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Do Fiscal Autonomy and Economic Growth Reduce Poverty? Panel Evidence from Indonesian Provinces

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A R T I C L E I N F O

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A B S T R A C T

This study examines the effects of local fiscal autonomy and regional economic growth on poverty rates in Indonesia's 34 provinces for the period 2015–2025, using balanced panel data comprising 374 observations. Estimations were conducted using two approaches: a static panel model (Random Effects Model/REM with cluster-robust standard errors) and a dynamic panel model (two-stage Difference GMM with Windmeijer correction, 2005). Pre-estimation tests revealed significant cross-sectional dependence (Pesaran CD, $p < 0.001$) and no multicollinearity issues (VIF = 1.001). The Hausman test selected the REM as the best static model. The estimation results consistently show that local fiscal autonomy, proxied by the natural logarithm of Local Own-Source Revenue (ln(PAD)), has a negative and significant effect on poverty (REM: $\beta = -3.889$, $p < 0.001$; Difference GMM: $\beta = -2.754$, $p < 0.001$), thus supporting the first hypothesis. A 10 percent increase in real PAD is associated with a reduction in poverty of approximately 0.28 percentage points in the short term. Conversely, economic growth (GRDP) has a weak positive effect on poverty ($\beta = 0.007$, $p < 0.05$ in GMM), confirming the development paradox in which aggregate growth is not automatically transmitted to equitable poverty reduction; thus, the second hypothesis is rejected in the direction hypothesized. Simultaneously, both variables have a significant effect (Wald $\chi^2 = 51.607$, $p < 0.001$). The dynamic model reveals strong poverty persistence ($\rho = 0.405$, $p < 0.001$), reflecting a structural poverty trap.

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INTRODUCTION

Poverty remains the most fundamental and multidimensional development challenge faced by developing countries, including Indonesia, where limited access to education, health care, basic infrastructure, and a decent income creates a structural poverty trap that is difficult to break solely through a centralized (top-down) policy approach (Simanjuntak et al., 2022; Todaro & Smith, 2020). In the context of fiscal decentralization, which has been in place for more than two decades in Indonesia, local governments bear the primary responsibility for translating national development mandates into context-specific local policy instruments, including the optimization of Local Own-Source Revenue (PAD) as a proxy for fiscal autonomy, in order to create adequate fiscal space for the provision of equitable and high-quality public services (Maarif et al., 2023; Oates, 1999). On the other hand, regional economic growth—as represented by the growth rate of Regional Gross Domestic Product (RGDP)—theoretically serves as a driving force for job creation, increases in household disposable income, and the strengthening of the local tax base, which is ultimately expected to generate a multiplier effect in reducing aggregate poverty (Mankiw, 2019; Ravallion, 2019; Stiglitz, 2020). However, the empirical reality at the subnational level in Indonesia reveals a distinct development paradox: relatively stable economic growth at the national level is not necessarily accompanied by a uniform decline in poverty rates across provinces

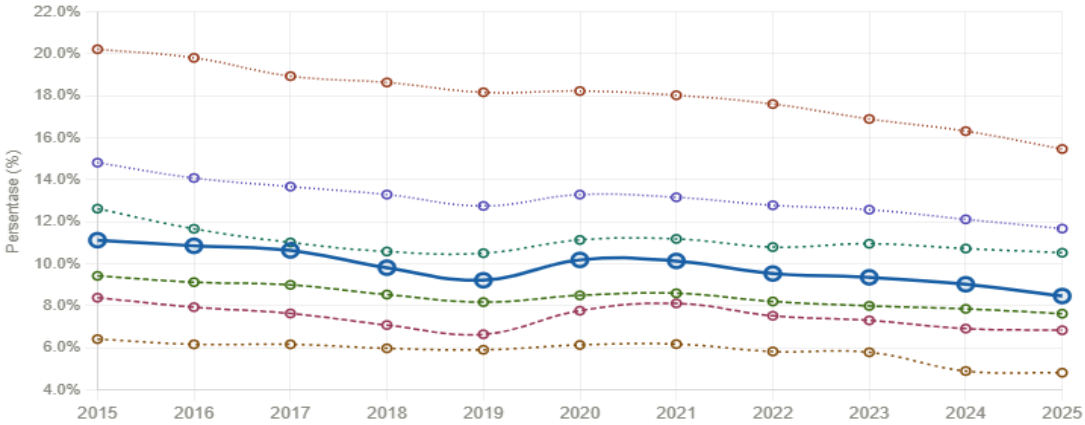


Figure 1. Poverty Rate Trends Across 34 Provinces in Indonesia, 2015–2025
Source: BPS – National Socioeconomic Survey (Susenas), data processed, 2025

As reflected in the persistent spatial disparities between western and eastern Indonesia and the widening Gini coefficient in a number of regions with high economic growth (Hill, 2021; Miranti, 2018; Mudrajad, 2021; Suryahadi et al., 2020). This paradoxical phenomenon indicates a structural mismatch in regional budget allocation, weak local governance capacity, and a lack of integration between sectoral and spatial dimensions in poverty alleviation programs, resulting in economic benefits not being distributed inclusively to the poorest segments of society (Arsyad, 2019; Prasetyo, 2022; Dartanto, 2021). From a theoretical perspective, a significant theoretical gap arises from the disagreement between the proposition of trickle-down economics—which predicts that aggregate growth will automatically lift the poor out of poverty (Kraay, 2016)— and the fiscal federalism theory approach, which emphasizes

that fiscal decentralization is effective in reducing poverty only if accompanied by strong institutional accountability and precise allocation of local government spending (Musgrave & Musgrave, 1989; Prud'homme, 2015). In terms of data, critical data gaps have been identified because the majority of previous studies relied on aggregate data at the district/city level or limited the analysis period to the pre-pandemic era, thus failing to capture the dynamics of contemporary economic recovery following the 2020–2021 systemic crisis, which fundamentally altered fiscal structures and poverty patterns at the provincial level (Suharsono, 2021; Olivia et al., 2020).

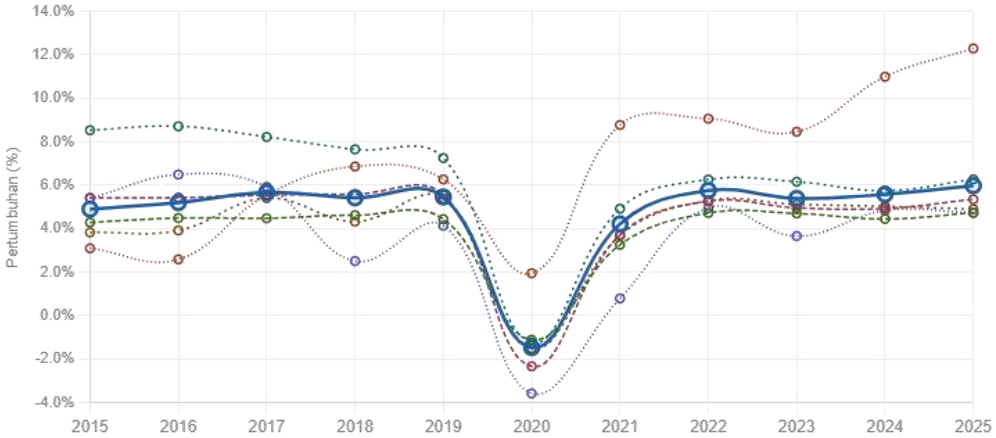


Figure 1.2. Trends in Economic Growth Rates (GRDP) of Indonesia's 34 Provinces, 2015–2025

Source: BPS – GRDP Growth Rates at 2010 Constant Prices, data processed, 2025

The most fundamental research gap lies in the scarcity of quantitative studies that simultaneously examine the impact of indicators of pure fiscal autonomy—measured by the ratio of local own-source revenue (PAD) to total local revenue—along with economic growth variables within a comprehensive panel model across all 34 provinces of Indonesia over an adequate time period, as most previous studies have been fragmented, focusing on testing a single variable or conducting partial sectoral analyses that do not allow for the generalization of fiscal policy at the national level (Maarif et al., 2023; Sidik, 2019; Brodjonegoro, 2021). Based on these three gaps—theoretical, data, and research—this study offers academic novelty in three main dimensions: first, integrating pure fiscal autonomy indicators with provincial macroeconomic growth variables within a single framework of static and dynamic panel estimations; second, utilizing the most up-to-date secondary panel data covering all 34 provinces in Indonesia during the 2015–2025 period, including phases of economic crisis and recovery;

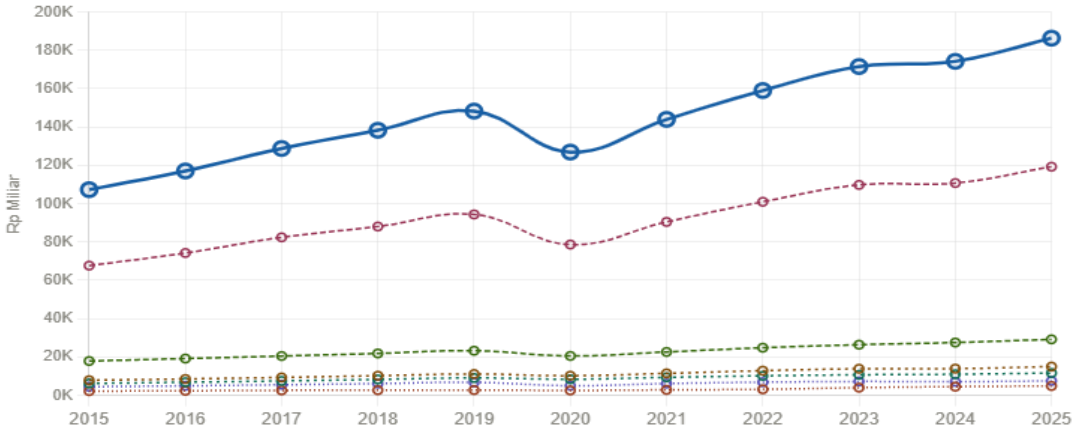


Figure 3. Trends in Local Revenue (PAD) Realization for 34 Provinces in Indonesia, 2015–2025
Source: BPS – Provincial Government Financial Statistics, Processed Data, 2025

Third, this study applies a panel econometric approach with rigorous diagnostic testing, including heteroskedasticity and multicollinearity tests, as well as controls for regional and temporal fixed effects, to produce unbiased and consistent estimates (Baltagi, 2021; Wooldridge, 2019). Accordingly, this study formulates three main research questions: (1) Does the level of regional fiscal autonomy have a statistically significant partial effect on poverty rates across provincial governments in Indonesia? (2) Does the economic growth rate have a statistically significant partial effect on poverty rates across provincial governments in Indonesia? (3) Do regional fiscal autonomy and economic growth rates jointly have a statistically significant effect on poverty rates across provincial governments in Indonesia?

The findings are expected to provide a robust empirical evidence base for evidence-based policymaking by central government ministries and provincial governments. This evidence can support improvements to regional fiscal transfer formulas, the alignment of spatial and sectoral targets, and the implementation of fiscal decentralization in ways that translate into tangible social justice and sustainable poverty reduction, in accordance with the constitutional mandate.

RESEARCH METHODS

Research Design and Approach

This study employs a quantitative approach with an explanatory research design to empirically examine and establish the causal relationships between regional fiscal autonomy, economic growth, and poverty rates across provincial governments in Indonesia (Gujarati & Porter, 2020). The study uses secondary data organized in a panel data structure, combining cross-sectional data from 34 provinces with time-series data covering the period from 2015 to 2025. This structure enables a more comprehensive analysis than either cross-sectional or time-series data analyzed separately (Baltagi, 2021).

Population and Sample

The population of this study comprises all provinces in Indonesia. A census or total sampling technique is employed, whereby all 34 provinces in Indonesia are included as units of analysis without exception. With an

observation period of 11 years (2015–2025), the total number of observations is 34 provinces × 11 years = 374 panel observations.

Data Types, Sources, and Operational Definitions of Variables

This study uses secondary data obtained from official publications of Statistics Indonesia (Badan Pusat Statistik/BPS) and the Directorate General of Fiscal Balance (Direktorat Jenderal Perimbangan Keuangan/DJPK), Ministry of Finance of the Republic of Indonesia. The research variables consist of one dependent variable and two independent variables, with the following operational definitions.

The dependent variable (Y) is the poverty rate, measured as the percentage of people living in poverty in each province in each year. The data are derived from the National Socioeconomic Survey (Survei Sosial Ekonomi Nasional/Susenas) published by BPS.

The first independent variable (X1) is regional fiscal autonomy, proxied by the ratio of Regional Original Revenue (Pendapatan Asli Daerah/PAD) to total regional revenue. This measure is consistent with the approach adopted by Risdiyanto et al. (2023) in analyzing the relationship between fiscal autonomy and poverty in Papua Province. PAD data are obtained from the Provincial Government Financial Statistics published by BPS and DJPK, Ministry of Finance.

The second independent variable (X2) is economic growth, measured by the growth rate of Gross Regional Domestic Product (GRDP) at constant 2010 prices. The data are sourced from BPS publications.

Data Analysis Techniques

In accordance with the research novelty presented in the introduction, the data analysis is conducted through two estimation approaches: static panel data models and dynamic panel data models. These approaches are intended to provide complementary results and strengthen the validity of the findings (Baltagi, 2021; Wooldridge, 2019).

Static Panel Data Model

The basic static panel regression model used in this study is formulated as follows:

$$Kemiskinan_{it} = \beta_0 + \beta_1 PAD_{it} + \beta_2 PDRB_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Notes: i denotes the province (1 through 34), t denotes the year (2015 through 2025), μ_i is the province-specific fixed effect, λ_t is the time-specific fixed effect, and ε_{it} is the error term.

Static panel data estimation is conducted using three approaches: the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The most appropriate model is selected through three statistical tests: the Chow test, which compares CEM with FEM; the Hausman test, which compares FEM with REM; and the Lagrange Multiplier (LM) test, which compares CEM with REM (Baltagi, 2021; Gujarati & Porter, 2020).

After selecting the most appropriate model, a series of classical assumption and diagnostic tests is conducted to assess the validity of the estimates. These include a multicollinearity test using the Variance Inflation Factor (VIF), a heteroskedasticity test using the Breusch–Pagan test, an

autocorrelation test using the Wooldridge test specifically designed for panel data, and a residual normality test (Wooldridge, 2019).

Dynamic Panel Data Model

To account for the possibility of intertemporal poverty persistence, or path dependence, this study also estimates a dynamic panel data model by including the one-year lag of the dependent variable as a predictor. The model follows the approaches developed by Arellano and Bond (1991) and Blundell and Bond (1998), and is formulated as follows:

$$Kemiskinan_{it} = \beta_0 + \rho\ Kemiskinan_{i,t-1} + \beta_1 PAD_{it} + \beta_2 PDRB_{it} + \mu_i + \varepsilon_{it}$$

Dynamic model estimation is conducted using the Generalized Method of Moments (GMM), specifically Difference GMM, developed by Arellano and Bond (1991), and System GMM, developed by Arellano and Bover (1995) and further refined by Blundell and Bond (1998). The selection of System GMM is based on the structure of the research data, which consists of a relatively large number of cross-sectional units (\(N=34\)) and a relatively short time dimension (\(T=11\)). This structure is generally consistent with the conditions under which this estimator is applied.

The validity of the dynamic model is assessed through two principal diagnostic tests. First, the Arellano–Bond serial correlation tests (AR(1) and AR(2)) are used to assess serial correlation in the differenced residuals. Second, the Sargan or Hansen test is used to evaluate the validity of the instruments employed in the estimation by testing the overidentifying restrictions and assessing whether the selected instruments are uncorrelated with the error term (Arellano & Bond, 1991; Blundell & Bond, 1998).

Hypothesis Testing

Hypothesis testing is conducted in three stages. First, a partial significance test (t-test) is used to determine the individual effect of each independent variable on the dependent variable. Second, a joint significance test (F-test or Wald test) is used to determine whether all independent variables jointly affect the dependent variable. Third, the coefficient of determination (\(R^2\)) is used to measure the proportion of variation in the dependent variable explained by the independent variables included in the model (Gujarati & Porter, 2020).

The statistical hypotheses are formulated as follows: H_0: $\beta = 0$ (tidak terdapat pengaruh signifikan), dan H_1: $\beta \neq 0$ (terdapat pengaruh signifikan). Hipotesis nol (H_0) ditolak apabila nilai probabilitas (p-value) lebih kecil dari taraf signifikansi 0,05.

Statistical Software

Data processing and analysis are conducted using Stata econometric software, which is selected for its ability to estimate both static and dynamic panel data models. In particular, the xtabond2 module is used to estimate System GMM and Difference GMM models (Arellano & Bond, 1991; Blundell & Bond, 1998).

RESULT AND DISCUSSION

Descriptive Statistics

Based on a balanced panel dataset covering 34 provinces from 2015 to 2025 (374 observations), the descriptive statistics for the three research variables are presented in Table 1 below.

Table 1. Descriptive Statistics of Research Variables

Variabel	obs	Mean	Std. Dev.	Min	Max
Poverty (%)	374	10,515	5,440	1,890	28,540
ln(PAD) (Rp Billion)	374	7,621	1,243	6,121	10,915
PDRB Growth (%)	374	4,738	3,668	-6,580	34,170

Source: BPS, data processed (2025). Note: ln(PAD) = natural logarithm of Regional Original Income; GDP Growth = GDP growth rate of ADHK 2010.

The average poverty rate in all provinces during the period 2015 to 2025 is 10.52 percent, with a minimum value of 1.89 percent (DKI Jakarta) and a maximum value of 28.54 percent (Papua). This very wide interprovincial poverty disparity, reflected in the standard deviation of 5.44 percent, confirms the existence of significant spatial inequality between provinces in the western and eastern regions of Indonesia as identified in the background of this study.

The average GDP growth rate of 4.74 percent reflects a positive economic growth performance in aggregate, but with a standard deviation of 3.67 percent and a very wide range of values (from -6.58 percent in the 2020 contraction year to 34.17 percent in North Maluku in 2025 driven by the nickel industry boom), it shows a high heterogeneity of growth between provinces and between times. The distribution of GDP that is skewed to the right (skewness = 1.91) with extreme kurtosis (15.10) indicates the existence of an upward outlier that is relevant to be noted in the robustness analysis.

Pre-Estimation Test Results

Data Stationary Test Panel (Im-Pesaran-Shin)

The results of the Im-Pesaran-Shin (IPS) test at the level level showed that the poverty variable was not stationary (W-stat = 0.1318; p = 0.895), while the GDP variables were stationary at the level (W-stat = -2.821; p = 0.005) and PAD were also stationary at the level (W-stat = 5.626; p < 0.001). The test on the first difference form showed all stationary variables (all p-values < 0.001). The combination of variables I(0) and I(1) in this panel framework has been anticipated through the use of GMM estimators that explicitly handle persistence through the lag specification of dependent variables, so as not to cause a straight regression problem (Arellano & Bond, 1991).

Interunit Dependency Test (CD Test)

The CD Curiosity Test showed a very significant interprovincial dependence on all variables: poverty (CD-stat = 23,444; p < 0.001), GDP (CD-stat = 59,912; p < 0.001), and PAD (CD-stat = 59,507; p < 0.001). The existence of this strong cross-sectional dependence is consistent with the influence of shared macroeconomic shocks, particularly the systemic contraction of the COVID-19 pandemic in 2020 to 2021 that affected all provinces simultaneously. These findings provide a strong justification for the use of cluster-robust standard errors at the provincial level in all static model estimates (Wooldridge, 2019).

Multicollinearity Test (VIF)

The correlation coefficient between ln(PAD) and GDP was very low (-0.026), and the Variance Inflation Factor (VIF) value for both variables was only 1.001. This value is well below the conventional threshold of 10, so it can be concluded that there is no significant multicollinearity problem between independent variables in the model (Gujarati & Porter, 2020).

Static Panel Model Selection

The Chow test comparing the Common Effect Model (CEM) with the Fixed Effect Model (FEM) yielded a statistical F-of 500,674 (df1 = 43, df2 = 328, p < 0.001), so that H0 stating that there was no fixed effect between units was conclusively rejected, proving that FEM is statistically more accurate than CEM. Furthermore, the Hausman Test comparing FEM with the Random Effect Model (REM) produced a chi-square statistic of 0.4410 (df = 2, p = 0.8021). A probability value well above the significance level of 0.05 indicates that there is no significant correlation between individual effects and independent variables, so the Random Effect Model (REM) was chosen as a more efficient static model (Baltagi, 2021).

Estimation Results of Static Panel Model (REM with Cluster-Robust SE)

Given the detection of interunit heteroscedasticity (Wald-stat = 207,955; p < 0.001) and first-order serial autocorrelation (Wooldridge: rho = 0.7397, t = 18,984, p < 0.001) in the residual model, the final REM estimate uses cluster-robust corrected standard errors at the provincial level (34 clusters). The results of the complete estimates are presented in Table 4.2.

Table 2. Random Effect Model (REM) Estimation Results with Cluster-Robust Standard Error

Variabel	Coeficin	Std. Error	T-Statistics	p-value	Say.
Konstanta	40.1074	4.8364	8.2928	0.0000	***
ln(PAD)	-3.8885	0.5480	-7.0954	0.0000	***
PDRB Growth	0.0200	0.0118	1.6989	0.0987	*
R2 (overall)	0.5428				
Wald chi2 (df=2)	51.607		p=0.0000		
N observations	374		34 provinces x 11 years		

*Note: *p<0.10; **p<0.05; p<0.01. Cluster-robust SE at the provincial level (34 clusters). Dependent variables: Poverty (%).*

Dynamic Panel Model Estimation Results

Difference GMM as the Main Dynamic Estimator

Given that PAD has a monotonic upward trend over the observation period (average ln(PAD) increased from 7.335 in 2015 to 7.901 in 2025), this condition has the potential to violate the mean-stationarity assumptions required for the validity of the GMM System (Blundell & Bond, 1998). Therefore, the Difference GMM (Arellano & Bond, 1991) was chosen as the main dynamic estimator, while the System GMM was presented as a comparative model. The results of the estimates are presented in Table 4.3.

Table 3. Estimation Results of Dynamic Panel Model (Difference GMM and System GMM)

Variabel	D-GMM Beta	SE	p	S-GMM Beta	SE	p	Sig. *
Poverty(t-1)	0.4050	0.0221	0.0000	0.9484	0.0022	0.0000	***
ln(PAD)	-2.7537	0.0770	0.0000	0.0535	0.0033	0.0000	***
PDRB Growth	0.0068	0.0028	0.0146	-0.0332	0.0039	0.0000	**
N observations	306			612			
Number of instruments	32			29			
Hansen J (p-value)	30.733	p=0.3781		26.283	p=0.4476		
AR(1) test (p-value)	-4.6669	p=0.0000		-7.6842	p=0.0000		
AR(2) test (p-value)	1.4142	p=0.1573		-0.1744	p=0.8615		

*Note: *Sig. based on Difference GMM (D-GMM). p<0.01; **p<0.05; *p<0.10. Two-step estimator with Windmeijer (2005) correction. D-GMM = Difference GMM (Arellano & Bond, 1991); S-GMM = System GMM (Blundell & Bond, 1998).*

The diagnostic validity test of the GMM difference showed very satisfactory results. The Hansen J test yielded a statistic of 30.7334 (df = 29, p = 0.3781), so that the H0 validity of the instrument was irresistible, which confirmed that all 32 instruments used (not exceeding N = 34 according to Roodman's rules, 2009) were valid and exogenous. The Arellano-Bond test showed a significant first-order autocorrelation (AR(1): z = -4.6669, p < 0.001) as a consequence of the anticipated first-difference transformation, but there was no significant second-order autocorrelation (AR(2): z = 1.4142, p = 0.1573), which is a core requirement of the validity of the GMM model (Arellano & Bond, 1991).

The GMM System, although diagnostically it also passed the Hansen J (p = 0.4476) and AR(2) (p = 0.8615) tests, resulted in a PAD coefficient that turned the mark to be positive (0.05346), which was inconsistent with the REM and Difference GMM results. This inconsistency was attributed to the strong deterministic trend of the PAD, so that the instrument at the System GMM level equation was weak and the estimator was unreliable for this variable. Therefore, the Difference GMM was used as the main reference for dynamic inference in this study.

Robustness Checks

Table 4. Summary of Sturdiness Test Results

Specification	b_PAD	p_PAD	b_PDRB	p_PDRB	Remarks

REM Cluster-Robust (static main model)	-3.8885	0.0000	0.0200	0.0987	Selected static models
Diff-GMM lag-4 (dynamic main model)	-2.7537	0.0000	0.0068	0.0146	Main dynamic models
Diff-GMM max lag inst.=2	-2.6223	0.0000	0.0025	0.6044	n_inst=19; H.p=0.142
Diff-GMM max lag inst.=3	-2.6928	0.0000	0.0042	0.1771	n_inst=26; H.p=0.255
Diff-GMM max lag inst.=4	-2.7537	0.0000	0.0068	0.0146	n_inst=32; H.p=0.378
Diff-GMM max lag inst.=6	-2.6736	0.0000	0.0033	0.2438	n_inst=41; H.p=0.824
FEM two-way (excl. 2020-2021)	-4.8123	0.0000	0.0129	0.4615	RC2: no crisis period
FEM (excl. Papua & Papua Barat)	-1.0945	0.0989	—	—	RC3: without the largest outlier
FEM two-way (winsorizing p1-p99)	-3.9202	0.0000	0.0094	0.6004	RC4: extreme value mitigation

Note: b_PAD = ln coefficient(PAD); p_PAD = p-value; b_PDRB = GDP growth coefficient; p_PDRB = p-value of GDP.

The robustness test results consistently confirmed the direction of the negative and significant influence of PAD on poverty across alternative specifications. At the variation in the amount of lag of the Difference GMM instrument (RC1), the PAD coefficient moved in a narrow range between -2.622 to -2.754 and was entirely significant at $p < 0.001$, while the diagnostic tests (Hansen J and AR(2)) consistently met the validity requirements. Testing excluding the 2020 to 2021 crisis period (RC2) yielded a slightly larger PAD coefficient in absolute value (-4.812), indicating that the impact of PAD on poverty was even stronger under normal economic conditions. The expenditure of two outlier provinces, Papua and West Papua (RC3), resulted in weakening but remaining negative coefficients, indicating that the two provinces have a large contribution to the fiscal-poverty relationship in eastern Indonesia. Winsorizing testing (RC4) yielded results that were almost identical to the main estimates. Overall, this evidence of robustness is very strong and unambiguous.

Discussion

The Effect of Fiscal Independence (PAD) on Poverty

The results of the estimates consistently show that regional fiscal independence has a negative and significant effect on the provincial poverty rate (REM: beta = -3.8885, $p < 0.001$; Difference GMM: beta = -2.7537, $p < 0.001$). This means that a one percent increase in real PAD is on average associated with a decrease in the poverty rate of 2.75 to 3.89 percentage points in a dynamic framework, after controlling for interprovincial heterogeneity and joint time shocks. These findings are consistent with the proposition of fiscal federalism theory which states that strong sources of regional revenue allow local governments to expand public spending on pro-poverty sectors such as health services, education, and basic infrastructure (Musgrave & Musgrave, 1989; Oates,

1999), which increases the capacity and access of the poor to productive resources.

On the dynamic dimension, a significant dependent lag coefficient (rho = 0.4050, p < 0.001) indicates a strong persistence of poverty: about 40 percent of last year's poverty level is still carried over to the next. This reflects the nature of poverty trapped in long-term structural traps (poverty traps), as argued by Dartanto (2021). Implicitly, fiscal interventions that increase PAD will have an increasingly greater cumulative effect over time, as any decrease in poverty in one period will bring positive residual effects in the next through negative persistence mechanisms.

The Effect of Economic Growth (GDP) on Poverty

The results of the estimates show a more complex pattern related to the influence of economic growth on poverty. In the static model (REM), the GDP coefficient was positive and weak significantly (beta = 0.0200, p = 0.0987), while in the dynamic model Difference GMM the GDP coefficient was also positive and significant (beta = 0.0068, p = 0.0146). The finding that economic growth correlates positively with poverty -- albeit in very small magnitude -- is an empirical confirmation of the development paradox identified in the introduction to this study.

This growth-poverty paradox can be explained through several structural mechanisms. First, the provinces with the highest GDP growth (such as North Maluku with a growth of 34.17 percent in 2025 driven by the nickel industry boom) are enclave-based growth, where the benefits of growth are highly concentrated in the capital-intensive sector and not spread to the lower layers of local society. Second, within the framework of two-way fixed effects that control over time trends, the positive GDP-poverty relationship in a given period is likely to reflect that years of high growth (2021 to 2022 as a post-pandemic bounce-back) coincide with still high levels of poverty due to the inertia of the 2020 shock (Olivia et al., 2020; Stiglitz, 2020). Third, aggregate growth does not send an adequate distributional signal to the poor if it is not accompanied by policies that expand access to formal economic opportunities (Ravallion, 2019). These findings reinforce the narrative of incompatibility between trickle-down economics and the empirical reality of the distribution of growth benefits at the Indonesian subnational level (Miranti, 2018; Hill, 2021; Suryahadi et al., 2020).

Policy Implications

Based on the above empirical findings, there are two main policy implications. First, strengthening regional fiscal capacity through increasing PAD is a proven and robust instrument in reducing poverty. Reforms that expand the regional tax base, optimize levies, and improve the efficiency of regional wealth management need to be prioritized, especially in provinces with low PAD ratios in eastern Indonesia. The GMM Difference Coefficient (beta = -2.754) indicates that every 10 percent increase in real PAD is associated with a reduction in poverty of about 0.28 percentage points in the short term, with greater cumulative effects over time.

Second, the positive findings of the GDP coefficient indicate the need to reorient the quality of economic growth at the regional level. High aggregate growth is not enough if the benefits are concentrated in the capital-intensive or

enclave-based sector. Policies that ensure inclusive growth through the development of labor-intensive sectors, strengthening MSMEs, and increasing access to the labor market for the poor are needed, in line with the fiscal federalism framework that emphasizes accountability of regional spending and the accuracy of poverty alleviation program targets (Prud'homme, 2015; Prasetyo, 2022).

High poverty persistence (rho = 0.405 in Difference GMM) also implies that short- and partial policy interventions will not be enough to break the structural poverty trap. Sustainable long-term policy commitments are needed, with synchronization between regional fiscal capacity building and community empowerment programs that strengthen human capital as the main modality of social mobility (Simanjuntak et al., 2022; Todaro & Smith, 2020).

CONCLUSION

This study aims to examine the influence of regional fiscal independence as proxied through the natural logarithm of Regional Original Revenue (PAD)) and regional economic growth (ADHK GDP growth rate) on poverty levels in 34 provinces in Indonesia during the period 2015 to 2025, by utilizing balanced panel data as many as 374 observations. Estimation was carried out through two complementary paths, namely the static panel model (Random Effect Model/REM with cluster-robust standard error) and the dynamic panel model (two-stage GMM difference with Windmeijer correction), all of which have gone through a series of pre-estimation tests, model selection tests, classical assumption tests, GMM diagnostic tests, and six robustness tests. Based on the overall estimation results, three main conclusions can be drawn as follows.

First, regional fiscal independence has a negative and partially significant effect on the poverty rate in provincial governments in Indonesia (REM: β = -3.8885, $p < 0.001$; Difference GMM: β = -2.7537, $p < 0.001$), thus H1 is accepted. An increase in regional fiscal capacity reflected in the growth of PAD on average is associated with a significant decrease in poverty rates, consistent across both static and dynamic model specifications. The GMM Difference Coefficient indicates that every 10 percent increase in real PAD is associated with a decrease in poverty of about 0.28 percentage points in the short term, with the cumulative effect getting bigger over time. These findings are consistent with fiscal federalism theory which asserts that strong regional fiscal independence allows for the expansion of public spending in pro-poverty sectors such as health, education, and basic infrastructure (Musgrave & Musgrave, 1989; Oates, 1999; Risdiyanto et al., 2023).

Second, regional economic growth has a positive and partially significant effect on the poverty rate in provincial governments in Indonesia (REM: β = 0.0200, $p = 0.0987$; Difference GMM: β = 0.0068, $p = 0.0146$), thus H2 is rejected according to the hypothetically negative direction, but this finding substantially confirms the development paradox that is the central issue of this study. High aggregate economic growth is not automatically transmitted to an equitable reduction in poverty between provinces, but rather has a weak positive correlation with poverty. This phenomenon is mainly driven by the enclave nature of growth in natural resource-based provinces, the inertia effects of

poverty after the 2020 systemic shock, and the inability of aggregate growth to distribute benefits to the bottom groups of society without explicit policy interventions (Miranti, 2018; Ravallion, 2019; Hill, 2021; Stiglitz, 2020).

Third, simultaneously, regional fiscal independence and economic growth together have a significant effect on the poverty rate in provincial governments in Indonesia, as shown by the Wald chi-square of 51,607 ($p < 0.001$) in the REM model, with H3 accepted. In addition, the finding of a significant dependent lag coefficient ($\rho = 0.4050$, $p < 0.001$) in the dynamic model reveals the persistence of strong poverty between time, where about 40 percent of the poverty level of one year is still carried over to the next. This reflects the existence of a structural poverty trap that cannot be overcome solely through aggregate economic growth without being accompanied by the strengthening of sustainable regional fiscal independence (Dartanto, 2021; Prasetyo, 2022).

The three conclusions above are consistent and robust for all robustness tests conducted, including variations in GMM instrument lag specifications, exclusion of systemic crisis periods from 2020 to 2021, detection and issuance of outliers, and winsorizing the extreme values of independent variables. This strong robustness strengthens the credibility of the causal inference of this study as a reliable evidence-based policy basis.

Research Limitations

This study has several limitations that need to be honestly acknowledged. First, the inability of the GMM System as a more efficient dynamic estimator due to the strong deterministic trend of PAD shows that the PAD data of Indonesian provinces does not meet the mean-stationarity assumptions required by Blundell-Bond (1998), so the dynamic inferences in this study rely entirely on the Difference GMM. Second, the limitation of the observation period (T = 11 years) even though it covers the crisis and recovery phases, limits the ability to identify the long-term effects of fiscal independence more precisely through panel cointegration analysis. Third, the fiscal independence proxy used (nominal value of PAD in logarithmic form) does not reflect the dimension of regional spending quality, i.e. how much PAD is allocated to pro-poverty programs, which is the main transmission mechanism between fiscal and poverty. Fourth, changes in administrative policies (territorial expansion, changes in fiscal governance, and adjustments to the General Allocation Fund formula) during the observation period may give rise to structural discontinuity that is not fully absorbed by the fixed effects of time in the model.

ADVICE

Based on the above limitations, some directions for future research development can be suggested as follows.

1. Future research can incorporate variables of the quality of regional expenditure (such as the ratio of capital expenditure and social expenditure to total APBD expenditure) as a mediating variable between fiscal independence and poverty, to identify fiscal transmission mechanisms in a more explicit and measurable manner.
2. The use of multidimensional poverty data (MPI) published by BPS as an alternative proxy for dependent variables can provide a more

comprehensive picture than the percentage of poor population based on monetary poverty lines.

3. The study with district/city analysis units (514 districts/cities) will provide much greater cross-section variation (N >> T), thus allowing for the implementation of a more valid GMM System and spatial effect estimation through spatial panel econometrics to identify fiscal spillover between regions.
4. The addition of institutional control variables such as the Human Development Index (HDI), the quality of regional governance (government effectiveness index), and the level of regional investment can strengthen causal identification and reduce the potential for omitted variable bias in a model that currently uses only two main independent variables.

Heterogeneous panel estimation approaches such as the Mean Group (MG) estimator or the Pooled Mean Group (PMG) estimator (Pesaran, Shin, & Smith, 1999) can be applied to identify the heterogeneity of poverty responses to interprovincial fiscal changes, which has implications for the design of more segmented and contextual fiscal policies.

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