

Article

Effects of per capita GRDP, education, and social assistance on poverty

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Keywords: poverty; GRDP per capita; educational attainment; social assistance; panel data

Abstract

Poverty reduction requires understanding how regional economic development, education, and fiscal redistribution interact in disadvantaged areas. This study examines the associations of gross regional domestic product (GRDP) per capita, mean years of schooling, and realized social assistance expenditure with poverty rates in five regencies with the highest poverty rates in Lampung Province, Indonesia. Secondary panel data covering 2018–2024 were analyzed using a logarithmic fixed effects specification selected through Chow and Hausman tests, with White cross-section robust standard errors. GRDP per capita and mean years of schooling were negatively and significantly associated with poverty, with estimated elasticities of -1.067 and -1.607 , respectively. Social assistance expenditure exhibited a positive but statistically insignificant coefficient, providing insufficient evidence of a poverty-reducing association within the observed period. The model, including regency fixed effects, explained approximately 91% of poverty variation. These findings support coordinated policies that expand productive economic opportunities, improve educational attainment, and strengthen assistance targeting and implementation. However, the observational design limits causal interpretation, and the findings remain specific to the selected regencies and period.

Introduction

Poverty reduction remains a central priority in Indonesia's national and regional development agendas. Poverty reflects insufficient income and persistent barriers to education, healthcare, and productive economic opportunities. Addressing these barriers requires policies that connect economic development, human capital formation, and social protection. From a welfare economics perspective, income redistribution provides a rationale for government intervention to improve the welfare of disadvantaged households. Contemporary discussions of the welfare state similarly emphasise the importance of public policies in addressing inequality and economic vulnerability (Papachashvili et al., 2023). Social assistance, subsidies, and cash transfers therefore represent important instruments for protecting household consumption and supporting access to basic needs.

Regional economic development constitutes another potential pathway to poverty reduction. Todaro and Smith (2020) explain that expanding productive activities can increase income and employment opportunities, creating conditions that support improvements in living standards. Gross regional domestic product (GRDP) per capita is commonly used to describe regional economic output relative to population size. However, higher GRDP per capita does not necessarily indicate that economic gains are distributed equally across households. The poverty-reducing potential of economic expansion depends on whether disadvantaged groups can participate in productive activities and access the resulting employment opportunities. Although the *trickle-down effect* suggests that economic expansion may benefit lower-income groups through employment and income channels, these benefits should be examined empirically rather than assumed to occur automatically (Todaro & Smith, 2015).

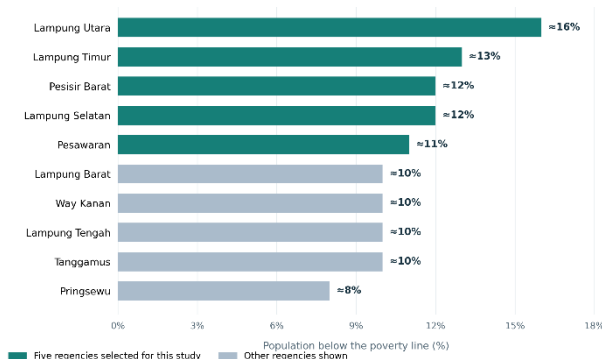
Education provides a complementary pathway by strengthening individuals' capacity to participate in economic development. Human capital theory links educational investment to improvements in skills, productivity, and earning potential. Nevertheless, the translation of educational attainment into economic welfare also depends on labour market conditions and the availability of suitable employment. Brown et al. (2020) critically examine these relationships,

highlighting the limitations of assuming that educational investment invariably produces improved economic outcomes. From a human development perspective, education also expands capabilities and opportunities beyond its contribution to earnings (UNDP, 2024). Mean years of schooling consequently provides a relevant indicator for examining the relationship between educational attainment and regional poverty.

Social assistance expenditure represents the redistributive component of this policy framework. By providing support to vulnerable households, social assistance can reduce immediate financial pressures and help maintain access to essential goods and services. However, expenditure levels alone do not establish programme effectiveness. Outcomes may depend on targeting accuracy, benefit adequacy, delivery mechanisms, and continuity of support. Moreover, higher expenditure may reflect a government response to elevated poverty rather than an independently identifiable source of poverty reduction. Research on regional subsidies and social assistance expenditure provides a relevant basis for examining redistribution, although findings concerning income inequality should be distinguished from findings concerning poverty rates (Ramdani, 2024). These considerations make it necessary to assess social assistance alongside regional economic output and education.

Lampung Province offers a relevant setting for investigating these relationships. According to Statistics Indonesia, its poverty rate reached 10.62% in September 2024, equivalent to approximately 939,000 people (BPS, 2025). Despite the reported decline from the preceding period, this figure indicates that more than one in ten residents remained below the poverty line. The persistence of poverty underscores the need to identify development strategies that improve economic opportunities while strengthening education and social protection. Provincial indicators, however, can conceal differences between regencies, making a more geographically focused analysis necessary.

Fig 1.
Poverty Rates in the
Ten Regencies with
the Highest Poverty
Rates in Lampung
Province, 2024
Source: Statistics
Indonesia, Lampung
Province (BPS, 2024).



The regional figures reported in the study identify Lampung Utara (16.92%), Lampung Timur (13.19%), Lampung Selatan (12.57%), Pesisir Barat (12.51%), and Pesawaran (11.93%) as the five regencies with the highest poverty rates in Lampung Province in 2024 (BPS, 2024). These differences highlight the importance of examining poverty within specific regional contexts. Focusing on these regencies enables the study to investigate whether changes in economic output, educational attainment, and social assistance expenditure are associated with poverty changes in areas facing particularly substantial development challenges. Their selection provides a targeted analytical scope, although the findings cannot automatically be generalised to all regencies in Lampung or Indonesia.

Previous research provides a foundation for examining the economic and social dimensions of poverty. Najib Putri and Yuliana (2023) investigate the relationship between economic growth and poverty, considering unemployment as a mediating variable in Probolinggo. Their research draws attention to employment as a potential mechanism connecting economic expansion with poverty outcomes. Research by Ramdani (2024), meanwhile, examines regional subsidy and social assistance expenditure in relation to income inequality, contributing to discussions of fiscal redistribution. Taken together, these studies support the relevance of economic opportunities and government expenditure, while also showing why outcomes, geographical coverage, and analytical mechanisms must be distinguished carefully.

The present study addresses a contextual and analytical question concerning how regional economic output, educational attainment, and social assistance expenditure relate to poverty within selected high-poverty regencies. Examining these factors jointly allows their associations to be assessed within a common empirical framework. The panel structure further enables the analysis to account for persistent differences between regencies while observing changes over time. This approach extends the discussion beyond the expectation that economic development, education,

and fiscal redistribution necessarily produce equivalent poverty outcomes. It also allows potentially different associations to be identified without interpreting observational estimates as definitive evidence of causality.

Accordingly, this study examines the associations of GRDP per capita, mean years of schooling, and realised social assistance expenditure with poverty rates in the five selected regencies of Lampung Province during 2018–2024. Its contribution lies in providing geographically focused evidence on the relationship between productive development, human capital, and fiscal redistribution in high-poverty areas. The findings are expected to inform coordinated regional policies that expand economic participation, improve educational attainment, and strengthen the targeting and implementation of social assistance.

Literature Review

Poverty. Poverty refers to a condition in which individuals or households lack sufficient resources to meet basic needs and maintain an acceptable standard of living. Although income is central to its measurement, poverty also involves restricted access to education, healthcare, housing, and productive employment. These interconnected disadvantages can reinforce economic vulnerability and limit opportunities for upward mobility (Todaro & Smith, 2020).

Statistics Indonesia measures monetary poverty using a basic needs approach, under which individuals are classified as poor when their expenditure falls below the poverty line established for minimum food and non-food requirements (BPS, 2024). Accordingly, the poverty rate represents the percentage of the population living below this threshold. This measure captures expenditure-based deprivation, while the broader concept of poverty encompasses additional dimensions of disadvantage.

At the regional level, poverty may reflect limited productive capacity, unequal access to economic opportunities, low educational attainment, and constraints on public service provision. Economic expansion, educational investment, and fiscal redistribution offer complementary pathways for addressing these conditions. This study therefore examines GRDP per capita, mean years of schooling, and realised social assistance expenditure as factors associated with poverty rates in the five selected regencies of Lampung Province.

Gross Regional Domestic Product per Capita. GRDP per capita measures the value of economic output generated within a region divided by its population. It provides an indicator of regional economic capacity, although it does not directly measure the income received by each resident or reveal how economic gains are distributed. Consequently, an increase in GRDP per capita may coexist with persistent poverty when productive opportunities and income gains are concentrated among particular groups.

The development perspective presented by Todaro and Smith (2020) suggests that expanding economic activity can reduce poverty through employment creation, higher productivity, and increased earnings. The *trickle-down* argument similarly proposes that economic expansion may benefit disadvantaged households through greater labour demand and related business opportunities. However, these transmission mechanisms depend on the structure of production and the extent to which poorer households participate in economic activities.

Ravallion (2016) emphasises the importance of considering distribution when examining the relationship between economic growth and poverty reduction. Higher regional output is therefore expected to be associated with lower poverty when its benefits reach disadvantaged households. Research on redistribution, including Ramdani (2024), also highlights the relevance of fiscal policy to distributional outcomes, complementing the analysis of productive economic capacity.

Mean Years of Schooling. Mean years of schooling measures educational attainment by summarising the average number of years of formal education completed by the population covered by the relevant statistical indicator. It serves as a proxy for the educational component of human capital, although it does not directly capture learning quality, vocational competence, or the suitability of skills for local labour markets.

Human capital theory explains education as an investment that can improve knowledge, skills, and labour productivity. These improvements may increase access to employment and strengthen earning capacity, thereby reducing household vulnerability to poverty. Psacharopoulos and Patrinos (2018) provide evidence on the economic returns to educational investment, supporting the relevance of education to income-generating opportunities.

Education also contributes to welfare through mechanisms extending beyond earnings. The human development perspective identifies education as a means of expanding capabilities, informed decision-making, and participation in social and economic life (UNDP, 2024). Nevertheless,

educational attainment does not guarantee improved economic outcomes when suitable employment opportunities are limited. [Brown et al. \(2020\)](#) critically examine this constraint, indicating that the benefits of education should be interpreted alongside labour market conditions.

Research by [Najib Putri and Yuliana \(2023\)](#), which considers unemployment in the relationship between economic growth and poverty, reinforces the relevance of employment opportunities to poverty analysis. Although that study does not directly establish the relationship between mean years of schooling and poverty examined here, it provides complementary context for understanding how productive participation may influence regional welfare.

Social Assistance. Social assistance comprises public support intended to protect vulnerable individuals and households from economic deprivation. In this study, realised social assistance expenditure represents actual government spending under the relevant budget category. It measures fiscal implementation rather than the adequacy of benefits received by individual households or the overall coverage of social protection programmes.

Welfare economics provides a rationale for redistribution by recognising that public intervention can improve the welfare of disadvantaged groups. Contemporary welfare-state discussions similarly examine the role of government in addressing inequality, social risks, and economic insecurity ([Papachashvili et al., 2023](#)). Social assistance may contribute to these objectives by supporting consumption and helping vulnerable households maintain access to essential goods and services.

[Barr \(2020\)](#) situates social protection within the broader functions of the welfare state, including redistribution and protection against economic risks. However, the relationship between expenditure and poverty depends on targeting accuracy, benefit adequacy, delivery reliability, and programme continuity. [Ramdani \(2024\)](#) examines regional subsidies and social assistance expenditure in relation to income inequality, providing a relevant fiscal redistribution perspective. Its findings should nevertheless be distinguished from direct evidence concerning poverty reduction.

An additional consideration is policy responsiveness. Regions experiencing higher poverty may allocate more resources to social assistance, producing a positive expenditure–poverty association even when assistance protects recipients from greater deprivation. Consequently, the direction of an estimated association must be interpreted cautiously, particularly when the research design does not independently identify causal effects.

Hypothesis Development

GRDP per Capita and Poverty. The relationship between regional economic development and poverty can be explained through changes in productive capacity, employment opportunities, and household earnings. Higher GRDP per capita indicates greater economic output relative to the size of the population. When this increase reflects expanding productive activities that involve disadvantaged households, it can strengthen their capacity to generate income and meet basic needs. [Todaro and Smith \(2020\)](#) explain that economic development can support poverty reduction through improvements in productivity, employment creation, and the expansion of economic opportunities.

Several mechanisms underpin this expected relationship. First, expanding regional production may increase demand for labour, enabling unemployed or underemployed individuals to obtain more stable sources of income. Second, productivity improvements may increase earnings and strengthen the viability of small businesses. Third, stronger economic activity may expand the resources available for public services and infrastructure that support economic participation. Together, these mechanisms provide a basis for expecting higher regional output per capita to be associated with lower poverty.

However, the distribution of economic gains determines how strongly these mechanisms benefit poorer households. Output growth concentrated in activities with limited local employment or restricted access for disadvantaged groups may produce relatively small improvements in poverty outcomes. [Ravallion \(2016\)](#) emphasises that the relationship between growth and poverty reduction depends on distributional conditions. Accordingly, the *trickle-down* argument should be understood as a potential transmission mechanism rather than a guarantee that higher output automatically improves the welfare of all residents.

In the selected regencies of Lampung Province, GRDP per capita is therefore examined as an indicator of the economic capacity that may support poverty reduction. Holding educational attainment and social assistance expenditure constant, increases in GRDP per capita are expected to correspond to lower poverty rates. This expectation concerns the direction of the empirical association and does not imply that aggregate output alone adequately captures inclusive development.

H1: GRDP per capita is negatively associated with the poverty rate.

Mean Years of Schooling and Poverty. Human capital theory provides the principal explanation for the expected relationship between educational attainment and poverty. Education develops knowledge and skills that can improve labour productivity, strengthen earning capacity, and expand access to economic opportunities. Mean years of schooling captures the accumulated level of formal education within the population and therefore serves as a proxy for the educational component of regional human capital. Evidence on returns to educational investment supports the expectation that greater educational attainment can improve economic opportunities and income prospects (Psacharopoulos & Patrinos, 2018).

Education may contribute to poverty reduction through several related mechanisms. Higher educational attainment can improve individuals' ability to obtain employment, adapt to changing job requirements, and undertake more productive economic activities. It may also strengthen the capacity to evaluate information, manage household resources, and make decisions concerning employment or business opportunities. From the human development perspective, education expands capabilities and participation, making its contribution to welfare broader than the earnings channel alone (UNDP, 2024).

Nevertheless, the economic benefits of schooling depend on the conditions in which acquired knowledge and skills are used. Educational attainment may yield limited income gains when local labour markets offer few suitable employment opportunities or when schooling does not develop relevant competencies. Brown et al. (2020) critically examine the assumption that educational investment necessarily translates into improved economic outcomes. Mean years of schooling should consequently be interpreted as an indicator of educational attainment rather than a complete measure of human capital quality or labour market success.

Within the selected regions, greater educational attainment is expected to strengthen the capacity of residents to participate in productive activities and reduce their vulnerability to poverty. Although these benefits may accumulate gradually, the theoretical mechanisms support an inverse relationship between mean years of schooling and poverty rates. Holding GRDP per capita and social assistance expenditure constant, increases in mean years of schooling are therefore expected to be associated with lower poverty.

H2: Mean years of schooling is negatively associated with the poverty rate.

Social Assistance Expenditure and Poverty. The expected relationship between social assistance expenditure and poverty is grounded in the redistributive and protective functions of public policy. Social assistance provides resources to vulnerable households whose market income may be insufficient to meet basic needs. By supplementing household resources, assistance can ease immediate financial pressures and support essential consumption. Welfare-state perspectives identify redistribution and protection against economic insecurity as important functions of government intervention (Barr, 2020; Papachashvili et al., 2023).

The potential poverty-reducing mechanism operates through both immediate support and the prevention of deeper deprivation. Assistance may help households maintain expenditure on food and other necessities when earnings are insufficient or disrupted. Reliable support may also reduce the need to adopt coping strategies that weaken future economic capacity, such as withdrawing children from education or disposing of productive assets. These mechanisms provide a theoretical basis for expecting well-implemented social assistance to contribute to lower poverty.

However, realised expenditure does not directly indicate how effectively assistance reaches vulnerable households. Its relationship with poverty depends on targeting accuracy, benefit adequacy, coverage, and delivery reliability. Increased expenditure may have limited observable benefits when assistance fails to reach eligible recipients or provides insufficient support relative to their needs. Ramdani (2024), through an examination of regional subsidies and social assistance expenditure in relation to income inequality, provides a complementary perspective on fiscal redistribution. The distinction between inequality and poverty nevertheless remains important when interpreting the relevance of this evidence.

Policy responsiveness further complicates the expected empirical relationship. Governments may increase assistance expenditure when poverty rises, making higher spending coincide with greater deprivation. A positive association can therefore reflect the allocation of support towards areas with greater needs rather than demonstrate that assistance increases poverty. Similarly, a statistically insignificant coefficient would provide insufficient evidence of an association within the observed sample and period; it would not independently establish programme ineffectiveness.

Despite these qualifications, the redistributive mechanism supports a negative directional hypothesis. When additional realised expenditure translates into adequate and reliable support for eligible households, it is expected to strengthen their ability to meet basic needs. Holding GRDP per capita and educational attainment constant, higher realised social assistance expenditure is therefore hypothesised to be associated with lower poverty rates in the selected regencies.

H3: Realised social assistance expenditure is negatively associated with the poverty rate.

Methods

Research Design and Data. This study employed a quantitative panel-data approach to examine the associations between regional economic output, educational attainment, social assistance expenditure, and poverty. Secondary annual data were obtained from Statistics Indonesia (BPS), regional financial agencies, and relevant local government publications. The study covered Lampung Utara, Lampung Timur, Lampung Selatan, Pesisir Barat, and Pesawaran during 2018–2024, comprising 35 regency-year observations. These regencies were purposively selected based on their high poverty rates in 2024 (BPS, 2024). Consequently, the findings apply to the selected areas rather than representing all regencies in Lampung Province.

Variables and Model Specification. The dependent variable was the poverty rate, measured as the percentage of residents living below the poverty line. The independent variables were GRDP per capita, mean years of schooling, and realised social assistance expenditure. A logarithmic specification was used to express the estimated relationships as elasticities:

$$\ln(POV_{it}) = \alpha + \beta_1 \ln(GRDPC_{it}) + \beta_2 \ln(MYS_{it}) + \beta_3 \ln(SA_{it}) + \mu_i + \varepsilon_{it}$$

Estimation and Diagnostic Procedures. The analysis was conducted using EViews 13. Pooled ordinary least squares, fixed effects, and random effects specifications were considered. The Chow test compared pooled and fixed effects models, while the Hausman test assessed fixed versus random effects. Both tests supported the fixed effects specification at the 5% significance level.

Residual diagnostics included the Jarque–Bera normality test, variance inflation factors (VIFs), the White heteroskedasticity test, and an autocorrelation test. VIF values below 10 were interpreted as indicating no severe multicollinearity (Santoso, 2017). Normality was assessed for the residuals rather than the original variables (Ghozali, 2019), while heteroskedasticity testing examined the constancy of residual variance (Gujarati, 2013). Following evidence of autocorrelation, the selected model was estimated with White cross-section robust standard errors. This adjustment concerns the estimated covariance matrix and does not eliminate serial dependence or establish unbiased coefficients.

Hypothesis Testing. Individual coefficients were evaluated using two-sided t-tests at a 5% significance level. A directional hypothesis was supported when the estimated coefficient was negative and statistically significant. The F-test assessed joint significance, while R^2 summarised model fit, including the contribution of regency fixed effects (Gujarati, 2013). Estimates were interpreted as conditional associations because the observational design does not establish causal effects.

Result and Discussion

Panel Model Selection. Model selection first assessed whether persistent differences between regencies required a fixed effects specification. The Chow test compared pooled ordinary least squares with fixed effects, while the Hausman test compared fixed and random effects. Table 1 summarises the results of both specification tests.

Table 1. Panel Model Selection Results

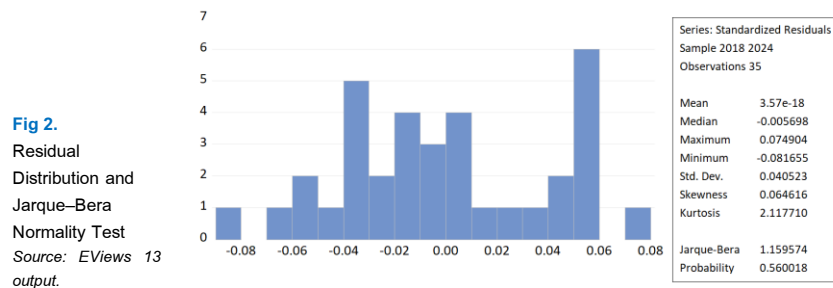
Test	Statistic	Degrees of freedom	p-value	Selected specification
Chow: cross-section F	62.942247	(4, 27)	0.0000	Fixed effects over pooled OLS
Chow: cross-section chi-square	81.709130	4	0.0000	Fixed effects over pooled OLS
Hausman	17.621073	3	0.0005	Fixed effects over random effects

Source: EViews 13 output.

The Chow test rejected the null hypothesis of common intercepts, indicating that regency-specific effects should be retained. The Hausman test also rejected its null hypothesis, favouring fixed effects over random effects. Together, these results support the fixed effects specification for

the subsequent analysis. Following model selection, residual behaviour and multicollinearity were examined to assess potential limitations affecting statistical inference.

Diagnostic Tests. Diagnostic testing assessed residual normality, multicollinearity, heteroskedasticity, and autocorrelation. Figure 2 presents the residual distribution and the associated Jarque–Bera normality assessment.



The Jarque–Bera test returned a p-value of 0.560018, exceeding the 5% significance threshold. The null hypothesis of normally distributed residuals was therefore not rejected. This result provides no evidence against residual normality within the estimated model, although it does not establish that all model assumptions are satisfied. The remaining diagnostic results are summarised in Table 2 to identify whether correlations among explanatory variables or dependence in the residuals require further attention.

Table 2. Multicollinearity and Residual Diagnostic Results

Diagnostic	Variable or component	Statistic	Reference criterion	Interpretation
Multicollinearity	GRDP per capita	VIF = 2.498776	VIF <10	No severe multicollinearity indicated
Multicollinearity	Mean years of schooling	VIF = 1.343093	VIF <10	No severe multicollinearity indicated
Multicollinearity	Social assistance expenditure	VIF = 2.206629	VIF <10	No severe multicollinearity indicated
White heteroskedasticity test	Residuals	$\chi^2 = 14.832860$	$\chi^2_{0.05,9} = 16.919$	Homoskedasticity not rejected
Autocorrelation test	Residuals	$\chi^2 = 15.453865$	$\chi^2_{0.05,2} = 5.991$	No-autocorrelation hypothesis rejected

Source: EViews 13 output.

All VIF values were below 10, indicating no severe multicollinearity among the explanatory variables under the stated criterion. The White test statistic was below its critical value, providing insufficient evidence to reject homoskedasticity. In contrast, the autocorrelation statistic exceeded its critical value, indicating residual dependence over time.

Following the autocorrelation finding, the fixed effects model was reported using White cross-section robust standard errors. This covariance adjustment changes the assessment of coefficient uncertainty; it does not remove serial dependence from the residuals. The resulting estimates are presented below.

Fixed Effects Estimates and Hypothesis Testing. The logarithmic specification estimates the percentage change in the poverty rate associated with a 1% change in each explanatory variable, holding the remaining variables and regency fixed effects constant. Table 3 reports the coefficients, standard errors, test statistics, and hypothesis decisions.

Table 3. Fixed Effects Regression Estimates and Hypothesis Decisions

Variable	Coefficient	Standard error	t-statistic	p-value	Hypothesis decision
Constant	9.344930	1.109567	8.422143	0.0002	—

ln(GRDP per capita)	-1.066516	0.381319	-2.796911	0.0313	H1 supported
ln(Mean years of schooling)	-1.606889	0.217454	-7.389565	0.0003	H2 supported
ln(Social assistance expenditure)	0.011848	0.012214	0.969979	0.3695	H3 not supported

Source: Fixed effects estimation output, EViews 13.

Note: Coefficients, standard errors, t-statistics, and p-values are reproduced from the supplied output. Hypothesis decisions follow the reported p-values.

GRDP per capita had a negative coefficient of -1.066516 and was statistically significant according to the reported p-value of 0.0313. A 1% increase in GRDP per capita was associated with an approximately 1.07% decrease in the poverty rate, conditional on the other included variables and regency fixed effects. The negative and significant association supports H1.

Mean years of schooling also exhibited a negative and statistically significant association with poverty. Its coefficient of -1.606889 indicates that a 1% increase in mean years of schooling was associated with an approximately 1.61% decrease in the poverty rate. The reported p-value of 0.0003 supports H2. This percentage change should be distinguished from an increase of one additional year of schooling.

Social assistance expenditure had a positive coefficient of 0.011848, but its reported p-value of 0.3695 exceeded the significance threshold. The results therefore provide insufficient evidence of a statistically significant association between expenditure and poverty in the observed sample and period. H3 was not supported. The estimate does not establish that assistance increased poverty or that the programmes were ineffective. The constant represents the model intercept under the adopted fixed effects parameterisation. Because a zero logarithmic value corresponds to an original variable value of one, it should not be interpreted as the poverty level when the original explanatory variables equal zero.

Beyond the individual coefficient estimates, Table 4 summarises the reported overall model fit and significance.

Table 4. Overall Model Fit and Significance

Indicator	Value
R ²	0.914562
F-statistic	41.28852
Reported probability of F-statistic	0.0000

Source: EViews 13 output.

The R² indicates that the fitted model, including regency fixed effects, accounted for approximately 91.46% of the observed variation in the logarithm of the poverty rate. This explanatory share cannot be attributed exclusively to the three explanatory variables. The reported F-statistic indicates overall model significance, although a separate joint test of the three slope coefficients would be required if the reported test also includes the regency effects.

Taken together, the estimates identify negative and statistically significant associations for GRDP per capita and mean years of schooling, while the association for social assistance expenditure was statistically insignificant.

Discussion

Regional Economic Output and Poverty. The negative association between GRDP per capita and poverty is consistent with the development perspective presented by [Todaro and Smith \(2020\)](#). Expanding productive activity can create employment opportunities and strengthen household earning capacity, providing a potential pathway through which regional economic development contributes to poverty reduction. The estimated relationship supports this theoretical expectation within the study area.

However, GRDP per capita measures regional output relative to population size rather than the income received by individual households. The findings therefore should not be interpreted as evidence that economic gains were distributed equally or that all disadvantaged households benefited from growth. [Ravallion \(2016\)](#) emphasises the importance of distributional conditions in determining the extent to which economic expansion reduces poverty. The negative coefficient is compatible with a poverty-reducing growth pathway, but the present analysis does not identify which sectors, employment arrangements, or household groups transmitted that relationship.

The results also complement the research of [Najib Putri and Yuliana \(2023\)](#), which considers unemployment in the relationship between economic growth and poverty. Employment provides a

plausible connection between aggregate economic activity and household welfare. Nevertheless, unemployment and employment quality were not included in the present model, so this mechanism remains a theoretical interpretation rather than a directly tested explanation.

For regional policy, the findings support attention to productive activities that expand participation among disadvantaged residents. Increasing aggregate output should be accompanied by measures that improve access to employment, enterprise development, and productive infrastructure. The relevant policy objective is to strengthen the opportunities through which households can benefit from regional development.

Educational Attainment and Poverty. The negative association between mean years of schooling and poverty is consistent with human capital theory. Greater educational attainment can improve knowledge, skills, and productive capabilities, potentially strengthening employment prospects and earning capacity. The evidence on returns to educational investment presented by [Psacharopoulos and Patrinos \(2018\)](#) provides a theoretical and empirical basis for this interpretation.

Education may also contribute to poverty reduction through broader capability development. The human development perspective recognises education as a means of expanding informed decision-making and participation in economic and social life ([UNDP, 2024](#)). These pathways suggest that educational attainment can support household resilience beyond its immediate relationship with earnings. However, the study measures average schooling duration and does not directly observe these additional mechanisms.

Although the estimated schooling elasticity was larger in absolute magnitude than the GRDP per capita elasticity, this difference should not be interpreted as establishing education as the more effective policy intervention. The coefficients refer to proportional changes in different variables, whose costs, adjustment periods, and practical feasibility differ. The analysis also does not test whether the coefficients are statistically different from each other.

[Brown et al. \(2020\)](#) caution against assuming that educational investment invariably generates improved economic outcomes. The availability of suitable employment and the relevance of acquired skills influence whether schooling translates into higher earnings. Accordingly, the findings support policies that connect educational access and completion with learning quality and local economic opportunities. Increasing schooling duration alone may provide limited benefits when residents cannot apply their capabilities productively.

Social Assistance Expenditure and Poverty. The statistically insignificant coefficient for social assistance expenditure provides insufficient evidence of a poverty-reducing association within the observed sample and period. This finding does not establish that social assistance was ineffective. An aggregate expenditure measure cannot reveal whether particular programmes protected recipients from deeper deprivation, stabilised consumption, or improved access to essential services.

The welfare-state perspective identifies redistribution and protection against economic insecurity as important functions of public intervention ([Barr, 2020](#); [Papachashvili et al., 2023](#)). These functions may produce benefits that are not fully captured by contemporaneous changes in regional poverty rates. Assistance can support vulnerable households even when the available data do not reveal a statistically significant aggregate relationship.

Several explanations could account for the observed result. Higher expenditure may respond to greater poverty-related needs, generating a positive association through policy responsiveness. Programme benefits may also depend on targeting, coverage, adequacy, and delivery reliability. These possibilities remain untested because the model does not include recipient-level information or implementation indicators. They should therefore guide further investigation rather than be presented as confirmed explanations.

[Ramdani \(2024\)](#) provides a complementary perspective by examining regional subsidies and social assistance expenditure in relation to income inequality. However, inequality and poverty are distinct outcomes, so that study cannot directly validate or contradict the present estimate. The comparison instead highlights the importance of evaluating fiscal redistribution using multiple indicators.

The policy implication is to strengthen the evidence available for programme assessment. Expenditure records should be complemented by information on beneficiary coverage, targeting accuracy, benefit adequacy, and household outcomes. Such information would help distinguish insufficient programme resources from implementation problems and identify benefits that aggregate poverty measures may overlook.

Integrated Implications and Interpretive Limits. The findings support a coordinated approach that connects productive development, education, and social protection. Economic activity can expand

opportunities, education can strengthen residents' capacity to access them, and assistance can protect households facing immediate deprivation. These complementary roles are theoretically plausible, although their interactions were not explicitly tested in this study.

The model's high R^2 should also be interpreted carefully. It includes the contribution of regency fixed effects and does not demonstrate that the three explanatory variables alone account for most poverty variation. Fixed effects address time-invariant regional characteristics, but time-varying influences, common economic shocks, and reverse relationships may remain. The small sample and purposive selection further limit the scope of generalisation.

The study consequently contributes geographically focused evidence rather than a definitive evaluation of policy effectiveness. Future research could examine employment channels, educational quality, assistance implementation, and lagged relationships using broader regional coverage. These extensions would clarify how economic capacity, human capital, and redistribution contribute to poverty outcomes under different local conditions.

Conclusion

This study examined the associations of GRDP per capita, mean years of schooling, and realised social assistance expenditure with poverty in five selected regencies of Lampung Province during 2018–2024. The logarithmic fixed effects estimates showed negative and statistically significant associations for GRDP per capita and mean years of schooling, whereas social assistance expenditure exhibited a positive but statistically insignificant association. The model, including regency fixed effects, explained approximately 91.46% of the variation in the logarithm of poverty rates. These findings support coordinated policies that expand productive employment opportunities, improve educational access and quality, and strengthen social assistance targeting and delivery. The insignificant assistance coefficient does not establish programme ineffectiveness or confirm that expenditure responded to higher poverty; recipient-level and implementation data are needed to assess these explanations. The study is limited by its small sample, purposive selection of five regencies, seven-year observation period, aggregate indicators, and potential omitted variables and reverse causality. Future research should extend geographical and temporal coverage, examine employment and programme implementation mechanisms, and employ specifications that address common time effects, lagged relationships, and endogeneity to strengthen the evidence informing regional poverty reduction.

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