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Analysis of the Influence of Average Years of Schooling, Labor Force Participation, GDP Per Capita and Boss Fund on Poverty In Central Sulawesi

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Abstract
Poverty alleviation in Central Sulawesi Province is still faced with the challenge of spatial disparity between regions even though the aggregate poverty trend continues to show a decline. This study aims to analyze the influence of Average Years of Schooling (RLS), Labor Force Participation Rate (TPAK), Gross Regional Domestic Product (GDP) Per Capita, and School Operational Assistance (BOS) allocation on poverty rates in Central Sulawesi. A quantitative approach with a causal design is used through a panel data method covering 12 districts and 1 city in the 2023-2025 period. Secondary macro data in this study is sourced from official publications of BPS and the Central Sulawesi Provincial Education Office. Hypothesis testing was carried out using Fixed Effect Model (FEM) panel data regression corrected using Driscoll Kraay Standard Errors to overcome violations of autocorrelation assumptions in the model. The results of the estimation prove that RLS, TPAK, and GDP per capita partially have a negative and significant effect on poverty levels. On the other hand, the BOS Fund variables show anomalies in the form of positive and significant influences. In conclusion, improving the quality of human resources, expanding labor participation, and growing regional income are proven to be crucial in reducing the percentage of poor population, while the allocation of BOS funds is more reflective of the affirmative policy function for regions with high poverty rates. The empirical findings of this study contribute to strengthening the application of Amartya Sen's Capability Theory in regional economic evaluation and can be a basis for local governments in evaluating the accuracy of the goals of the education sector social safety net program.

INTRODUCTION

Poverty is a multidimensional phenomenon whose handling is not only limited to meeting material needs, but also expanding access to education and economic resources (Arsyad, 2015). The use of education and income variables in poverty analysis is in line with Amartya Sen's capability theory which emphasizes that education, health, and income are the main pillars in increasing the Human Development Index (HDI) while alleviating poverty. In Central Sulawesi Province, reducing poverty is one of the government's main focuses, where the percentage of poverty was recorded at 10.52 percent in September 2025 (Central Statistics Agency of Central Sulawesi Province, 2025). However, there is inequality between regions, for example, Palu City has a poverty rate of 5.26 percent, inversely proportional to Donggala and Tojo Una-una Regencies which are still above 14 percent. To overcome this structural problem, local governments have rolled out interventions through social welfare programs such as the distribution of School

Operational Assistance (BOS) to reduce the dropout rate which leads to improving the quality of the workforce (Government of the Republic of Indonesia, 2022).

Although interventions through education and social assistance have been carried out, previous literature reviews have shown inconsistent results. Studies conducted by Rossa and Ananda (2024) and Melati, Sudrajat, and Burhany (2021) concluded that increasing education and social assistance budgets are effective and significant in reducing poverty. On the other hand, the research of Rahmayani and Andriyani (2022) found that education assistance does not have a significant effect on poverty if it is not accompanied by an improvement in the quality of life skills relevant to the job market. In addition, most previous studies tend to separate social policy evaluations from macroeconomic indicators such as the Labor Force Participation Rate (TPAK) and regional income (GDP Per Capita). Therefore, there is still a research gap regarding the extent to which government policies interact with indicators of education (Average Years of Schooling), labor absorption (TPAK), and economic growth (GDP Per Capita) in influencing poverty levels at the district/city level.

This research is important to provide an evidence-based policy foundation regarding which determinants have the most significant impact on poverty alleviation at the regional level. This study offers novelty by combining Amartya Sen's theory and real policy instruments through simultaneous analysis of the variables of Average Years of Schooling (RLS), TPAK, GDP Per Capita, and BOS Fund with an econometric model of panel data corrected against autocorrelation assumptions. Based on this background, this study aims to analyze the influence of RLS, TPAK, GDP Per Capita, and BOS Fund allocation on poverty levels in Central Sulawesi Province.

LITERATURE REVIEW

Poverty is essentially a multidimensional problem that is reflected in the inability of individuals and households to meet the most basic living standards, both in the form of food and non-food commodities (Sen, 1999). At the regional level, the evaluation of poverty does not just rely on the indicator of the percentage of the poor population (headcount index / P_0). Furthermore, the Central Statistics Agency (2023) also maps this social dimension through the Poverty Depth Index (P_1) and the Poverty Severity Index (P_2), the gap between village and urban areas, to demographic characteristics and the standard of living of local communities.

The root causes of poverty are greatly influenced by the quality of human resources, macroeconomic conditions, and the accuracy of government policies. Regarding human resource capacity development, the Average Years of Schooling (RLS) indicator and the allocation of the School Operational Assistance Fund (BOS) play a crucial role. Based on the framework of human capital theory, improving the level of education will encourage an increase in individual productivity. Empirical findings confirm that the higher RLS is directly proportional to the decrease in poverty rates, considering that access to better employment and adequate income is increasingly wide open (Muliadi et al., 2020). On the other hand, the distribution of the BOS Fund is present as a support for the burden of education costs that effectively reduces the expenditure of poor families while reducing the risk of child dropouts, which ultimately has a positive impact on reducing regional poverty rates (Puspaningrum & Wardani, 2021).

Meanwhile, from a macroeconomic perspective and employment dynamics, the level of community involvement in economic activities can be reviewed through the Labor Force Participation Rate (TPAK) and the amount of Gross Regional Domestic Product (GDP) per capita. The increase in the value of GDP per capita reflects the growth of a region's economic

output which has the potential to boost purchasing power and overall income of the community (Todaro & Smith, 2015). However, the effectiveness of this growth in poverty alleviation is highly dependent on its capacity to absorb labor. A high TPAK value indicates the dominance of a productively active labor force. If this high participation is supported by the provision of adequate employment, the income level of citizens will increase and the poverty rate can gradually be reduced (Saputra & Pratama, 2022).

RESEARCH METHODS

This study uses a quantitative approach with an explanatory (causal) design to test the direction and magnitude of the influence of free variables on empirically bound variables (Creswell, 2014).

All data used are annual macro secondary data. Data on Poverty Rate, Average Years of Schooling (RLS), Labor Force Participation Rate (TPAK), and Per Capita GDP are sourced from the publication of the Central Statistics Agency (BPS) of Central Sulawesi Province (BPS Central Sulawesi Province, 2025). Meanwhile, the data on the realization of the Middle School Operational Assistance (BOS) funds used in this study were obtained from the Central Sulawesi Provincial Education Office. To minimize the inequality of variance fluctuations and equalize the scale of financial data units with a large nominal value (Rupiah) with the percentage indicator, the BOS fund variable is transformed into a natural logarithm (ln_ BOS). The data collection strategy used is in the form of panel data, which is a combination of spatial dimensions (cross-section) covering 13 administrative areas (12 districts and 1 city) in Central Sulawesi Province, with a time series dimension during the observation period from 2023 to 2025.

The data processing in this study was carried out using R Studio statistical software. To determine the most appropriate and efficient panel data regression estimation model among Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), this study relies on staged testing stages through the Chow Test and the Hausman Test (Basuki & Prawoto, 2016).

After the region-specific estimation (FEM) model was selected, the feasibility of the model was evaluated through a series of classical assumption tests (Widarjono, 2018). This test included the error normality test (Shapiro-Wilk), multicollinearity (Variance Inflation Factor / VIF), heteroscedasticity (Breusch-Pagan), autocorrelation (Breusch-Godfrey), and cross-sectional dependence (CD test). Based on the results of the initial classical assumption test, it was found that there were indications of assumption violations, especially in the problem of autocorrelation (serial correlation in idiosyncratic errors). Therefore, in order to avoid parameter estimation, this study applies the Fixed Effect (FEM) model adjustment method with the Driscoll-Kraay Standard Errors correction method. This method has proven to be robust in overcoming autocorrelation and heteroscedasticity problems simultaneously in panel data econometrics.

The empirical equations of the panel data regression model estimated in this study are formulated as follows:

$$Y_{it} = \alpha_i + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \varepsilon_{it}$$

Description:

Y_{it}	: Poverty Level of district/city in Year t
α_i	: Region-specific effects (individual fixed effect) from the district/city to*i*
$\beta_1, \beta_2, \beta_3, \beta_4$	: The regression coefficient of each variable
$X1_{it}$	: Average Years of Schooling (RLS) from district/city to*i* in the year*t*
$X2_{it}$	: Labor Force Participation Rate (TPAK) of the district/city *i* in the th year
$X3_{it}$	: GDP Per Capita from districts/cities to*i* in the year*t*
$X4_{it}$	: Realization of BOS Funds from districts/cities to*i* in the year*t*
ε_{it}	: Error component (*Error Term*) from the district/city to*i* in the year*t*

i : Number of Regencies from 1, ..., 13
t : Observation Time from 2023-2025

RESULTS AND DISCUSSION

RESULTS

A. Results of Panel Data Regression Model Selection Test

The regression analysis of panel data requires the determination of the most representative estimation model to describe the characteristics of poverty data in 13 districts/cities of Central Sulawesi Province during the period 2023-2025. There are three main approaches in the panel data, namely Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) (Basuki & Prawoto, 2016). To determine the best model, a staged test is carried out using the R Studio software as follows:

1. **Chow Test:** The Chow test is conducted at an early stage to compare the feasibility between the CEM (combined without individual effect) and FEM (taking into account region-specific effects) models.

Table 1. Chow Test Results

Type of Test	Test Statistics	p-value	Verdict
Chow Test	*F-statistic* (, $)df_1 = 12df_2 = 22$	$4{,}718 \times 10^{-13}$	Reject H_0 $()p < 0{,}05$

Source: R Studio Data Processing Results (2026)

Based on Table 1, the probability value (p-value) Chow test of 0.000. Since the value is well below the significance level of 0.05 (α = 5%), the null hypothesis (H0) is rejected. This concludes that the FEM model is better and more appropriate to use compared to the CEM model.

2. **Hausman Test** After the FEM is selected in the first stage, the test is continued with the Hausman Test to compare between FEM and REM.

Table 2. Hausman Test Results

Type of Test	Test Statistics	p-value	Verdict
Hausman Test	*Chi-Square* (df=4)	0,001659	Reject H_0 $()p < 0{,}05$

Source: R Studio Data Processing Results (2026)

The test results show a probability value (p-value) by 0.0016. Considering the value p-value is less than 0.05 (α = 5%), then H0 is rejected. This decision confirms that the FEM model was again selected because it provides a more consistent estimate than the REM model for this study data.

Based on the synthesis of the two tests above, this study definitively uses FEM to analyze the influence of the variables RLS, TPAK, GDP Per Capita, and BOS Fund on poverty levels.

B. Results of Classical Assumption Test and Model Adjustment

After the FEM model is determined, the next crucial step is to evaluate the feasibility of the model through a classical assumption test so that the estimator results are Best Linear Unbiased Estimators (BLUE). The following are the results of checking the classic assumptions carried out:

1. Multicollinearity Test: The results of the analysis showed that the Variance Inflation Factor (VIF) value for all independent variables was in the range of 1.28 to 1.63. Since the value was well below the critical threshold of 10, the regression model was declared free from the

problem of multicollinearity (there is no very strong correlation between independent variables).

2. Cross-Sectional Dependency Test: Through the CD test, a p-value of 0.8351 (> 0.05) was obtained, which indicates that the error between cross-section units is independent and there is no spatial attachment between districts/cities in this model.
3. Heteroscedasticity and Autocorrelation Test: In the heteroscedasticity test (Breusch-Pagan Test), a p-value of 0.1726 (> 0.05) was obtained, which indicates that the assumption of variance diversity is met (no heteroscedasticity). However, in the autocorrelation test using the Breusch-Godfrey Test, a p-value of 0.02122 (< 0.05) was found. This result indicates a violation of the assumption in the form of autocorrelation (inter-time residual correlation) in the basic FEM model.

Given that the basic FEM model is indicated to have autocorrelation problems, the results of the initial estimate cannot be used immediately because it risks producing biased statistical conclusions. As a solution to this econometric problem, the model improvement step (robustness) is applied through R Studio using the Driscoll Kraay Standard Errors method. This correction method is academically recognized as very resilient to overcome the problems of autocorrelation (serial correlation in idiosyncratic errors) and heteroscedasticity in the panel data structure simultaneously (Widarjono, 2018). Through this improvement, parameter estimation becomes valid, reliable, and safe to interpret.

C. Results of Model Parameter Estimation

Based on the FEM approach that has been corrected using Driscoll Kraay Standard Errors, the results of panel data regression modeling to see the influence of the four independent variables on poverty levels are presented in Table 3 below:

Table 3. FEM Panel Regression Estimation Results (Driscoll-Kraay Correction)

Independent Variables	Parameter Coefficients	Standard Error	T-calculated value	p-value	Significance (α = 5%)
X1	-2,8666	0,11144	-25,7239	0,0000	Significant
X2	-0,038555	0,014024	-2,7492	0,0117	Significant
X3	-0,000018534	0,0000014464	-12,8142	0,0000	Significant
X4	8,8478	1,1831	7,4783	0,0000	Significant

Source: R Studio Data Processing Results (2026)

Table 4. Interception Estimation Results (α_i) FEM Panel Regression

No.	Regency/City	Intersep (α_i)
1	Banggai	-176,86
2	Banggai Islands	-163,61
3	Banggai Sea	-158,02
4	Buol	-162,98
5	Donggala	-168,24
6	Morowali	-145,98
7	North Morowali	-158,09
8	Parigi Moutong	-171,08
9	Poso	-164,08
10	Sigi	-166,05
11	Tojo Una Una	-160,47

12	Tolitoli	-165,61
13	Palu City	-172,21

Referring to Tables 3 and 4, all independent variables tested X1, X2, X3 and X4 (RLS, TPAK, GDP Per Capita, and BOS Fund) have a probability value (p-value) below the error tolerance limit of 5 percent or 0.05. This proves that these four variables partially have a statistically significant influence on the fluctuation in poverty levels in Central Sulawesi Province.

DISCUSSION

The Effect of the Average Years of Schooling on Poverty Levels

The data regression analysis of the panel determined that the Average Years of Schooling (RLS) had a negative and statistically significant influence on the percentage of poor people in 13 districts/cities of Central Sulawesi Province. The results of the Fixed Effect Model estimation with the Driscoll-Kraay Standard Errors correction recorded a regression coefficient value for this variable of -2.8666 with a probability value (p-value) of 0.0000. The probability value which is far below the significance threshold of 1 percent (0.01) proves that education is a very strong determinant in suppressing people's economic vulnerability. Mathematically, the coefficient means that every increase in the average duration of education of the community for one year will have implications for a reduction in the poverty rate of 2.8666 percent units, assuming that other variables are constant. Among the independent variables tested, RLS is the instrument that provides the greatest leverage to reduce poverty (in percentage).

This econometric proof is strongly confirmed by the fact of spatial disparity in Central Sulawesi Province. Based on BPS data, the RLS of Central Sulawesi Province in aggregate in 2025 will only reach 9.10 years, which means that the average population has only received education up to the level of 3rd grade of Junior High School (SMP) or grade 1 of Senior High School (SMA). The disparity in the quality of education between regions is very striking and directly proportional to the poverty rate. Palu City as the provincial capital recorded the highest RLS of 11.76 years in 2025, and the success of this education investment is reflected in the poverty level which has been successfully reduced to the lowest level, which is 5.26 percent. On the other hand, areas with challenging topography and limited accessibility such as Donggala Regency and Parigi Moutong Regency only have RLS of 8.01 years and 8.07 years, respectively in 2025. The lack of educational attainment in these two areas is directly correlated with the high absolute poverty burden which reaches 14.66 percent in Donggala and 13.51 percent in Parigi Moutong.

The direction of the consistent negative relationship between the duration of education and poverty is the most obvious representation of the implementation of Human Capital Theory. According to Arsyad (2015), in the framework of contemporary development economics, education is not only seen as the fulfillment of basic social rights, but also as a form of long-term strategic investment. The longer a person stays in formal school, the longer their transition process will be to accumulate technical knowledge, insights, and life skills. Mastering these basic competencies is what boosts people's productive capacity when they enter the job market. This finding is also in line with the human development index approach put forward by Amartya Sen, where education is a crucial pillar that determines a person's capability to free themselves from the snare of underdevelopment.

Adequate intellectual capacity and technical competence are absolute prerequisites for the workforce to penetrate competition in the formal industrial sector. Jobs in the formal sector generally promise wage standards that are above the Regency/City Minimum Wage (MSE) and offer a stable social protection guarantee. On the other hand, individuals who drop out of school or only have low RLS (basic education) tend to be squeezed out of competition and eventually absorbed into the informal sector with minimal and uncertain incomes. Dependence on the informal sector, which is vulnerable to economic shocks, is often the trigger for the cycle of structural poverty (Rahmayani & Andriyani, 2022).

The relevance of these findings is even more crucial when faced with the empirical reality of the dropout rate in Central Sulawesi. The high number of students who graduate without continuing (LTM), especially at the transition level from junior high school to high school, which reaches 10,840 students in 2026, is the main reason why it is difficult for RLS in poverty pockets to rise. Many young workers are forced to make a living in the community without the provision of relevant secondary competence skills. Therefore, in line with the findings of previous research (Tjiabrata et al., 2021; Dama & Syari'udin, 2022), progressive local government intervention to prevent children from dropping out of school until they complete high school education (12 years) is the most rational structural intervention strategy to permanently eliminate extreme poverty across generations.

The Effect of Labor Force Participation Rate on Poverty Levels

Based on the results of the Fixed Effect Model panel data regression estimation with Driscoll Kraay Standard Errors correction, the Labor Force Participation Rate (TPAK) variable was proven to have a negative and significant influence on the poverty level in 13 districts/cities of Central Sulawesi Province. The value of the regression coefficient for this variable was recorded at -0.0386 with a probability (p-value) of 0.0117, which is below the significance level of 5 percent (0.05). Empirically, this figure means that any increase in labor force participation of 1 percent will be accompanied by a decrease in the poverty rate of 0.0386 percent, assuming other factors are constant (ceteris paribus).

These econometric findings are very much in line with the actual macroeconomic data trends in Central Sulawesi Province. Based on the publication of the Central Statistics Agency (BPS), the average TPAK in Central Sulawesi Province continues to show a positive trend in the last three years, namely increasing from 69.85 percent in 2023, to 71.10 percent in 2024, and touching 72.40 percent in 2025. In line with the increasing trend of work participation, the aggregate poverty rate in this region actually recorded a consistent decline from 12.41 percent in 2023 to 10.92 percent in 2025. In fact, areas with a very high TPAK rate in 2025, such as Parigi Moutong Regency (76.58 percent) and Sigi Regency (76.03 percent), show a movement in the percentage of poor people that gradually decreases steadily in each year of observation. This phenomenon proves that the increase in labor absorption actually acts as a safety valve in reducing the number of underprivileged populations.

In the perspective of development economic theory, the rationalization of this negative relationship rests on the function of the labor market as the main mechanism of income distribution (Arsyad, 2015). The Labor Force Participation Rate is the main indicator that measures the proportion of the working-age population (15 years and above) who are economically active, both those who are currently working and those who are actively looking for work (Kuncoro, 2010). The higher the percentage of TPAK in a district or city, the greater the proportion of people of productive age who are able to generate independent income. Active involvement in this labor market breaks the cycle of economic dependence in families, minimizes *the dependency ratio*, and increases household purchasing power in aggregate. This increase in purchasing power will ultimately raise the status of household consumption expenditure to get out of the absolute poverty line.

Furthermore, these empirical findings reinforce the significance of the employment dimension in the framework of poverty alleviation as emphasized in previous studies. When the labor force successfully enters the labor market, they not only earn wages, but also expand their economic capabilities to fulfill more deserving basic rights (education, health, and housing). In the Central Sulawesi region which has a challenging topography and a wide distribution of population, expanding access to employment opportunities is a very vital instrument (Kuncoro, 2018).

Although the increase in TPAK has been shown to significantly reduce poverty rates, the policy implications of these findings demand extra attention from local governments. Sustainable poverty alleviation not only encourages the labor force to participate (quantity), but also demands

the availability of quality jobs. If the increase in TPAK is only filled by workers who are forced to enter the informal sector without adequate skills, vulnerable communities are vulnerable to dependence on low wages (Rahmayani & Andriyani, 2022). Therefore, reducing poverty rates through the TPAK pathway will achieve maximum effectiveness when balanced with the provision of jobs in the formal industrial sector that offers income stability and social protection guarantees for its workers.

The Effect of Per Capita GDP on Poverty Levels

Based on the results of the regression statistical test of the panel data, the Gross Regional Domestic Product (GDP) Per Capita variable recorded a regression coefficient of -0.0000185 with a very significant probability (p-value) of 0.0000 (far below the significance level of 1 percent or 0.01). This figure indicates a negative and partially significant influence between the GDP Per Capita and the poverty level in Central Sulawesi Province. Mathematically, any increase in GDP Per Capita will be accompanied by a decrease in the percentage of poverty, assuming other variables are in a constant state. The value of the coefficient that seems very small nominally (being in a long decimal fraction) is econometrically reasonable. This condition is solely due to the difference in the structure of the unit of measurement, where GDP Per Capita is measured in a very large amount of currency (Rupiah), while the poverty rate is measured in the form of small-scale percentages.

The consistency of the direction of this negative relationship is very clearly illustrated in the macroeconomic empirical data of Central Sulawesi Province. Based on BPS data, the average GDP Per Capita of Central Sulawesi Province has experienced an impressive growth trend over the past three years, which increased from IDR 112.46 million in 2023 to IDR 120.75 million in 2024, and touched IDR 131.64 million in 2025. The drastic increase in the amount of this regional "economic cake" in aggregate proved to be equivalent to the government's success in reducing the number of poor people from 12.41 percent to 10.92 percent in the same period. Central government areas such as Palu City, which has a relatively stable and high GDP per capita (reaching IDR 88.38 million in 2025), have succeeded in reducing the poverty rate to become the lowest in the province, which is 5.26 percent. On the other hand, areas with GDP per capita that are included in the lowest group, such as Tojo Una-Una Regency (IDR 46.55 million in 2025), are consistently contributing to the highest percentage of poor people (14.67 percent).

This phenomenon is very much in line with the economic pillar in the Capability Approach initiated by the Nobel laureate in Economics, Amartya Sen. In Sen's view, poverty is basically the deprivation of basic freedoms or a person's inability to meet a decent standard of living (Sen, 1999). GDP Per Capita is a reflection of the average income earned by each resident in a region (Sukirno, 2016). When GDP Per Capita increases in real terms, this represents an increase in purchasing power or an expansion of people's financial capabilities to reach the fulfillment of minimum basic physical needs, such as nutritious food (2,100 kcal per day), clothing, housing, and access to basic health services. The greater the purchasing power they have, the greater the probability of the household to raise its consumption expenditure beyond the absolute poverty line set by BPS (Arsyad, 2015).

Nevertheless, there are important notes that must be underlined from the constellation of Central Sulawesi's economic data related to the phenomenon of structural disparity. Morowali Regency, for example, recorded an anomaly in wealth distribution. In 2025, Morowali's GDP per capita will explode extraordinarily to touch Rp1.07 billion per person per year, making it the "richest" area statistically due to the downstreaming of the nickel industry. But ironically, the poverty rate in Morowali in 2025 is still held at double-digits (10.38 percent).

This confirms Kuncoro's (2010) view of the dichotomy between growth and distribution. This finding provides a strong policy signal that relying on an increase in aggregate GDP alone is not enough (Kuncoro, 2010). An increase in GDP driven by capital-intensive sectors such as mining will not automatically trickle-down effect perfectly if it is not accompanied by affirmative

policies. Therefore, poverty alleviation in the future does not only focus on how much GDP a district/city is able to produce, but also how inclusive the money turnover is able to touch the lower class of society, especially through the creation of business fields and the protection of vulnerable groups.

The Effect of School Operational Assistance (BOS Fund) on Poverty Levels

In contrast to the three previous macroeconomic variables that showed a negative direction, the results of the panel data regression estimation for the social welfare program variable represented by the natural logarithmic value of the realization of the School Operational Assistance Fund actually showed a theoretical anomalous result. This variable recorded a positive regression coefficient of 8.8478 with a probability level (p-value) of 0.0000. Mathematically, this indicates that the increase in the allocation of the BOS Fund is statistically consistent with the increase in the percentage of poverty in 13 districts/cities of Central Sulawesi Province. This finding automatically rejects the hypothesis that projects that the BOS Fund will have an immediate negative effect on poverty.

Nevertheless, the direction of this significant positive relationship should not be misinterpreted as the distribution of BOS Fund subsidies as a causal factor in the increase in the number of poor people. This statistical anomaly reveals the complex structural, regulatory, and methodological dynamics in the distribution of social safety net funds in Central Sulawesi. Empirically, this phenomenon can be explained through four main rationalizations:

First, the characteristics of affirmative policies (targeting policy). This positive relationship reflects the government's affirmative policy response. Social safety net instruments (such as BOS) are indeed allocated more massively to areas with a high absolute poverty base and a large school-age population that is prone to dropping out of school. Districts with high poverty rates such as Parigi Moutong (13.51 percent in 2025) are recorded to receive an allocation of BOS funds reaching Rp27.78 billion, which is one of the highest absorptions in the province. On the other hand, areas with low poverty rates such as Palu City (5.26 percent) have education financing dynamics that are also supported by the economic independence of their citizens. Therefore, areas with swollen poverty will automatically record high absorption of BOS funds as well, which ultimately leads to a positive correlation in the results of econometric data processing.

Second, the time lag effect of education investment. There is a long time lag between the receipt of education subsidies and its impact on alleviating household economic poverty. BOS funds at the secondary education level are indeed effectively designed to alleviate school costs and prevent students from dropping out of school (Putra & Anzaikhan, 2022). However, the prevention of today's dropout rate will not necessarily change the economic status and income of poor families in the same year. These high school graduates can only make an economic contribution to their families if they have been absorbed by the formal job market in the future. This condition is exacerbated by the high rate of Graduation Not Continuing (LTM) in Central Sulawesi, which makes many graduates vulnerable to being absorbed into the low-wage informal sector even though their secondary education costs have been subsidized by the government. This is in line with the findings of Rahmayani and Andriyani (2022) who emphasized that providing access to education funding will not have an immediate impact on poverty reduction if it is not aligned with job creation.

Third, the limitation of the scope of the analysis data. This anomaly is also greatly influenced by the limitation of spatial data coverage in the modeling. The BOS Fund realization figure used in this study (around a total of Rp240.5 billion in 2025) only represents the disbursement of funds for the secondary education level (high school, vocational, and SLB) which is regulated by the provincial government. On the other hand, the demographic pyramid of the underprivileged population generally has a much more massive burden on elementary school and junior high school (SMP) age children. The absence of basic education fund allocation data that is

the authority of the district/city government causes the total effect of reducing the burden of expenditure on poor households not to be fully captured by the regression model of this study.

Fourth, strict restrictions on the use of aid funds. This indirect relationship is very relevant to the pattern of restricting regulations on the use of education funds. Based on the Regulation of the Minister of Primary and Secondary Education Number 8 of 2025, the BOSP Fund is specifically determined purely to support non-personnel operational costs for educational units (institutions). In line with this, the Governor of Central Sulawesi Regulation Number 20 of 2025 limits the use of the BOSDA Fund only to the fulfillment of the school managerial and administrative system (such as the maintenance of facilities or learning operations). These two regulations explicitly prohibit the use of funds to finance the personal consumption needs of poor students (such as uniforms, shoes, transportation costs, or cash transfers). Since these funds do not drip directly into the pockets of poor households to cover their daily consumption needs, the impact on the movement of the absolute Poverty Line methodologically measured by BPS based on the level of real household consumption expenditure will not be visible or detected in the short term.

Overall, this anomalous analysis proves that the operational fund of secondary education functions essentially as a guardian of the survivability of secondary school institutions so that they continue to operate in an inclusive manner, not as an instrument of direct economic cash assistance for households. Therefore, in order for the function of social welfare funds in the education sector to be in line with the mandate of Presidential Instruction Number 4 of 2022 concerning the Acceleration of the Elimination of Extreme Poverty, the operational subsidy policy of school institutions needs to be integrated with other social protection instruments (such as the Family Hope Program/PKH) which directly touch the instant increase in the purchasing power of student families.

CONCLUSION

Based on the formulation of the problem, the results of statistical testing, and the discussion that has been described, this study produces conclusions that directly answer the purpose of the study. Average Years of Schooling (RLS), Labor Force Participation Rate (TPAK), and Per Capita GDP have been proven to have a negative and significant influence on the poverty rate in 13 districts/cities of Central Sulawesi Province. This confirms that increasing the duration of formal education, optimizing labor force absorption, and inclusive regional income growth are the main pillars that are very effective in alleviating people from the poverty line. On the other hand, the variables of realization of the Middle School Operational Assistance Fund (BOS) show a positive and significant influence on the poverty level. The anomalous direction of this relationship does not indicate that the BOS Fund causes poverty, but rather reflects the nature of the affirmation policy targeting poverty pockets, the existence of a *time lag* before graduates enter the job market, and strict regulatory restrictions that prohibit the use of the funds for the direct consumption needs of poor students.

Conceptually, this research provides an empirical contribution that strengthens Amartya Sen's Capability Theory in the context of regional economic development in Central Sulawesi. This research proves that the alleviation of structural poverty is not enough to be solved by boosting economic aggregate through capital-intensive sectors, but rather demands the expansion of basic community capabilities through human capital investment (education) and certainty of job market access. In the future, the implications of these findings require the Central Sulawesi Provincial Government not only to rely on managerial subsidies for school operations, but to align them with social protection programs that stimulate the daily purchasing power of households, as well as ensure the compatibility between the educational curriculum and the needs of formal industrial absorption.

This research has limitations, especially in the scope of spatial data and the regulation of policy instruments. The School Operational Assistance data used is purely sourced from the allocation of secondary education levels (SMA, SMK, and SLB) which are under the authority of the provincial government. Therefore, for academics or researchers, it is highly recommended to expand the research model by integrating the aggregate BOS funds of the primary education level (elementary and junior high) managed by districts/cities so that the portrait of the reduction of household expenditure burden can be recorded more completely. In addition, the addition of specific macroeconomic control variables, such as open unemployment rates or the realization of village funds, can be considered to enrich the analysis of the effectiveness of poverty alleviation policies in the future.

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