



Impact of Gini Ratio, Economic Growth and Unemployment on Poverty Levels: A Panel Data Analysis

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ABSTRACT

Despite consistently higher economic growth in Central Sulawesi compared to the national average, the region continues to exhibit a higher poverty rate than the national level. This study examines the effects of income distribution, economic growth, and the open unemployment rate on poverty levels across districts and cities in Central Sulawesi following the 2018 disaster caused by the earthquake and tsunami. The variables used in the study include the poverty rate as the dependent variable and the Gini ratio, economic growth, and open unemployment rate as the independent variables, based on a sample from 13 regions over 5 years (2019-2023), totaling 65 observations. Using secondary data obtained from the Central Statistics Agency of Central Sulawesi Province, the study employs a panel data regression method. The findings reveal that, collectively, income distribution, economic growth, and the open unemployment rate significantly influence poverty levels. However, a partial analysis indicates that while the Gini ratio and the open unemployment rate have significant impacts, economic growth does not significantly affect poverty levels. These results provide insights into the economic dynamics of Central Sulawesi and offer a foundation for targeted poverty alleviation strategies in post-disaster contexts.

Keywords: Income Distribution, Economic Growth, Open Unemployment, Poverty Levels, Economic Analysis

JEL Classifications: I32, O15, C33

1. INTRODUCTION

Poverty remains a prevalent issue in most developing countries, arising from the inability of certain segments of society to maintain a standard of living deemed adequate. In Central Sulawesi, the poverty rate has remained persistently high, even 5 years after the catastrophic earthquake, tsunami, and liquefaction that occurred on September 28, 2018 (Tope et al., 2022). In 2019, the poverty rate in Central Sulawesi was 13.48%, decreasing to 12.92% in 2020, rising slightly to 13.00% in 2021, declining to 12.33% in 2022, and marginally increasing to 12.41% in 2023. By comparison, Indonesia's national poverty rate was 9.41% in 2019, 9.78% in 2020, 10.14% in 2021, 9.54% in 2022, and 9.36% in 2023.

Income inequality is a significant factor contributing to poverty. In Central Sulawesi, the Gini Ratio was recorded at 0.327 in 2019 and decreased to 0.304 in 2023 (Statistics Indonesia, 2024). Unequal

income distribution exacerbates income inequality, which serves as a fundamental driver of poverty (Suzumura, 2022). This issue is prevalent in both developed and developing countries and warrants further investigation (Suparman and Muzakir, 2023; Astuti et al., 2022; Rauf et al., 2022; Husnah et al., 2023). Economic development often benefits only a small portion of the population, intensifying income inequality. Moreover, a substantial segment of society lacks access to the advantages of economic progress, further perpetuating inequality (Ragkousis, 2024).

Economic growth plays a critical role in poverty reduction (Yamamori, 2019). However, sustained economic growth over a certain period does not necessarily ensure regional stability. In Central Sulawesi, economic growth was recorded at 8.83% in 2019, declined to 4.86% in 2020, rose to 11.68% in 2021, and peaked at 15.22% in 2022 before slightly decreasing to 11.91% in 2023. By contrast, Indonesia's national economic growth was

5.02% in 2019, contracted to -2.07% in 2020 due to the COVID-19 pandemic, and recovered to 3.70% in 2021, 5.31% in 2022, and 5.05% in 2023 (Statistics Indonesia, 2024).

From a macroeconomic perspective, economic growth refers to an increase in Gross Domestic Product (GDP), which reflects a rise in income. Economic development is deemed successful when real income increases sustainably without a corresponding rise in poverty levels. Effective poverty alleviation requires quality economic growth, characterized by inclusivity and support for the broader population (Subkhan and Hutajulu, 2023; Husnah and Ichwan, 2023; Pamela and Indrawati, 2022). Growth in the agricultural sector, in particular, has been shown to significantly reduce poverty due to its strong impact on the livelihoods of low-income groups (Yang and Zhong, 2022).

Poverty can also result from insufficient employment opportunities or an oversupply of labor, leading to low incomes due to the lack of available jobs. In Central Sulawesi, the Open Unemployment Rate was recorded at 3.11% in 2019 and decreased slightly to 2.95% in 2023 (Statistics Indonesia, 2024). An individual is classified as unemployed if they are not engaged in any form of work, are actively seeking employment, and are ready to work but unable to find a job. Unemployment directly contributes to poverty, as individuals without work have no income to meet their basic needs. When these needs are unmet, individuals fall below the poverty threshold (Li et al., 2021). The correlation between unemployment and poverty is particularly important in understanding the socio-economic challenges faced by Central Sulawesi. High unemployment exacerbates income inequality and hinders economic growth, leading to a vicious cycle that perpetuates poverty. Despite some improvements in the unemployment rate, the region continues to grapple with income disparity and inadequate job opportunities, which restrict the potential for poverty alleviation. Therefore, analyzing the interplay between these factors is critical for identifying effective policy measures that can address the root causes of poverty. This study aims to investigate the impact of income distribution, economic growth, and the open unemployment rate on poverty levels in districts and cities across Central Sulawesi.

2. LITERATURE REVIEW

Poverty remains a fundamental challenge faced by nearly all nations, encompassing the inability to meet basic human needs. Individuals are considered impoverished due to insufficient income and assets required to fulfill essential food and non-food necessities. Schmidt (2023) defines poverty as a condition where individuals live below an established standard, marked by limited access to food, clean water, sanitation, healthcare, education, and information. The root causes of poverty may also include geographical, demographic, ethnic, racial, and familial factors (Saddique et al., 2023). Additionally, the frequency and intensity of natural disasters, such as earthquakes, hinder asset accumulation and exacerbate poverty levels. The Central Statistics Agency defines poverty using the basic needs approach, which considers economic incapacity to meet minimum food and non-food requirements. Under this framework, individuals are classified as

poor if their average monthly per capita expenditure falls below the poverty line.

Poverty, as described by Bagchi (2023), arises from the failure of the economic system to make automatic adjustments between public consumption and production, leading to inequalities that marginalize specific groups. Saith (2023) argued that government intervention in regulating and directing economic activities is essential for guiding societies toward prosperity. The pro-growth, pro-job, and pro-poor development strategies adopted by various countries, including Indonesia, are designed not only to stimulate economic growth but also to reduce unemployment and address income disparities. Ultimately, these strategies aim to decrease the number of individuals living in poverty (Taylor, 2023).

Sihombing and Arsani (2021) found that, although Indonesia's poverty rate has been decreasing over time, the pace of decline has slowed, consistent with the law of diminishing returns. Several factors, including the Human Development Index, Gini Ratio, and Open Unemployment Rate, influence poverty. Their study employed both static and dynamic panel data modeling to analyze poverty in Indonesia from 2012 to 2019, examining the relationships between the Human Development Index, Gini Ratio, and Open Unemployment Rate with poverty. The Gini Ratio was found to have a significant and positive relationship with poverty, while the Human Development Index showed a significant negative relationship with poverty. However, there was insufficient evidence to suggest that unemployment directly affected poverty. It clearly expresses the expected relationship between income inequality (measured by the Gini ratio) and poverty levels, suggesting that as income inequality increases, poverty levels are also expected to rise. This hypothesis aligns with common economic theory, which suggests that greater income inequality can lead to higher poverty due to unequal distribution of resources.

Nabila (2021) conducted a study examining the relationship between Gross Regional Domestic Product (GRDP), the Human Development Index (HDI), unemployment, and poverty in Indonesia. The study utilized cross-sectional data from 34 provinces across the country. The findings indicated that the Human Development Index had a negative impact on poverty, while Gross Regional Domestic Product and unemployment did not significantly affect poverty levels. Moreover, Ifa and Al Maidah (2023) investigated the impact of economic growth, education, and health on poverty in East Java Province. They concluded that economic growth, education, and health significantly influenced poverty. Similarly, Mahaputra et al. (2023) examined the effects of economic growth, education level, and unemployment on poverty in West Sumatra. Their descriptive and associative study, which utilized secondary data, revealed that economic growth and education level both had a negative and significant impact on poverty, while unemployment had a positive but insignificant effect on poverty. Based on the introduction and the context of the study, the following hypotheses can be proposed:

- H_1 : A higher Gini ratio (income inequality) has a significant positive effect on poverty levels.
- H_2 : Economic growth has a significant and negative effect on poverty levels.

- H_3 : The open unemployment rate has a significant and positive effect on poverty levels.

3. RESEARCH METHOD

This study analyzes the factors influencing poverty in regencies and cities in Central Sulawesi following natural disasters. The research is quantitative and associative in nature. The population consists of data from 2019 to 2023 for 12 regencies and 1 city in Central Sulawesi. Data sources are obtained from the Central Sulawesi Statistics Agency. The independent variables include the Gini Ratio (X1), Economic Growth (X2), and Open Unemployment Rate (X3) for the regencies and cities in Central Sulawesi. The dependent variable (Y) is the Poverty Rate in these areas (Table 1). The study employs panel data regression, combining time-series and cross-sectional data, analyzed using EViews 10 software. Classical assumption tests are conducted to ensure normal distribution of the data and confirm that there are no signs of heteroscedasticity, autocorrelation, or multicollinearity.

Multiple regression analysis is employed to assess the overall effect of the independent variables on the dependent variable. Hypothesis testing is conducted both simultaneously and partially. Simultaneous hypothesis testing aims to determine whether the Gini Ratio, Economic Growth, and Open Unemployment Rate collectively have a significant effect on poverty in regencies and cities in Central Sulawesi following the natural disaster. Partial hypothesis testing seeks to examine whether each independent variable—Gini Ratio, Economic Growth, and Open Unemployment Rate—individually has a significant impact on poverty in these areas.

To ensure clarity and avoid misinterpretation, the key terms in this study are clearly defined. Income inequality (X1) is measured using the Gini Ratio, which ranges from 0 to 1. Economic growth (X2) refers to the annual percentage change in the economy within regencies and cities in Central Sulawesi, expressed as a percentage. The Open Unemployment Rate (X3) is the ratio of the unemployed population to the total labor force in the regencies and cities, also expressed as a percentage. The Poverty Rate (Y) is calculated by dividing the number of individuals living below the poverty line in regencies and cities in Central Sulawesi by the total population during the same time period, also expressed as a percentage of the total population.

4. RESULTS

Table 2 presents the data processing results through EViews, showing the linear estimation of the factors influencing poverty in Central Sulawesi, with a focus on the Gini ratio, economic growth, and the open unemployment rate from 2019 to 2023. The dependent variable is the poverty rate.

The regression analysis shows that the constant, as the intercept term, has a value of 9.582648, with a t-statistic of 8.619542 and a highly significant $P = 0.0000$, indicating that the constant term is statistically significant in explaining the poverty levels in the

region. The Gini ratio has a positive coefficient of 11.28410, which is significant at the 1% level, with a t-statistic of 2.781424 and a $P = 0.0077$. This indicates that greater income inequality (higher Gini ratio) significantly contributes to higher poverty levels in the regencies/cities of Central Sulawesi. The coefficient for economic growth is 0.004435, with a t-statistic of 0.250618 and a $P = 0.8032$, suggesting that economic growth does not have a statistically significant effect on poverty reduction in the region. Lastly, the open unemployment rate has a positive coefficient of 0.156943, with a t-statistic of 2.025679 and a $P = 0.0483$, which is significant at the 5% level, indicating that higher unemployment rates are associated with higher poverty levels in the region.

Table 3 presents the effects specification of cross-section fixed variables, showing various key statistics that help assess the model's goodness-of-fit. The R-squared value of 0.984777 indicates that approximately 98.48% of the variability in the dependent variable (poverty levels) can be explained by the independent variables included in the model. The adjusted R-squared of 0.980117 reflects a high level of explanatory power, even after adjusting for the number of predictors. The standard error of regression (S.E. of regression) is 0.578255, which suggests that the model's predictions are reasonably close to the observed data. In addition, the F-statistic value of 211.3246 with a corresponding $P = 0.000000$ indicates that the overall model is statistically significant at a very high confidence level, confirming that the independent variables collectively have a meaningful impact on poverty in the regencies/cities of Central Sulawesi. The Durbin-Watson statistic of 1.861985 suggests no significant

Table 1: Variable and sample

Dependent variable	Poverty rate
Independent Variable	Gini Ratio (X1), Economic Growth (X2), and Open Unemployment Rate (X3)
Method	Pooled EGLS (Cross-section weight)
Sample	2019-2023
Included observations	5 (years)
Cross-sections included	13
Total pool (balanced) observations	65

Source: Research data, 2024

Table 2: Linear estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	9.582648	1.111735	8.619542	0.0000
Gini Ration	11.28410	4.056950	2.781424	0.0077
Economic growth	0.004435	0.017698	0.250618	0.8032
Open Employment Rate	0.156943	0.077477	2.025679	0.0483

Source: Research data, 2024

Table 3: Effects specification of cross-section fixed variables

Weighted Statistics	Value	Weighted Statistics	Value
R-squared	0.984777	Mean dependent var	15.54156
Adjusted R-squared	0.980117	S.D. dependent var	6.202128
S.E. of regression	0.578255	Sum squared resid	16.38457
F-statistic	211.3246	Durbin-Watson stat	1.861985
Prob (F-statistic)	0.000000		

Source: Research data, 2024

autocorrelation in the residuals, supporting the reliability of the regression results. The mean dependent variable is 15.54156, while the standard deviation is 6.202128, providing insight into the distribution of poverty rates across the regions studied. The sum of squared residuals is 16.38457, further emphasizing the model's fit.

Table 4 presents the effects specification of unweighted statistics, providing additional insights into the regression model's performance without weighting the cross-sectional data. The R-squared value of 0.969346 indicates that the independent variables explain approximately 96.93% of the variability in the dependent variable (poverty levels). This suggests a very strong explanatory power for the model, even when not accounting for any weighting of the data. The sum of squared residuals is 17.92334, which reflects the total squared differences between the observed and predicted values, indicating the degree of fit of the model to the data. The Durbin-Watson statistic of 1.352173 suggests the presence of potential positive autocorrelation in the residuals, which could indicate some model specification issues or unaccounted-for time-based patterns in the data. The mean dependent variable of 13.33985 indicates the average poverty level across the regions, while the lack of significant variability (reflected in the sum squared residuals) suggests that, although the model explains a high proportion of variation, there may still be some underlying factors influencing poverty levels that are not fully captured by the model.

Overall, the findings of this regression analysis offer valuable insights into the factors influencing poverty levels in Central Sulawesi, with specific implications for policy and economic development strategies. The highly significant constant term suggests that, even without the explanatory variables, there is an underlying level of poverty that is influenced by other unmeasured factors. This finding highlights the importance of addressing broader socio-economic conditions in the region that contribute to persistent poverty, such as access to education, healthcare, and social services.

The significant positive relationship between the Gini ratio and poverty levels emphasizes the critical role of income inequality in exacerbating poverty. This suggests that policy interventions aimed at reducing income disparity, such as progressive taxation, improved social welfare programs, and targeted economic initiatives for marginalized communities, are essential for alleviating poverty in Central Sulawesi. By addressing income inequality, the region could create a more equitable distribution of wealth, which in turn could help reduce poverty levels.

Conversely, the lack of a statistically significant relationship between economic growth and poverty reduction implies that the current growth in Central Sulawesi is not benefiting all segments of the population equally. Economic growth in the region may

be concentrated in sectors that do not sufficiently impact the lower-income groups, such as the mining and industrial sectors, which primarily benefit the middle- and high-income groups. Policymakers in Central Sulawesi need to prioritize inclusive growth strategies that ensure the benefits of economic expansion are distributed more equitably, with a focus on sectors that can create jobs for lower-income communities.

Finally, the positive and significant association between the open unemployment rate and poverty underscores the importance of creating more job opportunities in Central Sulawesi. Policies focused on reducing unemployment, particularly through skill development programs and support for small- and medium-sized enterprises, can help alleviate poverty by enabling individuals to earn stable incomes and improve their standard of living. Expanding access to education and vocational training will further enhance employability and empower the workforce to contribute more effectively to the region's economic development.

5. DISCUSSION

The results show that the Gini Ratio has an influence on poverty levels in regencies and cities in Central Sulawesi. The findings indicate that a higher Gini Ratio, representing greater income inequality, is linked to a higher percentage of the poor population. Conversely, a lower Gini Ratio, indicating more equitable income distribution, corresponds to a lower percentage of poverty in the region. This relationship is attributed to various social assistance policies from both central and local governments, which aim to mitigate the decline in purchasing power, particularly for low-income communities affected by natural disasters and the Covid-19 pandemic (Kurniawan et al., 2021).

Research on social assistance in Central Sulawesi by Haksama et al. (2022) and Opabola and Galasso (2024) found that social assistance programs targeted at household empowerment after the disaster and during the pandemic improved income distribution, thus reducing poverty. This was made possible by well-targeted and effectively managed programs supported by proper regulations. Furthermore, development policies and equitable infrastructure distribution have improved access to the economy for impoverished populations, thereby increasing their opportunities for greater productivity. These findings align with Handayani et al. (2021), who emphasized the importance of infrastructure in alleviating poverty in Central Sulawesi.

The research findings suggest that economic growth in the regencies and cities of Central Sulawesi does not have a significant partial effect on reducing poverty rates. The ability of economic growth to improve individual welfare depends on how proportionally its benefits are distributed, especially among the poor (Pham et al., 2024; Alekhina and Ganelli, 2023). Economic growth in Central Sulawesi has been of low quality and has failed to effectively reduce poverty. The benefits of regional economic growth have primarily been enjoyed by middle- to upper-income groups, leaving lower-income groups, particularly the poor, largely unaffected.

Table 4: Effects specification of unweighted statistics

Estimation	Value	Estimation	Value
R-squared	0.969346	Mean dependent var	13.33985
Sum squared resid.	17.92334	Durbin-Watson stat	1.352173

Source: Research data, 2024

The economic growth in Central Sulawesi has been mainly driven by the mining, quarrying, and processing industries in Morowali and North Morowali Regencies, which predominantly benefit high-income groups (Choi and Kim, 2023). These sectors are capital-intensive and rely heavily on advanced technology, resulting in limited impact on poverty reduction. In contrast, the agricultural sector, which is labor-intensive and relies on unskilled workers, has grown at a slower pace. Among all industries, agriculture is the most effective at reducing poverty due to its labor-intensive nature (Rasul et al., 2021).

The study also reveals that the Open Unemployment Rate has a positive and significant impact on poverty levels in Central Sulawesi's regencies and cities from 2019 to 2023. As unemployment rises, the number of people living in poverty also increases. This finding is consistent with the research by Utami et al. (2023), which indicates that an increase in unemployment inevitably raises poverty levels. Unemployed individuals lack income, despite having numerous needs, particularly for basic necessities. When people are unemployed, they are unable to meet their needs, which pushes them into poverty. If job opportunities remain unavailable, individuals will continue to face a state of waiting to find work, thus categorizing them as part of the open unemployment group. High unemployment not only escalates the number of poor people but also leads to economic and social instability. This instability adversely affects political and social stability, ultimately hindering long-term economic development (Hatmaja and Fuddin, 2023).

6. CONCLUSION

The research findings indicate that, on a simultaneous basis, the variables of Gini ratio, economic growth, and open unemployment rate significantly influence poverty in the regencies and cities of Central Sulawesi. However, when examined individually, the Gini ratio is found to have a significant impact on poverty, while economic growth does not show a significant effect. On the other hand, the open unemployment rate is shown to have a significant influence on poverty. These findings suggest that income inequality, unemployment, and unequal economic growth contribute substantially to the poverty levels in the region.

To effectively reduce poverty in the future, the regional government should prioritize inclusive development strategies. Currently, economic growth in the region primarily benefits middle- and high-income groups, while low-income groups have not experienced the positive effects. This disparity highlights the need for policies that promote equitable access to resources and opportunities for all citizens, particularly marginalized communities. Expanding job opportunities is a crucial factor in stimulating economic growth that benefits all segments of society, including the poor. Providing access to affordable education and skills development can also increase employability, enabling individuals to secure better-paying jobs and thus improve their standard of living. Additionally, efforts should be made to enhance the income distribution system, ensuring that the benefits of economic growth are spread more evenly across different income groups.

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