
4	Halmahera Utara	-0.213006
5	Kepulauan Sula	0.780651
6	Pulau Morotai	-3.367004
7	Tidore Kepulauan	-2.820547
8	Halmahera Timur	4.995308
9	Taliabu	-2.982511
Total		-567.645
Average		-63.072

Source: *Eviews Data Analysis Results, 2025.*

The table presents the cross-sectional random effect estimates for nine regencies/cities in North Maluku Province, reflecting how region-specific characteristics influence rural poverty rates after controlling for all independent variables in the model. Positive random effect values indicate that a region experiences an increase in poverty disparity relative to the provincial average, while negative values indicate a decrease in disparity or a trend toward convergence of poverty across regions.

The results show that East Halmahera (4.995) and South Halmahera (3.163) have the highest positive effects, indicating relatively greater rural poverty disparities compared to other regions. Conversely, Morotai Island (-3.367), Taliabu (-2.983), and Tidore Islands (-2.821) recorded strong negative effects, indicating relative improvements in the equity of rural socioeconomic conditions. Aggregately, the negative average random effect indicates that rural poverty disparities across districts/cities tended to decrease during the study period, although inequalities remain concentrated in certain specific regions.

4.2 Discussion

4.2.1 The Effect of Village Fiscal Transfers on Poverty in 9 Regencies/Cities in North Maluku Province

The results of the analysis show that Village Fiscal Transfers have a significant effect on poverty rates in nine regencies/cities in North Maluku Province, with a probability value of 0.0048 (<0.05). This finding indicates that increases in the Village Fund and Village Fund Allocations make a tangible contribution to reducing poverty, particularly in island regions facing limited access and infrastructure. Theoretically, these results align with the government's fiscal distribution and allocation functions as outlined by Musgrave and Musgrave (1989), where fiscal transfers serve as instruments to correct inequality and ensure more equitable public service provision. In the village context, transfer funds strengthen local financial capacity to support basic infrastructure development and productive economic activities. These findings are consistent with the study by Suryahadi et al. (2019), which confirms that Village Funds are effective in reducing poverty when directed toward productive programs and community empowerment. The World Bank (2020) also emphasizes that the effectiveness of fiscal transfers depends heavily on governance, accountability, and community participation. These research results reinforce the argument that village fiscal transfers are a strategic instrument for poverty alleviation in North Maluku, in line with the mandate of Law No. 6 of 2014 on Villages. Institutional strengthening and



innovations based on local potential are key to ensuring that the positive impacts become increasingly sustainable and equitable across regions.

4.2.2 *The Impact of Village Expenditures on Poverty in 9 Regencies/Cities in North Maluku Province*

The research findings indicate that Village Expenditures do not have a significant impact on poverty levels in the nine regencies/cities of North Maluku Province, with a probability value of 0.2768 (>0.05). This finding indicates that increased village spending has not yet been able to provide a direct impact on reducing poverty in these island regions, even though the nominal village budget continues to increase annually. Theoretically, the government's fiscal allocation and distribution functions, as explained by Musgrave and Musgrave (1989), emphasize that public spending should improve welfare when directed toward productive sectors that generate economic multiplier effects. However, the results of this study show that village spending in North Maluku has not been fully oriented toward strengthening the productivity of the poor, but is still dominated by administrative and physical development spending, the impacts of which tend to be indirect. This finding aligns with Arsyad et al. (2021) and Fitriani et al. (2023), who assert that village spending in Eastern Indonesia often faces constraints related to planning capacity, governance, and development cost disparities due to geographical barriers. The World Bank (2020) also emphasizes that public spending does not automatically reduce poverty without accountability and effective program implementation. Furthermore, this lack of significance may reflect a lag effect, where the benefits of village spending only become apparent in the long term after infrastructure and local economic activities have matured (Hermawan & Dinar, 2021). Thus, a reorientation of village spending toward productive economic empowerment programs based on local potential is necessary to make its contribution to poverty alleviation more tangible and sustainable.

4.2.3 *The Impact of Village Literacy on Poverty in 9 Regencies/Cities in North Maluku Province*

Research results indicate that Village Literacy does not have a significant impact on poverty levels in the nine regencies/cities of North Maluku Province, with a probability value of 0.4397 (>0.05). This finding indicates that improvements in village literacy—whether in education, financial literacy, or digital literacy—have not yet been able to directly impact poverty reduction in this archipelagic region. Theoretically, literacy is part of human capital investment that should increase community productivity and income (Becker, 1964). However, this study's results show that literacy in North Maluku has not yet translated into productive economic activities. This aligns with Arsyad et al. (2021) and Fitriani et al. (2023), who emphasize that literacy without support from economic and institutional opportunities only yields passive knowledge, not improved well-being. From a participatory development perspective, Chambers (1995) asserts that rural literacy must be contextual and practical to drive socio-economic change. Furthermore, poverty is multidimensional, so the impact of literacy often operates indirectly and only becomes apparent in the long term (Alkire & Santos, 2014). The World Bank (2020) also emphasizes that literacy is only effective in reducing poverty when supported by market access, financial inclusion, and economic empowerment programs. The insignificance of the rural literacy variable indicates the need to reorient literacy programs toward entrepreneurship training, productive financial literacy, and the strengthening of local economies based on the potential of island regions so that their contribution to poverty reduction becomes more tangible and sustainable.



4.2.4 The Effect of the Human Development Index on Poverty in 9 Regencies/Cities in North Maluku Province

The research results indicate that the Human Development Index (HDI) has a significant effect on poverty levels in nine regencies/cities in North Maluku Province, with a probability value of 0.0109 (<0.05). This finding confirms that improving human capital through education, health, and purchasing power makes a tangible contribution to reducing poverty in island regions. Theoretically, these results align with Sen's (1999) Capability Approach, which emphasizes that human development expands individuals' freedom and capacity to lead productive lives. Investment in education and health is also a form of human capital enhancement that boosts productivity and income opportunities, thereby reducing poverty structurally (Becker, 1964). These findings are consistent with Arsyad et al. (2021), who demonstrated that an increase in the Human Development Index (HDI) is negatively correlated with poverty in Eastern Indonesia, despite facing geographical challenges and infrastructure limitations. In the context of North Maluku, regions with higher HDI scores tend to have lower poverty rates compared to areas with low HDI (BPS, 2024), demonstrating a strong link between human development and well-being. Furthermore, village fiscal policies as mandated by Law No. 6 of 2014 can serve as a key instrument to strengthen human development through the allocation of Village Funds to the education, health, and community empowerment sectors. Improving the HDI is a key strategy for accelerating inclusive and sustainable poverty alleviation in island regions.

4.2.5 The Impact of the Village Development Index on Poverty in 9 Regencies/Cities in North Maluku Province

Research findings indicate that the Village Development Index (IDM) does not have a significant impact on poverty levels in the nine regencies/cities of North Maluku Province, with a probability value of 0.9467 (>0.05). This finding indicates that improvements in village development status, as reflected in the IDM score, do not automatically reduce poverty in island regions. Conceptually, the IDM is a composite indicator encompassing social, economic, and ecological resilience as a measure of a village's capacity toward self-reliance (Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, 2021). However, in the context of North Maluku, IDM improvements tend to remain administrative in nature and emphasize the achievement of basic infrastructure, without being accompanied by productive economic transformations that directly impact community income. This aligns with Simanjuntak (2021), who asserts that village development in eastern Indonesia is often not integrated with the economic empowerment of local residents. Todaro and Smith (2020) emphasize that poverty alleviation requires development based on local capacity and the creation of economic opportunities, not merely an increase in formal indicators. Additionally, the archipelagic geographical character, limited connectivity, and high logistics costs further weaken the effectiveness of village development in promoting well-being (Sari & Wulandari, 2022). These findings underscore the need for a reorientation of village policies so that improvements in the IDM do not merely reflect administrative achievements but are also linked to economic outcomes through the strengthening of village enterprises, market access, and the development of maritime and agro-coastal economies that align with the characteristics of North Maluku.



5. Concluding Remarks and Recommendation

Based on a panel data regression analysis of nine regencies/cities in North Maluku Province for the period 2017–2024, this study shows that village fiscal transfers have a significant effect on reducing poverty rates, affirming their role as an instrument of fiscal distribution in archipelagic regions. Conversely, village expenditures and village literacy do not show a significant effect, indicating that increases in the budget and literacy capacity have not been effectively integrated with productive economic programs. The Human Development Index (HDI) has a significant effect on poverty reduction, underscoring the importance of development in education, health, and purchasing power. Meanwhile, the Village Development Index (IDM) is not significant, indicating a gap between village administrative achievements and community economic well-being.

Statement of Use of Generative AI

During the preparation of this work, the author used ChatGPT to assist in improving clarity and readability of the text. The author reviewed and edited the output and takes full responsibility for the content of the publication.

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