INVESTMENT AND EXPORT EFFECT ON POVERTY THROUGH GROWTH: EVIDENCE FROM INDONESIA'S NICKEL PRODUCING PROVINCES

Muhammad Yusrun Najah[*]

Faculty of Economic and Business, Universitas Diponegoro, Semarang, Indonesia

*Corresponding author: myusrunnajah@students.undip.ac.id

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ABSTRACT

This study investigates the effect of investment and exports on poverty, considering the role of economic growth as a mediating variable. It uses a quantitative approach through path analysis and panel data from 2013 to 2024 in four nickel-producing provinces, namely North Maluku, Southeast Sulawesi, South Sulawesi, and Central Sulawesi. The results show that investment and exports contribute directly to economic growth, but only investment has a significant impact on poverty reduction. Indirectly, neither has a significant effect on poverty through economic growth. These findings indicate that the growth that has occurred is not yet inclusive, so it is necessary to strengthen access to basic services and create jobs in labor-intensive sectors to encourage a more equitable distribution of economic benefits.

1. INTRODUCTION

Indonesia is a country rich in natural resources, particularly in the mining sector, such as coal, nickel, gold, and copper. This potential makes the mining sector one of the main contributors to state revenue and national economic growth. Nickel is one of the natural resources that is currently experiencing an increase in strategic value at the global level, especially with the increasing demand for electric vehicle batteries and renewable energy technology (Sun et al., 2024). According to the US Geological Survey (USGS), Indonesia has the largest nickel reserves in the world, amounting to 55 million tones or 42 per cent of the world's nickel reserves in 2023. Based on data from the (Ministry of Energy and Mineral Resources of Indonesia, 2023), Indonesia's nickel resources amount to 17.7 billion tons of ore and 177.8 million tons of metal. Most of Indonesia's nickel reserves, around 90%, are spread across the provinces of Southeast Sulawesi, Central Sulawesi, South Sulawesi, and North Maluku.

As the country with the largest nickel reserves in the world, Indonesia has a great opportunity to utilize this commodity as a driver of national economic growth. Nickel not only contributes to increased exports and state revenue, but also drives local economic activity through job creation and infrastructure development (Ika, 2017). This is reflected in the increase in investment in the industrial sector, particularly nickel, in various provinces such as Central Sulawesi, Southeast Sulawesi, South Sulawesi, and North Maluku, which are now centered of mining-based regional growth. With sustainable management and policies that promote equitable distribution of benefits, the mining sector has the potential to be an important catalyst in Indonesia's economic transformation.

Investment is widely recognized as a principal driver of economic growth because it expands the economy's stock of productive capital. According to the Harrod–Domar framework, economic growth requires net additions to the capital stock, hence the centrality of investment for generating higher output (Todaro & Smith, 2011a). The Solow growth model complements this view by showing that long-run growth depends on capital accumulation, labor growth, and technological progress, with investment raising the capital stock and thereby boosting productivity (Solow, 1956a). In the process, investment can stimulate job creation and thereby contribute to poverty reduction by expanding output and absorbing surplus labor — a mechanism emphasized in Lewis' dual-sector model, which posits that investment in modern sectors draws labor out of subsistence agriculture and raises aggregate incomes (Lewis, 1954). Because economies that rely heavily on consumption are vulnerable to external shocks and weak demand, both public investment (infrastructure, human capital) and private investment (firm-level capital formation) are important policy levers to foster resilient, employment-creating growth (Sukirno, 2007). However, the poverty-reducing impact of investment is conditional on factors such as the composition of investment, institutional capacity, and equitable distribution of gains.

Empirical findings reinforce the validity of the relationship between investment, economic growth, and poverty reduction. A study by Asrian & Saharuddin (2024) shows that increased investment has a significant impact on economic growth in Indonesia, which indirectly contributes to a reduction in poverty levels through output expansion and job creation. However, IMF (2021) shows that the effectiveness of economic growth in reducing poverty is greatly influenced by the level of inclusiveness and distribution of benefits among income groups. Exclusionary growth has the potential to widen inequality and limit the access of poor groups to economic opportunities. Therefore, investment strategies need to be designed in a targeted and responsive manner, focusing on labor intensive sectors and areas with high poverty concentrations, to ensure that the contribution of investment to socio-economic development is optimal, sustainable and inclusive (World Bank, 2020). Investment in the metal industry sector increased during the period 2015 to 2022 in Indonesia. Significant increases occurred in Indonesia's main nickel-producing regions, such as North Maluku, Central Sulawesi, and Southeast Sulawesi (Botutihe & Paksi, 2024). The majority of this investment was for the development of nickel refining facilities, stainless steel production, and other supporting infrastructure.

Exports are one of the drivers of economic growth, particularly in developing countries that are seeking to increase their production capacity and integrate into the global market. The classical theory of comparative advantage proposed by Ricardo (1817) says that countries will reap economic benefits if they focus their production on commodities that can be produced relatively more efficiently and then trade them internationally. This specialization enables increased productivity and efficient allocation of resources across sectors. Based on this principle, the Export-Led Growth (ELG) hypothesis states that an increase in exports can stimulate domestic production, attract foreign direct investment (FDI), improve the trade balance, and ultimately accelerate Gross Domestic Product (GDP) growth (Helpman & Krugman, 1985).

Empirical studies support the validity of this approach. Soeparno et al. (2025) show that exports have a significant effect on Indonesia's economic growth, especially in sectors with high global demand such as the nickel industry. In line with the endogenous growth theory developed by Romer (1990), openness to international trade not only expands market access but also encourages technology diffusion and knowledge accumulation, which contribute to long-term growth. Indonesia's export data shows a positive trend, the value of nickel and its derivative products in 2022 reached US$ 5.94 billion, an increase of 363% compared to the previous year (yoy), with the main contribution coming from the four main producing provinces (Pink & Laoli, 2023). This surge reflects the strategic role of the export sector in strengthening national income and supporting broader economic development.

The relationship between investment and exports on poverty is mediated by economic growth mechanisms. Increased investment plays a role in expanding national production capacity, encouraging job creation, and increasing productivity and aggregate output (Todaro & Smith, 2011b). Two-sector model by Lewis (1954) explains that investment in modern sectors such as

industry and services can attract labor from the less productive subsistence agricultural sector, thereby increasing national productivity and income. In addition, theory of comparative advantage, Ricardo (1817), emphasizes that specialization in the production and export of goods will increase productivity and accelerate economic growth through global market integration.

Increased productivity or output has direct implications for wage increases, Clark (1907) argues that wage levels reflect the marginal productivity of labor, so that increased productivity will lead to increased worker income. This has the potential to reduce poverty, especially if the resulting economic growth is inclusive and able to reach low-income groups. Thus, investment and exports are not only drivers of growth, but also strategic instruments in poverty alleviation when accompanied by equitable distribution of benefits and development policies that are responsive to the needs of vulnerable groups.

Some related studies, Anwar et al. (2024) found that in West Sulawesi Province, household consumption, government expenditure, investment, and exports exert a direct and statistically significant positive influence on the Human Development Index (HDI). However, when assessed indirectly through the HDI, government spending, investment, and exports demonstrate a significant negative effect on poverty levels. The result of study by Vidriza & Talmera (2024) found that FDI and public investment have no significant effect on poverty in the provinces of South Sulawesi, Central Sulawesi, Southeast Sulawesi, and North Maluku, only domestic direct investment has a significant effect. The results of research by Prawoto & Basuki (2022) found that Investment, road infrastructure, exchange rates, the Human Development Index (HDI), and government expenditure exert a direct and statistically significant positive influence on Indonesia's economic growth. Indirectly, both government spending and economic growth significantly contribute to poverty reduction, whereas investment does not demonstrate a meaningful impact on poverty through this pathway. The results of the study by Tobondo et al. (2021) found that In Central Sulawesi, Foreign Direct Investment (FDI) and government expenditure exhibit a direct, negative, and statistically significant impact on poverty reduction. Indirectly, FDI, Domestic Direct Investment (DDI), and government spending influence poverty significantly through their contribution to economic growth. The results of research by Supratiyoningsih & Yuliarmi (2022) found that directly, investment has no significant effect on economic growth in Bali. Indirectly, labor has a significant effect on poverty through economic growth in Bali, while investment and government spending have no effect.

Based on the explanation above, we analyzed the impact investment of metal mining & industry sector and export of metal and the derivatives on economic growth metal mining & industry sector directly. Furthermore, we analyze the effect of investment of metal mining & industry sector and export of metal and the derivatives on poverty through economic growth of metal mining & industry sector.

2. RESEARCH METHODS

This study uses a quantitative approach with panel data for the period 2013–2024. The year 2013 was chosen as the starting point because it coincided with the government of Indonesia's policy to ban commodity exports, making it the most relevant year to use as the starting point for the study. The data analysed is secondary and sourced from the Central Statistics Agency, the Investment Coordinating Board, and the Ministry of Trade. This analysis uses annual data compiled from these agencies.

Four provinces in Indonesia were carefully selected to form the study population. This study aims to evaluate the contribution of investment in the industrial sector and metal exports, particularly nickel commodities, to industrial sector economic growth and poverty reduction. Based on these objectives, the provinces that met the specific requirements were Central Sulawesi, South Sulawesi, Southeast Sulawesi, and North Maluku.

The variables used in this study include investment (X_1), which is capital investment in companies classified in the secondary sector, namely entities engaged in the production of physical goods. This sector includes the manufacturing, infrastructure, energy, mining, and industrial technology subsectors. The second variable is exports (X_2), which is the amount of money generated

from metals and their derivatives sent abroad. The next variable is economic growth (Z), which is the real Gross Regional Domestic Product of the mining and industrial sectors, and poverty (Y), which is the number of people still below the poverty line based on the standards of the central statistics agency.

The method used in this study is path analysis, which is an extension of multiple linear regression that allows testing causal relationships between independent and dependent variables, either directly or through intervening variables. This technique facilitates the mapping of influence paths and the estimation of the relative contributions of each variable in a complex causal system. Model visualization is carried out through path diagrams, which display the direction and magnitude of coefficients between variables. The advantages of path analysis lie in its ability to identify mediation effects, handle more than one dependent variable simultaneously, and produce more comprehensive estimates in interpreting the structure of relationships between variables. In this study, path analysis was used to measure the direct relationship between investment and exports on economic growth and poverty. In addition, path analysis also indirectly measures investment and exports on poverty through economic growth.

This research has 7 objects, which are 1) Examine the impact of investment on economic growth; 2) Examine the impact of export on economic growth; 3) Examine the impact of investment on poverty reduction; 4) Examine the impact of export on poverty reduction; 5) Examine the impact of economic growth on poverty reduction; 6) Examine how investment influences poverty reduction through economic growth; and 7) Examine how investment influences poverty reduction through economic growth.

The path analysis model used in the regression equation are:

$$LogZ = \beta_0 + \beta_1 LogX_1 + \beta_2 LogX_2 + e_1 \dots\dots\dots(1)$$

$$LogY = \beta_0 + \beta_1 LogX_1 + \beta_2 LogX_2 + \beta_3 LogZ + e_1 \dots\dots\dots(2)$$

Description:
$\beta_{0,1,2}$: constanta
X_1 : Investment of metal mining and industry
X_2 : Export of metal and their derivatives
Y : Poverty
Z : Gross domestic regional product of metal mining and industry
ϵ : error

Regression analysis begins with classical assumption testing to ensure the validity of OLS estimates. This procedure includes testing for multicollinearity through the variance inflation factor (VIF), detecting heteroscedasticity, and assessing autocorrelation with the Durbin–Watson statistic. The next stage is selecting the panel model specification. The Chow test is used to compare the common effect model with the fixed effect model. The Lagrange Multiplier (Breusch–Pagan) test examines the suitability of the common effect model with the random effect model. Then, the Hausman test distinguishes the consistency of the fixed effect model and the random effect model.

Statistical tests were conducted to assess the quality and significance of the model. The F-test examined the simultaneous significance of all independent variables, while the t-test assessed the individual significance of the coefficients. Goodness-of-fit measures such as R^2 and adjusted R^2 were used to examine the proportion of variation in the dependent variable explained by the model. Finally, as this study involved mediating variables, the Sobel test was used to test the significance of indirect effects.

This test calculates the z-value based on the path coefficients and standard errors of each direct and mediating path. The results of the Sobel test will show whether the mediating path is statistically significant. Thus, researchers can systematically separate the direct and indirect effects of independent variables on dependent variables.

3. RESULTS AND DISCUSSION
3.1. RESULTS

The first stage of the analysis begins with the classical assumption test. This test is necessary to ensure the validity and reliability of the regression model used in this study. The procedures carried out include testing for multicollinearity, heteroscedasticity, and autocorrelation. Each test is presented in the following tables and explained accordingly.

Multicollinearity testing aims to detect the presence of perfect or near-perfect linear relationships between independent variables in a regression model. One commonly used approach is to analyze the tolerance and variance inflation factor (VIF) values. Multicollinearity is considered to occur if the VIF > 10.0 accompanied by a tolerance < 0.10; conversely, if the VIF < 10.0 and the tolerance is > 0.10, then there are no indications of multicollinearity. The details of the data processing results are presented as follows:

Table 1. Multicollinearity test

Equation		Centered VIF
Equation 1		
	X_1	1.67
	X_2	1.678
Equation 2		
	X_1	3.60
	X_2	1.744
	Z	3.44

Source: Processed data (2025)

The Variance Inflation Factor results in Table 1 show that the correlation values between independent variables are below 10. Thus, this study does not indicate the presence of multicollinearity.

The heteroscedasticity test aims to assess the similarity of residual variance between observations in a regression model. Symptoms of heteroscedasticity are detected when the residual variance shows significant changes at various levels of the independent variable, while relatively constant variance indicates the absence of heteroscedasticity. A reliable regression model must be free from heteroscedasticity. Heteroscedasticity can be detected using the Glejser test with the following decision criteria: if the significance value (Sig.) is greater than 0.05, there is no heteroscedasticity; conversely, a Sig. value below 0.05 indicates heteroscedasticity in the regression model.

Table 2. Heteroskedasticity test

Equation		Centered VIF
Equation 1		
	X_1	0.6838
	X_2	0.1169
Equation 2		
	X_1	0.6998
	X_2	0.0976
	Z	0.5229

Source: Processed data (2025)

All independent variables show p-values above the significance level of 0.05, so Glejser's null hypothesis of no heteroscedasticity is accepted. Thus, there is no empirical evidence to indicate that the residual variance is not constant. These results confirm that the assumption of homoscedasticity in the regression model is satisfied, so that the regression coefficient estimates are statistically efficient and unbiased.

Autocorrelation is a condition in which residuals or errors in a regression model are correlated over time or between observations. In the context of time series or panel data, autocorrelation occurs when the residuals in a given period have a systematic relationship with the residuals in the previous period. Autocorrelation is usually tested using the Durbin–Watson (DW) statistic. A DW value close to 2 indicates no autocorrelation, while a value below 2 indicates positive autocorrelation, and a value above 2 indicates negative autocorrelation.

Table 3. Autocorrelation test

Equation	Durbin-Watson Stat
Equation 1	0.6895
Equation 2	0.8145

Source: Processed data (2025)

The Durbin-Watson's results in Table 3 show that the statistical values of both equations are between -2 and 2. Therefore, this study does not indicate the presence of autocorrelation.

After confirming that the regression model satisfies the classical assumptions, the next step is the selection of the most appropriate panel data model. To determine this, several statistical tests such as the Chow test, Lagrange Multiplier test, and Hausman test were applied. The results of these tests are discussed below.

Table 4. Chow test

Equation	Effect test	Statistic	Prob
Equation 1	Cross-section F	30.9677	0.000
Equation 2	Cross-section F	275.1685	0.000

Source: Processed data (2025)

The chow test is used to determine the best model between the common effect model and the fixed effect model. If the probability value is smaller than 0.05, the model chosen is the fixed effect model. Table 1 shows the chow test results from equations 1 and 2 have a probability value of 0.00 < 0.05, it means that the best model is the fixed effect model.

Table 5. Hausman test

Summary test	Summary test	Chi-sq Statistic	Prob
Equation 1	Cross-section random	82.5957	0.000
Equation 2	Cross-section random	825.5055	0.000

Source: Processed data (2025)

The Hausman test aims to select the best model between the random effect model and the fixed effect model. If the probability value obtained is less than 0.05, then the fixed effect model is selected as the most suitable model for analysis. Based on the Hausman test results shown in Table 2, the probability value for equations 1 and 2 is 0.000 < 0.05. This indicates that the best model to use is the fixed effect model. As the Chow test confirmed the significance of the fixed effect between subjects and the Hausman test confirmed the consistency of the estimates in the fixed effect model, it was not necessary to perform the Lagrange Multiplier test.

Following the model selection, the analysis continues with the estimation of direct effects. This part presents the coefficients of the independent variables and their statistical significance in relation to economic growth and poverty. To strengthen the robustness of the findings, additional statistical measures including the F-test and the coefficient of determination (R^2 and adjusted R^2) are also reported.

Table 6. Summary of direct effect

Variable	Coefficient	Std. Error	t count	Prob
$X_1 \rightarrow Z$	0.5621	0.0774	7.2609	0.0000
$X_2 \rightarrow Z$	0.0866	0.0201	4.317	0.0001
$X_1 \rightarrow Y$	-0.0397	0.0150	-2.6482	0.0114
$X_2 \rightarrow Y$	0.0023	0.0028	0.8452	0.4029
$Z \rightarrow Y$	-0.0149	0.0199	-0.7494	0.4579

Source: Processed data (2025)

The results in table 6 show that the path coefficient value for the investment variable is 0.562, with a significance value of 0.000. This value indicates that investment has a positive and significant effect on economic growth. The coefficient value of 0.562 indicates that every 1% increase in investment will increase gross domestic regional product by 0.56%. This finding is in line with the average trend of investment in the 4 provinces which continues to increase every year by 28%, while the average GDP in the 4 provinces continues to increase every year by 17%.

The path coefficient value of the effect of exports on economic growth is 0.08 with a significance value of 0.0001. this value indicates that exports have a positive and significant effect on economic growth. The coefficient value of 0.03 indicates that every 1% increase in investment exports increases the value of gross domestic regional product by 0.08%. The export trend increases from year to year. The value of exports in the 4 provinces in 2024 amounted to $31,772 million or a 15x increase from 2013.

The results of the analysis also show that investment has a negative and significant effect on the povert, with a path coefficient value of 0.039 and a significance value of 0.011, this shows that an increase in investment by 1% has an impact on reducing the poverty, namely by 0.39%. The export variable has a positive but insignificant effect on the poverty, with a path coefficient value of 0.0023 and a significance value of 0.4. This value indicates that every 1% increase in exports increases the poverty by 0.002%.

Further analysis shows that economic growth has a negative effect on poverty, with a path coefficient of -0.014 and a significance value of 0.45. This means that economic growth has a negative but insignificant effect on poverty reduction. Every 1% increase in economic growth only reduces the poverty by 0.014%.

Table 7. F test

Equation	F Statistic	Prob.
Equation 1	46.75	0.000
Equation 2	251.21	0.000

Source: Processed data (2025)

F test is a statistical technique used to test the collective significance of all independent variables in a regression model. The main purpose of this test is to assess whether the model as a whole is able to explain the variation that occurs in the dependent variable significantly. Based on the results shown in Table 7, it is known that the significance value (p-value) of Equation 1 and Equation 2 is below the threshold of 0.005. This finding indicates that the independent variables in the model have a simultaneous significant effect on the dependent variable.

Table 8. Determination Coefficient test or R^2

Equation	Adjusted R-Squared
Equation 1	0.829
Equation 2	0.969

Source: Processed data (2025)

The coefficient of determination measures the extent to which the model accounts for the variability of the dependent variable. The regression findings are presented in Table 8, equation 1 produces a coefficient of determination or adjustment R² of 0.829. This means that 82% of economic growth in the four provinces from 2013 to 2024 can be attributed to independent variables (investment and exports), while 18% is caused by external variables not included in the model. Equation 2 produces a coefficient of determination or adjustment R² of 0.96. This means that 96% of poverty in the four provinces from 2013 to 2024 can be attributed to independent variables (investment, exports and economic growth), while 4% is caused by external variables not included in the model.

Finally, the Sobel test is performed to evaluate the indirect effects of investment and exports on poverty through economic growth. This test provides evidence regarding the mediating role of growth in linking the independent variables to poverty outcomes.

Table 9. Summary of indirect effect

Influence	Path coef.	t stat	p-value	Std. error
$X_1 \rightarrow Z \rightarrow Y$	0.0083	0.744	0.45	0.011
$X_2 \rightarrow Z \rightarrow Y$	0.0012	0.737	0.46	0.001

Source: Processed data (2025)

Table 9 shows the sobel test value of investment on poverty through economic growth of 0.744 is smaller than the t table of 2.017. This means that indirectly investment has no significant effect on poverty through economic growth. The result of the analysis also shows that the sobel test value of export on poverty through economic growth of 0.734 is smaller than the t table of 2.017. This means that indirectly export has no significant effect on poverty through economic growth.

3.2. DISCUSSION

Table 3 shows that the direct relationship between investment, exports and economic growth. Investment of metal mining & industry sector has a positive effect on the gross domestic regional product of metal mining & industry sector. This result is the same as research by Ruslam & Anwar (2020) found a positive effect of investment on economic growth in the mining sector in Wajo Regency. The positive relationship between investment and economic growth corroborates the findings of Ennin & Wiafe (2023) identifies that foreign investment in the mining sector increases economic growth in Ghana. other studies, domestic investment has a positive impact on economic growth in Indonesia (Leonard et al., 2021). These findings are in line with Solow's economic growth theory, which emphasizes that investment accumulation plays a role in increasing aggregate output and Gross Domestic Product (GDP) through increased capital stock and productivity (Solow, 1956b). Furthermore, this also supports Lewis' dual-sector framework, in which investment in the industrial sector drives the shift of labor from traditional sectors to more productive sectors, thereby impacting national income growth as reflected in GDP growth (Lewis, 1954).

The relationship between exports and economic growth shows that the increase exports of metal and their derivatives sector have an impact on increasing the gross domestic regional product of metal mining & industry sector in these 4 provinces. This result is consistent with research by Soeparno et al. (2025) that metal and nickel exports have a positive effect on Indonesia's economic growth in the short and long term. Research by Leonard et al. (2021)

suggests that Indonesia's manufacturing exports have a positive effect on Indonesia's economic growth. These findings are consistent with the Export-Led Growth hypothesis, which proposes that increased exports stimulate domestic production, and accelerating GDP growth.

Table 3 shows that investment has a negative and significant effect on poverty, meaning that increased investment of metal mining & industry sector can reduce poverty levels in the 4 provinces. This finding is in line with research by Rizal & Rahayu (2020) that increased domestic direct investment can reduce poverty in Aceh Province. Increased foreign investment in Central Sulawesi Province in 2015-2019 has reduced the poverty rate through economic growth in the province (Tobondo et al., 2021). Meanwhile, Vidriza & Talmera (2024)found that domestic investment had a negative and significant effect on poverty in the provinces of North Maluku, Southeast Sulawesi, South Sulawesi, and Central Sulawesi. Meanwhile, foreign investment has a negative but insignificant effect on poverty in the province. Similar findings were also revealed by Simarmata & Iskandar (2022), stated that investment plays an important role in driving economic growth and increasing the human development index, which ultimately has an impact on poverty reduction.

The relationship between exports and poverty is different. Table 3 shows that exports of metal and their derivatives sector have a positive but insignificant effect on poverty, this means that the increase in exports of metal mining dan industry sector has an impact on increasing poverty levels in the provinces of North Maluku, Southeast Sulawesi, South Sulawesi and Central Sulawesi, although the impact is not significant. The results of this analysis are different from other studies. Ola Langoday (2024) found that exports in Indonesia have a significant effect on reducing the poverty rate in Indonesia.

The finding that exports do not have a significant impact on poverty can be explained by the Dutch Disease phenomenon, which is a condition in which a surge in commodity exports causes structural distortions in the economy. When exports in extractive sectors such as nickel increase, these sectors absorb excessive resources, including labor and investment, causing other more labor-intensive sectors such as agriculture and light industry to experience a decline in competitiveness. As a result, poor communities that depend on traditional sectors do not benefit directly from export expansion and may even be pushed into more vulnerable economic conditions (Corden & Neary, 1982). These results reinforce the argument that export growth does not necessarily reduce poverty levels, especially if it is not accompanied by redistribution policies, inclusive development, and strengthening the local economy. A recent study by Warburton (2024) shows that even though Indonesia's nickel exports and industrial activity have increased significantly, the benefits remain unevenly distributed, with many producing regions seeing little poverty-reduction or equitable gains

The relationship between economic growth and poverty shows that the increase in gross domestic regional product of metal mining and industry sector has an impact on reducing poverty in 4 provinces, although the impact is not significant. These results are different from Ola Langoday (2024) that economic growth has a significant effect in reducing poverty rates in Indonesia. Economic growth such as increased consumption, investment, government spending, and exports in Indonesia succeeded in reducing the poverty rate in Indonesia for the period 2009-2021. other research that economic growth actually drives the growth of the number of poor people directly, due to inequality in the distribution of asset ownership (Prawoto & Basuki, 2022). This finding explains that high growth does not necessarily reduce poverty. This can happen if income distribution is uneven. When growth is only enjoyed by the upper class or the formal sector, the poor in the informal sector do not feel the impact (Todaro & Smith, 2011b). This leads to growth without equity, where GDP increases but poverty rates stagnate or even worsen.

Indirectly, neither investment nor exports in the metal mining and industry sector had a significant effect on poverty through economic growth of metal mining & industry sector. This shows that economic growth has not been effective in mediating the impact of investment or exports on poverty. This may be because new employment opportunities and increased goods and services do not reach the poor. Increased investment and exports are enjoyed by people

who are not poor. This finding is different from Anwar et al. (2024) that indirectly investment has a significant positive effect on poverty in West Sulawesi, but exports have a negative effect.

These findings show that economic growth is not always inclusive, in the sense that it does not directly involve or provide tangible benefits to poor communities. High levels of investment and exports do not necessarily have an equal impact across all social levels, especially for low-income groups. This is due to the tendency for growth to be concentrated in urban areas and capital-intensive economic sectors, such as mining and large-scale manufacturing. Meanwhile, the poor generally live in rural areas and depend on subsistence agriculture or informal economic activities. When economic growth is not distributed spatially and sectorally, its effectiveness in reducing poverty levels becomes limited (Primadianti & Sugiyanto, 2021).

Furthermore, economic growth that is not accompanied by widespread job creation, increased labor productivity, and access to basic services such as education and health care tends to fail to address poverty structurally. Kakwani & Pernia (2000) emphasize the importance of the concept of pro-poor growth, which is growth that is explicitly designed to improve the welfare of the poor, not just to increase GDP. The effectiveness of growth in reducing poverty is highly dependent on the mechanism for distributing its benefits. If growth is inclusive, the income of the poorest groups will increase faster than the population average, resulting in a significant reduction in poverty rates.

Mechanisms that support inclusive growth include the creation of new jobs in labor-intensive sectors, increased access to markets and capital, and the provision of adequate public services. Conversely, if economic growth is concentrated in capital intensive sectors or only benefits high-income groups, its impact on poverty reduction will be minimal and may even widen the income gap between social groups. Therefore, the direction and quality of growth are determining factors in the effectiveness of development policies aimed at poverty eradication (Ravallion, 2001).
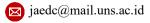
4. CONCLUSION

This study aims to examine the relationship between investment of metal mining and industry and exports of metal and their derivatives on poverty levels, considering the role of economic growth as a mediating variable. The findings show that both investment and exports have a direct effect on economic growth. However, only investment has been proven to have a significant impact on poverty reduction. Conversely, neither investment nor exports have a significant indirect effect on poverty through economic growth. These findings indicate that the benefits of increased investment and exports have not been distributed evenly across all segments of society, especially low-income groups. Economic growth tends to be exclusive, requiring policy interventions that support access to quality education and health services, increased labor productivity, the creation of broad employment opportunities, and the strengthening of labor-intensive sectors as a basis for more equitable and inclusive growth.

The limitations of this study, which only focuses on analyzing the impact of investment and exports in the mining and metal industries on poverty reduction, open up opportunities for further studies to explore alternative variables. Further research should consider other factors such as government spending, access to education, and quality of health services, which theoretically and empirically have the potential to contribute significantly to poverty reduction, particularly in nickel-producing regions in Indonesia. Such a more comprehensive approach is expected to capture socio-economic dynamics more fully and deeply.

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