# The Effect of Government Expenditure in Education, Health, and Infrastructure on Poverty: A Panel Data Approach of Regencies/ Cities in North Sulawesi Province

*Eva Nur Kumalasari*

*Department of Economics, Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia*

E-mail: evanurkumala@gmail.com

## ARTICLE INFO

## ABSTRACT

Reducing poverty stands as a key objective in national development efforts. Governments have an essential function in lowering poverty rates by strategically distributing budget resources across critical areas including education, healthcare, and infrastructure development. This research examines how government spending in educational, healthcare, and infrastructure sectors influences poverty levels using panel data analysis from districts and municipalities in North Sulawesi Province between 2011 and 2020. The analysis employs a Random Effect Model methodology. The findings reveal that government investment in education and healthcare sectors significantly reduces poverty levels, whereas infrastructure spending paradoxically shows a significant positive correlation with poverty rates in North Sulawesi's districts and municipalities.

Keywords: Government Expenditure, Education, Health, Infrastructure, Poverty, Panel Data

## 1. INTRODUCTION

Poverty is a global phenomenon that is still a major challenge in economic development that occurs in many countries. The issue of poverty in a nation is multifaceted as it not only pertains to diminished financial resources but also signifies an individual's struggle to access fundamental necessities like schooling, healthcare, shelter, attire, and nourishment (Fithri & Kaluge, 2017). Poverty can be understood from two main perspectives. First, absolute poverty, which is an approach that identifies the number of people living below a certain poverty line threshold. In this case, poverty is determined by the inability of individuals to meet minimum basic needs (Hasyim, 2017). Second, relative poverty, which refers to the proportion of national income received by each income group. This type of poverty reflects a person's inability to achieve the prevailing standard of living in their society, so it is closely related to the issue of income distribution (Kuncoro, 2018).

Poverty remains a persistent challenge in Indonesia year after year due to its complex, multifaceted nature that requires collaborative efforts beyond just central government intervention which local governments must also take active responsibility. Following Indonesia's decentralization policy established through regional government legislation (Law Number 32 of 2004) and laws governing fiscal balance between national and regional authorities, local governments are expected to assume expanded roles and responsibilities in combating poverty. This enhanced local involvement ensures that anti-poverty programs and approaches are more precisely tailored and effectively targeted to address specific regional needs.

One of the regions in Indonesia that also faces poverty problems is North Sulawesi. Based on data from the Central Statistics Agency (BPS), poverty in North Sulawesi in 2020 reached 8.19% of the total population, which shows that poverty is still a serious challenge in this region. However, the North Sulawesi government

has made efforts to eradicate poverty from year to year. This is evidenced by the poverty rate from year to year in the region has decreased. The poverty figures can be seen in table 1.

**Table 1. Percentage of Poor Population in North Sulawesi Province 2011-2020**

| Year | Percentage |
|------|------------|
| 2011 | 9,36 |
| 2012 | 8,46 |
| 2013 | 9,43 |
| 2014 | 9,16 |
| 2015 | 9,46 |
| 2016 | 9,18 |
| 2017 | 8,86 |
| 2018 | 8,53 |
| 2019 | 8,36 |
| 2020 | 8,20 |

Source: Indonesia Database for Policy and Economic Research (INDO DAPOER)

Based on the table 1, the percentage of poor people in North Sulawesi over the past 10 years, although it has decreased, there are still fluctuating numbers in it. The number of decreases from 2011-2020 was 9.36 percent in 2011 to 8.20 percent in 2020. From the table 1, it can be seen that poverty is still a major problem. Thus, the government plays a crucial part in alleviating poverty by implementing policies that involve boosting spending in important areas like education, healthcare, and infrastructure. These sectors are considered crucial in the fight against poverty and in enhancing the well-being of individuals. Hence, the purpose of this study is to investigate how government expenditure in education, healthcare, and infrastructure influences poverty rates in the areas of North Sulawesi Province.

It is thought that investing in education by the government can enhance the capabilities of individuals by enhancing their education and skills. Within the education sector, government spending is focused on enhancing the availability and standard of services for basic and secondary education. The availability of adequate educational facilities, teacher training, and educational assistance programs such as scholarships are expected to increase school participation rates and expand employment opportunities in the future. Good education opens up opportunities for social mobility which is the key to breaking out of the cycle of poverty. Meanwhile, the government's spending in the healthcare industry is directed towards ensuring that all individuals have access to fair, cost-effective, and high-quality medical care. Programs such as the National Health Insurance (JKN) implemented at the regional level, the provision of basic health facilities, and improving community nutrition are concrete efforts to reduce mortality rates, increase productivity, and reduce the economic burden on poor households due to health costs.

Government expenditure on infrastructure, such as the construction of roads, bridges, and other public facilities, plays a role in improving connectivity and economic access, especially in remote areas. The construction of roads, bridges, clean water networks, and electricity in remote areas of North Sulawesi can encourage economic integration between regions, accelerate the distribution of goods and services, and open up new business opportunities in rural areas. However, previous studies have produced inconclusive results regarding the impact of government spending on education, health, and infrastructure on poverty. These topics have not been heavily researched in the past. Some studies found that government expenditure on education, health, and infrastructure was able to encourage poverty (Ali et al., 2020; Hartanto, 2022). Conversely, different research indicates that allocating funds to education, healthcare, and public works by the government has successfully decreased levels of poverty (Resubun & Yudha, 2024), or even government expenditure on education, health, and infrastructure had no effect on poverty (Hidayat & Azhar, 2022). This brings up the issue of how much impact government spending on education, healthcare, and public works has on poverty rates in North Sulawesi. Thus, the aim of this research is to examine how government spending on education, healthcare, and public works affects poverty rates in the districts and cities of North Sulawesi from 2011 to 2020, with the goal of offering empirical data and suggestions for policies that can help reduce poverty in the region.

## 2. LITERATURE REVIEW

### 2.1. Government Expenditure

Government expenditure is a component of fiscal policy that serves as an instrument of intervention to influence the course of the economy. Through this policy, the government carries out its function by allocating funds for the procurement of goods and services aimed at meeting public needs. Over time, the role and scale of government expenditure in the economy tend to increase in line with the growth of Gross Domestic Product (GDP) (Sukartini & Saleh, 2012). This phenomenon aligns with the theory proposed by Adolph Wagner in 1880, known as Wagner's Law or the Law of Increasing State Activity.

Wagner's Law states that government expenditure increases exponentially. This theory is based on the organic theory of the state, which views the government as an independent entity with the autonomy to act, separate from individuals within society (Mangkoesoebroto, 2001). Mathematically, Wagner's Law is expressed as follows:

$$\frac{P_k PP_1}{PPK_1} < \frac{P_k PP_2}{PPK_2} < .. < \frac{P_k PP_n}{PPK_n}$$

Description:

PkPP               : Government expenditure per capita

PPK                : Income per capita, i.e., GDP / total population

1, 2, ..., n        : Time period (years)

Wagner's Law, which explains the growth of government expenditure, is illustrated in Figure 1, where the increase in government expenditure follows an exponential pattern with a convex curve that moves upward from the bottom left to the top right, as shown by Curve 1, rather than the linear form represented by Curve 2.
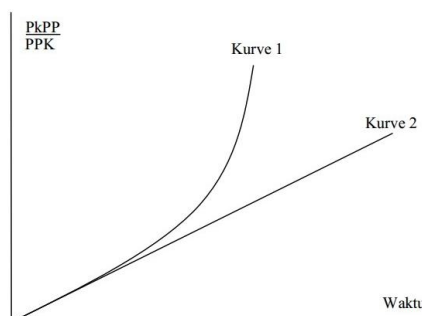


**Figure 1. Wagner's Law Curve**
Source : Mangkoesoebroto, 2001

According to Wagner, several factors contribute to the continuous expansion of government activities, including the growing need for protection and defense, the rising income levels of the population, the urbanization process accompanying economic growth, and the development of democratic systems. However, as the government's role expands, issues such as bureaucratic inefficiency arise, ultimately leading to a significant increase in government expenditure.

### 2.1.1. Government Expenditure on Education

Education is one of the key sectors in human development and poverty alleviation (Todaro & Smith, 2012). and therefore must be a top priority in addressing ignorance, underdevelopment, and socio-economic backwardness. The government should take the lead in ensuring equal access to education for all segments of society through expenditures on the provision of facilities, teaching staff, and educational programs aimed at improving both access to and the quality of education services. Enhancing the quality of education will lead to improved workforce skills, productivity, and income levels, which ultimately contributes to reducing poverty (Psacharopoulos, 1994).

### 2.1.2. Government Expenditure on Health

Health is a fundamental factor in the development of human resources (WHO, 2000). Government expenditure in the health sector is used to provide healthcare services, medicines, and disease prevention programs. Good health enhances productivity and the working capacity of the population, thereby helping to reduce poverty (Grossman & Krueger, 1995). Governments that invest in the health sector can improve the quality of life of their citizens and reduce the economic burden caused by illness.

### 2.1.3. Government Expenditure on Infrastructure

Infrastructure is essential for economic development as it supports various activities like manufacturing, trade, and transportation by providing necessary facilities for their smooth operation both domestically and globally (Aschauer, 1989). Facilities such as roads, bridges, clean water systems, and electricity not only improve connectivity and the efficiency of public services but also open up market access and business opportunities that have the potential to reduce poverty (Calderón & Servén, 2004). Therefore, government expenditure in the infrastructure sector plays a strategic role in accelerating development, improving public welfare, and reducing poverty.

### 2.2. Poverty

Poverty is a condition in which individuals or groups are unable to meet basic living needs such as food, clothing, shelter, education, and healthcare (Todaro & Smith, 2012). This condition does not only reflect economic limitations alone, but is also closely related to access to basic services and involvement in productive activities that support welfare. Therefore, poverty alleviation requires multidimensional interventions, including targeted government expenditure in education, health, and infrastructure.

### 2.3. Relationship between Government Expenditure and Poverty

As per the principles of economic growth, investing in education, healthcare, and essential infrastructure by the government plays a crucial role in alleviating poverty (Ranis & Stewart, 2000). Education and health improve the quality of human resources, while infrastructure supports economic activities that drive job creation and income generation. Therefore, effective allocation of expenditure in these three sectors is expected to reduce poverty levels in a region, including North Sulawesi.

### 2.4. Previous Research

Various studies in the past have looked into how government spending on education, healthcare, and public works affects poverty levels, both internationally and within Indonesia. In a study conducted by Omodero (2019) in Nigeria from 2000 to 2017, it was found that government spending in various sectors such as agriculture, education, health, and construction did not have a notable impact on reducing poverty levels, as indicated by the regression analysis. A study conducted in the same region with similar results was carried out by Yahaya (2019), which found that government expenditure on education, health, and agriculture had no significant impact on poverty. Similar findings were also observed in Indonesia, specifically in a study by Fithri & Kaluge (2017) which analyzed the connection between the amount of money the government allocates to education and health programs in East Java and how it affects poverty rates. The study found that there was no notable link between government expenditures in these areas and the rate of poverty in the region.

Several research studies have shown that government spending on education has no impact on poverty levels, whereas government spending on healthcare has been found to significantly decrease poverty. Some of these include the study by Aini (2020) which analyzed the effect of government expenditure in education, health, and social protection on poverty in regencies/cities in East Java. According to the research, spending on education did not have a notable impact on poverty, whereas spending on health and social protection had a significant negative impact. Futunanembun et al. (2023) examined the effect of government expenditure in education and health on poverty in West Papua. The results showed that education expenditure did not significantly affect poverty, whereas health expenditure had a negative and significant effect. Akbar & Taufik (2023) studied the influence of government expenditure on education, health, and social assistance on poverty levels in the Special Region of Yogyakarta. Their findings indicated that government expenditure in the health sector and economic growth had a significant negative effect on poverty, while education expenditure had no effect on poverty levels. Pangke et al. (2018) investigated the impact of government expenditure in education and health on poverty in Jayapura City. The study found that education expenditure had no significant effect

on poverty, while health expenditure had a negative and significant effect. Bonggakaradeng (2018) also examined research on government spending in education showed that investing in health had a detrimental effect on poverty levels, while spending on education did not show any impact. Additionally, economic growth was found to have a noteworthy negative influence on poverty.

However, other studies have found that government expenditure in the education and health sectors does have an impact on poverty. Laksmi & Puteri (2024) studied the impact of government spending on education and healthcare on the levels of poverty. The research discovered that investing in education and healthcare had a notable influence on poverty in Kuningan Regency, West Java. Another study by Niuwa et al. (2019) investigated on how government spending on education and healthcare in Gorontalo impacts poverty. Findings indicated that investing in education had a beneficial impact on reducing poverty, whereas investing in healthcare had a detrimental impact on poverty levels.

Additionally, several other research studies have incorporated government infrastructure spending as a variable in their analyses, yielding varied outcomes. Resubun & Yudha (2024) research investigated how government spending on health, education, and infrastructure affected poverty levels across districts and cities in Papua Province. Their findings indicated that government investments in all three sectors including health, education, and infrastructure significantly reduced poverty in the area. However, Hidayat & Azhar (2022) study produced contrasting results, revealing that health and infrastructure expenditures showed no meaningful impact on poverty reduction, whereas educational spending demonstrated a significant negative correlation with poverty. Similarly divergent outcomes were documented by Ali et al. (2020) in their examination of government spending's influence on poverty in the Lombok region. Their research concluded that government expenditures across education, health, and infrastructure sectors all showed a significant positive relationship with poverty levels in East Lombok.

## 3. RESEARCH METHODS

### 3.1. Panel Data Method

This research employs a quantitative methodology utilizing temporal data spanning from 2011 to 2020 combined with cross-sectional data from 15 districts and municipalities. Consequently, the study uses panel data, which integrates both cross-sectional and time series datasets. The research draws its information from two primary sources: the Indonesia Database For Policy And Economic Research (INDO DAPOER) and the Directorate General of Fiscal Balance (DJPK). The study follows an explanatory research framework designed to examine and quantify the cause-and-effect relationships between government spending variables and poverty rates. The data collection process exclusively uses secondary information sourced from reputable official organizations to maintain data accuracy, uniformity, and dependability.

### 3.2. Panel Data Model

#### 3.2.1. Pooled Least Squares (PLS)

Pooled Least Squares is the simplest approach in panel data analysis, using the Ordinary Least Squares (OLS) method applied to pooled data, and is often referred to as Pooled Least Squares (PLS). In the PLS method, the model assumes that the combined data represents the actual conditions, and that the intercept values for each variable are the same, as well as the slope coefficients for each variable being identical across all cross-sectional units.

#### 3.2.2. Fixed Effect Model (FEM)

The Fixed Effect Model (FEM) can capture differences between objects even though it uses the same regression coefficients. FEM means that each object has a constant value that remains fixed across different time periods. The regression coefficients are also constant over time (time-invariant).

#### 3.2.3. Random Effect Model (REM)

Integrating dummy variables into the fixed effect model may lead to drawbacks. Adding these dummy variables could lead to a decrease in degrees of freedom, impacting the precision of the estimated parameters. The error component model approach, also known as the Random Effect Model (REM), can be used to tackle

a panel data model that has correlation in the error term due to time changes and variations across observations.

## 3.3. Panel Data Model Selection

### 3.3.1. Chow Test

The Chow Test is utilized for deciding whether the Pooled Least Squares (PLS) model or the Fixed Effect Model (FEM) is better suited for estimating panel data. If the results of the test suggest that the Pooled Least Squares (PLS) approach is the way to go, then the Hausman Test is not needed. On the other hand, if the Chow Test indicates that the Fixed Effect Model (FEM) is the right choice, then it is necessary to conduct a follow-up test using the Hausman Test. The Chow Test, also known as the Likelihood Ratio Test, is conducted under the following assumptions:

H0: Pooled Least Square (PLS)

H1: Fixed Effect Model (FEM)

1) When the p-value F is greater than 0.05, the conclusion drawn is to accept H0 and reject H1, indicating that the most suitable model to use is the Pooled Least Squares (PLS) model.
2) On the other hand, if the p-value F is less than 0.05, the decision is made to reject H0 and accept H1. This signifies that the appropriate model to employ would be the Fixed Effect Model (FEM), and further examination through the Hausman Test is needed to choose between the fixed effect or random effect model.

### 3.3.2. Hausman Test

Once the Chow Test is finished and the suitable model is identified, the next step is to evaluate which model - Fixed Effect or Random Effect - is more appropriate. This evaluation process is called the Hausman Test. The test is carried out based on the following set of hypotheses:

H0: Random Effect Model (REM)

H1: Fixed Effect Model (FEM)

The guideline used for drawing conclusions in the Hausman Test is as follows:

1) If p-value F > 0,05 then H0 is accepted and H1 is rejected. This means the appropriate model is the REM.
2) If p-value F < 0,05, then H0 is rejected and H1 is accepted. This means the appropriate model is the FEM.

### 3.3.3. Lagrange Multiplier Test

The Lagrange Multiplier Test is used to compare the Random Effect Model (REM) and Pooled Least Squares (PLS) models to find the most suitable model. This test is assessed using the chi-square distribution with degrees of freedom equivalent to the number of independent variables. The hypotheses for this test are outlined below:

H0: Pooled Least Squares (PLS)

H1: Random Effect Model (REM)

### 3.3.4. Empirical Model

The empirical model used in this study is as follows:

$$POV_{it} = \beta_0 + \beta_1 lnGEDU_{it} + \beta_2 lnGHEA_{it} + \beta_3 lnGINF_{it} + \varepsilon_{it}$$

Where:
POV = Percentage of poor population (percent)
lnGEDU = Natural logarithm of government expenditure on education (trillion)
lnGHEA = Natural logarithm of government expenditure on health (trillion)
lnGINFR = Natural logarithm of government expenditure on infrastructure (trillion)
$\beta_0$ = Constant
$\beta_1, \beta_2, \beta_3$ = Regression Coefficient

ε          = Error term
i          = cross section, 232 regencies/cities
t          = time series (2011-2020)
ln         = natural logarithm

### 3.3.5. Classical Assumption Test

This test is required when the selected estimation model is either PLS or FEM. According to Gujarati & Porter (2013), panel data tend to exhibit less collinearity among variables. Since this study uses more than 30 observations, the normality test is not required. In general, four classical assumption tests are applied, namely: normality test (residual distribution), multicollinearity test (correlation between independent variables), heteroscedasticity test (variance consistency of residuals), and autocorrelation test (correlation of residuals across time).

### 3.3.6. Statistical Test

a) Partial Test (T-Test): This analysis assesses how each explanatory variable independently influences the outcome variable. When the calculated t-value exceeds the critical t-value and the probability value falls below 0.05, the variable demonstrates a statistically significant impact.

b) Simultaneous Test (F-Test): This examination determines whether all explanatory variables collectively influence the outcome variable. When the computed F-value surpasses the critical F-value and the probability value is less than 0.05, the overall model is deemed statistically significant.

c) Coefficient of Determination (R-Square): This measure represents the percentage of variance in the outcome variable that the explanatory variables account for. An $R^2$ value approaching 1 indicates that the model provides a superior explanation of the data patterns.

## 4. RESULTS AND DISCUSSION

### 4.1. Research Results

#### Table 2. Results of Pooled Least Square, Fixed Effect Model, and Random Effect Model

| Independent Variable | Details | PLS | FEM | REM |
|---|---|---|---|---|
| C | Coefficient | 42.31738 | 18.51977 | 18.87238 |
| | t-Stat | 3.24 | 4.16 | 4.22 |
| | Prob | 0.001 | 0.000 | 0.000 |
| lnGEDU | Coefficient | -1.380389 | -0.3976403 | -0.4128288 |
| | t-Stat | -2.49 | -1.89 | -1.98 |
| | Prob | 0.014 | 0.062 | 0.047 |
| lnGHEA | Coefficient | -0.4351522 | -0.000036 | -0.4335001 |
| | t-Stat | -0.48 | -2.46 | -2.47 |
| | Prob | 0.631 | 0.015 | 0.013 |
| lnGINFR | Coefficient | 0.3885048 | 0.4538082 | 0.455157 |
| | t-Stat | 0.68 | 2.87 | 2.91 |
| | Prob | 0.497 | 0.005 | 0.004 |
| R-Squared | | 0.0808 | 0.1148 | 0.1147 |

*Standard errors in parenthere*\*\*\*p<0.01 \*\*p<0.05 \*p<0.1

Source: Processed STATA 14 data, 2025

The following step involves running the model selection test using the Chow test, Hausman test, and Lagrange Multiplier test.

#### Table 3. Chow Test Results

| Prob>F | 0.000 |
|---|---|
| α | 5% |
| $H_0$ = PLS | |
| $H_1$ = FEM | |

Source: Processed STATA 14 data, 2025

According to the outcomes of the Chow test, with a probability value of 0.0000 which is less than 0.05, the Fixed Effect Model has been chosen as the preferred model.

**Table 4. Hausman Test Results**

| | |
|---|---|
| Chi square | 0.25 |
| Prob > Chi square | 0.9696 |
| $\alpha$ | 5% |
| $H_0$ = REM | |
| $H_1$ = FEM | |

Source: Processed STATA 14 data, 2025

In Table 4, the result of the Hausman Test indicates a chi-square probability value of 0.9696, indicating that the chi-square probability is greater than 0.05 at a significance level of 5%. Therefore, the decision is made to follow $H_0$ and utilize the REM model. Next, the Lagrange Multiplier (LM) test will be conducted.

The aim of the Lagrange Multiplier (LM) test is to determine the most suitable model between the Random Effect Model (REM) and the Pooled Least Square (PLS). This test utilizes the chi-square distribution with degrees of freedom corresponding to the independent variables. The results of the Lagrange Multiplier (LM) test are summarized as follows:

**Table 5. Lagrange Multiplier Test Results**

| | |
|---|---|
| Chibar2 | 558.40 |
| Prob > Chi square | 0.0000 |
| $\alpha$ | 5% |
| $H_0$ = PLS | |
| $H_1$ = REM | |

Processed STATA 14 data, 2025

The Lagrange Multiplier (LM) test produces a Prob Chibar2 value below the significance level ($\alpha$), which supports the selection of the Random Effect Model (REM). According to the data presented in Table 4, the value of 0.0000 is less than 0.05. Consequently, the Lagrange Multiplier (LM) test confirms that the Random Effect Model (REM) is the appropriate choice. Following the outcomes of all three diagnostic tests, the conclusion is that the Random Effect Model (REM) represents the most suitable analytical approach for this research. Therefore, conducting classical assumption tests becomes unnecessary.

Subsequently, individual variable testing is performed to analyze how each explanatory variable influences the outcome variable by examining the probability values that these variables produce. According to the estimation outcomes from the chosen analytical approach, the Random Effect Model (REM), the results are presented below.

**Table 6. Results of t-Statistik Test**

| Variable | P>|t| |
|---|---|
| lnGEDU | 0.047 |
| lnGHEA | 0.013 |
| lnGINFR | 0.004 |

Source: Processed STATA 14 data, 2025

a.  The lnGEDU variable (educational sector government spending) shows a probability value below the significance threshold, specifically 0.047 < 0.05, indicating statistical significance at the 5% level. This demonstrates that government investment in education significantly impacts poverty levels.
b.  The lnGHEA variable (health sector government spending) exhibits a probability value below the significance threshold, with 0.013 < 0.05, confirming that government expenditure on healthcare significantly influences poverty rates.
c.  The lnGINFR variable (infrastructure sector government spending) displays a probability value below the significance threshold, where 0.004 < 0.05, establishing that government spending on infrastructure significantly affects poverty conditions.

Regarding the combined variable test, the findings reveal that the F-statistic probability value falls below the significance threshold at 0.0005 < 0.05, demonstrating that at the 5% significance level, all explanatory

variables collectively influence the model. This confirms that government spending variables across education, health, and infrastructure sectors jointly impact poverty levels in the districts and municipalities of North Sulawesi.

Following this, the explanatory power measurement is employed to assess the model's ability to account for variations in the outcome variable. The findings indicate an R-squared value of 0.1147, meaning that 11.47% of the variation in poverty levels (outcome variable) can be attributed to changes in government expenditures across education, health, and infrastructure sectors (explanatory variables). The remaining 88.53% of the variation stems from factors not included in this analytical model.

## 4.2. Discussions

A research analysis showed that the amount of money the government invested in education in North Sulawesi Province from 2011 to 2020 had a notable adverse effect on poverty rates. This means that as government spending on education increased, poverty decreased in the region. The regression coefficient value for government expenditure in the education sector was -0.4128288, with a probability level of 0.047, indicating statistical significance. The results suggest that investing more in education can help alleviate poverty in the regencies/cities of North Sulawesi Province. A 1% increase in government education expenditure will reduce poverty by 0.41%. According to the analysis in this study, increasing education expenditure can expand public access to quality education, improve the skills and competitiveness of the workforce, and open up broader economic opportunities. Therefore, government expenditure becomes one of the key instruments in an effective poverty alleviation strategy in North Sulawesi. These results are in line with the studies by Resubun & Yudha (2024), Hidayat & Azhar (2022), and Laksmi & Puteri (2024), which also found that spending by the government in education leads to a noteworthy decrease in poverty levels.

During the 2011-2020 period in North Sulawesi Province, the analysis reveals that government healthcare expenditure significantly influences poverty rates, demonstrated by a t-statistic probability value of 0.013, which falls below the 5% significance threshold. The negative coefficient of -0.4335001 indicates an inverse relationship where increased government investment in health services corresponds to reduced poverty levels. More precisely, every 1% rise in healthcare spending correlates with a 0.43% decline in poverty rates within the region. According to the analysis in this study, increased health expenditure can lower morbidity rates, improve the quality of life, and enhance population productivity. With better access to healthcare facilities, poor communities have a greater opportunity to break free from the cycle of poverty caused by high healthcare costs and reduced work capacity. These results are in line with studies by Aini (2020), Futunanembun et al. (2023), Akbar & Taufik (2023), Pangke et al. (2018), Bonggakaradeng (2018), Resubun & Yudha (2024), Niuwa et al. (2019), and Laksmi & Puteri (2024) which found that government expenditure in the health sector has a negative and significant effect on poverty.

Unlike the education and healthcare sectors, the research results showed that government infrastructure expenditure had a positive and statistically significant effect on poverty levels across districts and municipalities in North Sulawesi Province during 2011-2020. This finding is validated by a t-statistic probability value of 0.004, which is below the 5% significance threshold (0.05). The infrastructure spending coefficient of 0.455157 demonstrates that increases in this type of government expenditure correspond to elevated poverty rates in the region. Specifically, a 1% rise in government infrastructure spending results in a 0.45% increase in poverty. According to the analysis in this study, the increase in government infrastructure expenditure has not yet effectively reduced poverty levels and even tends to correlate with an increase in poverty. This is because infrastructure projects that have been implemented are not yet evenly distributed and do not directly address the needs of the poor. In addition, short-term infrastructure expenditure may benefit the formal sector and large investors more, while its impact on low-income communities remains limited or delayed. A study that aligns with these findings is that of Ali et al. (2020), which states that government expenditure in the infrastructure sector has a positive and significant effect on poverty.

## 5. CONCLUSIONS

Based on the analysis results, it can be concluded that government expenditure in the education and health sectors has a negative and significant effect on poverty in the regencies/cities of North Sulawesi. This means that increasing the budget for these two sectors is effective in reducing poverty levels. On the other

hand, government expenditure in the infrastructure sector shows a positive and significant effect on poverty, indicating that infrastructure expenditure has not yet had an optimal impact on poverty reduction. These findings highlight the importance of adjusting policy strategies, particularly in the planning and implementation of infrastructure expenditure, to ensure it is more targeted and benefits poor communities.

The suggestion that the author can offer based on the results of this study is that the regencies/cities governments in North Sulawesi should further optimize expenditure in the education and health sectors, considering that both sectors have been proven to have a negative and significant effect on reducing poverty. Budget allocations should be directed toward programs that can improve the quality of basic services and expand access for the poor. In addition, the government needs to evaluate infrastructure expenditure, which has shown a positive and significant effect on poverty. This indicates that the existing infrastructure development has not fully had a direct impact on improving the welfare of the poor. Therefore, future infrastructure planning needs to be more targeted, inclusive, and integrated with poverty alleviation programs so that its impact can be evenly felt across all levels of society.

Furthermore, this study has limitations in terms of the variables used, which only include government expenditure in the education, health, and infrastructure sectors. Therefore, the author suggests that future research should consider other variables that also influence poverty, such as social expenditure, agricultural expenditure, or direct cash assistance. Future studies are also encouraged to expand the scope of regional analysis, for example by comparing provinces in Eastern Indonesia, in order to provide a broader picture of the effectiveness of government expenditure in reducing poverty.

## 6. REFERENCES

Aini, R. (2020). Analisis Pengaruh Pengeluaran Pemerintah Sektor Pendidikan, Kesehatan dan Perlindungan Sosial Terhadap Kemiskinan Pada Kabupaten/Kota di Jawa Timur. *Jurnal Ekonomi Universitas Diponegoro*, *8*(2).

Akbar, M. K. F., & Taufik, M. (2023). The Effect of Government Expenditure for Education and Health Sectors on the Poverty Rate of Yogyakarta Special Region Province. *Jurnal Ekonomi Dan Bisnis Digital*, 2(4), 1187–1204.

Alfian, J., & Bonggakaradeng. (2018). The Effect of Education Sector Expenditure, Health Sector Expenditure, and Economic Growth on Poverty Level in Tana Toraja. *Proceedings of the National Academy of Sciences*, *3*(1), 1–15.

Ali, M., Muhamad, F., Jailani, H., & Azmi, M. S. (2020). Pengaruh Belanja Pemerintah Terhadap Tingkat Kemiskinan Di Kabupaten Lombok Timur Tahun 2010-2018 Muhamad. *Jurnal Pendidikan Ekonomi Dan Kewirausahaan*, *4 (1)*(1), 104–119.

Aschauer, D. A. (1989). Is public expenditure productive? *Journal of Monetary Economics*, 23(2), 177–200. https://doi.org/10.1016/0304-3932(89)90047-0

Bella C. A. Pangke, Transna Putra Urip S, R. M. W. M. (2018). Jurnal Kajian Ekonomi dan Studi Pembangunan Volume II No. 1, April 2015. *Kajian Ekonomi Dan Studi Pembangunan*, *II*(1), 41–60.

Calderón, C., & Servén, L. (2004). *The Effects of Infrastructure Development on Growth and Income Distribution*.

Fithri, N., & Kaluge, D. (2017). Analisis Pengaruh Pengeluaran Pemerintah Sektor Pendidikan Dan Kesehatan Terhadap Kemiskinan Di Jawa Timur. *Jurnal Ekonomi Pembangunan*, *15*(2), 129. https://doi.org/10.22219/jep.v15i2.5360

Futunanembun, B. A., Rorong, I. P. F., & Siwu, H. F. D. (2023). Pengaruh Pengeluaran Pemerintah Di Sektor Pendidikan Dan Kesehatan Terhadap Kemiskinan Di Provinsi Papua Barat. *Jurnal Berkala Ilmiah Efisiensi* , *23*(7), 217–228.

Grossman, G. M., & Krueger, A. B. (2010). Economic Growth and The Environmet. *The Quarterly Journal of Economics*, *110*(2), 353–377.

Hartanto, T. (2022). Analysis of Local Government Financial Statements (LKPD) to Improve the Quality of Governance and the Achievement of Development Outcomes in South Sulawesi. *Journal Of Management*,

*Accounting, General Finance And International Economic Issues*, 2(1), 375–383. https://doi.org/10.55047/marginal.v2i1.500

Hidayat, A. Y., & Azhar, Z. (2022). Analisis Pengeluaran Pemerintah Di Sektor Kesehatan, Pendidikan, Dan Infrastruktur Terhadap Tingkat Kemiskinan Di Indonesia. *Jurnal Kajian Ekonomi Dan Pembangunan*, 4(1), 65. https://doi.org/10.24036/jkep.v4i1.13308

Laksmi, A. C., & Puteri, S. A. (2024). The Effect of Government Expenditure on Education and Health Sectors on Poverty Rate (Study at Kuningan Regency, West Java). *International Journal on Economics, Finance and Sustainable Development*, 6(8), 129–141. https://doi.org/10.31149/ijefsd.v6i8.5311

Ni Made Sukartini, & Samsubar Saleh. (2012). Pengujian Hukum Wagner Dalam Perekonomian Indonesia Kajian Pengeluaran Pemerintah Pusat Dan Pemerintah Provinsi. *Jurnal Bisnis Dan Ekonomi (JBE)*, 19(1), 1–24.

Niuwa, W. M., Olilingo, F. Z., & Santoso, I. R. (2019). The Influence of Government Expenditure in Education and Health Sector on The Poverty in Gorontalo. *Jambura Equilibrium Journal*, 1(2). https://doi.org/10.37479/jej.v1i2.4380

Omodero, C. O. (2019). Government sectoral expenditure and poverty alleviation in Nigeria. *Research in World Economy*, 10(1), 80–90. https://doi.org/10.5430/rwe.v10n1p80

Psacharopoulos, G. (1994). Returns to investment in education: A global update. *World Development*, 22(9), 1325–1343. https://doi.org/10.1016/0305-750X(94)90007-8

Ranis, G., & Stewart, F. (2000). Strategies for Success in Human Development. *Journal of Human Development*, 1(1), 49–69. https://doi.org/10.1080/14649880050008764

Resubun, R., & Yudha, I. M. E. K. (2024). Pengaruh Pengeluaran Pemerintah Sektor Kesehatan, Pendidikan, dan Infrastruktur terhadap Kemiskinan di Kabupaten/Kota Provinsi Papua. *E-Jurnal Ekonomi Pembangunan Universitas Udayana*, 13(5), 307–319. https://doi.org/10.24843/EEP.2024.v13.i05.p01

WHO. (2000). How Well Do Health Systems Perform. *The World Health Report 2000*, 1–206.

Yahaya, N. (2019). Relationship between Government Expenditure and Poverty: A Study of Nigeria (1965-2014). *IOSR Journal of Economics and Finance*, 10(6), 39–52. https://doi.org/10.9790/5933-1006043952