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Research Article

How Public and Private Investment Reduces Poverty: A Case Study of Provinces with Nickel Production in Indonesia

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Abstract.

This study aims to determine the impact of government and private investment on poverty rates in Indonesia's nickel-producing provinces (South Sulawesi, Central Sulawesi, Southeast Sulawesi, and North Maluku). By utilizing the panel data analysis approach from 2013 to 2022, we can observe how the realization of Foreign Investment (PMA), Domestic Investment (PMDN), and Government Investment (BM) affects poverty reduction. The study's findings suggest that Domestic Investment (PMDN) has considerable impact on poverty reduction. Meanwhile, the realization of Foreign Investment (PMA) and Government Investment (BM) had no substantial impact on poverty reduction in nickel-producing provinces. Along with the increase in the amount of foreign investment and government investment in nickel-producing provinces in Indonesia, research shows that the results do not have a significant effect on alleviating poverty in these nickel-producing provinces. So investment must be encouraged to be more inclusive or encourage labor-intensive investment. The government and corporate sector can utilize this information to help determine the direction of investment in Indonesia's nickel-producing provinces.

Keywords: poverty, foreign direct investment, domestic direct investment, public investment

1. Introduction

According to data from the Ministry of Energy and Mineral Resources in 2020, Indonesia has one of the world's greatest nickel reserves. Indonesia possesses at least 72 million nickel (Ni) reserves, including limonite, which represents 52% of the world's total nickel reserves of 139,419,000 tons Ni. Nickel mining activities are dispersed throughout four provinces, which account for 90% of total nickel reserves in Indonesia. These provinces are Central Sulawesi, South Sulawesi, Southeast Sulawesi, and North Maluku, Indonesia's largest nickel producer [1]. Nickel mining activities have become more massive since nickel is used as a raw material for electric vehicle batteries. As a result, the Indonesian government issued restrictions limiting nickel exports, which went into effect on January 1, 2021. The export restriction is intended to encourage the development of downstream

How to cite this article: Ullya Vidriza*, and Daniel Ananta Talmera, (2024), "How Public and Private Investment Reduces Poverty: A Case Study of Provinces with Nickel Production in Indonesia" in *The 3rd Jakarta Economic Sustainability International Conference*, KnE Social Sciences, pages 211–222. DOI 10.18502/kss.v9i20.16514

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processing capacity that will add value to nickel, which means that nickel will not be exported as raw material. It is hoped that this regulation will increase investment coming into nickel-producing areas, not only domestic investment but also foreign investment. Nickel mining activities have indeed brought in new investment both foreign Direct Investment and Domestic Direct Investment [2].

Investment is the amount of expenditure by the private sector for the purchase of goods and services to increase the stock used or for production expansion which is used as an instrument to measure the size of the Private sector's role in the economy [3]. Foreign Investment (PMA) is an activity to bring in capital or investment, with the aim of carrying out business activities with a complete composition of foreign capital or in joint ventures with domestic investors. Foreign investment must be based on the substance, methods, and circumstances outlined in the appropriate laws and regulations and mandated by the Indonesian government. So that in Indonesia a Legal Entity is required for Foreign Investment [4].

According to Law No. 25 of 2007 on Capital Investment, Foreign Investment (PMA) refers to foreign payment instruments that are not part of Indonesia's foreign exchange riches and are funded by the government. Tools for business, including inventive innovations by foreigners and materials brought into Indonesian territory, as long as they do not come from Indonesia's foreign exchange reserves. A specific amount of the company's result based on this law are expected to be transferred and used by finance firm in Indonesia [5]. Foreign investment includes investment in real production assets in the form of factories, various kinds of capital goods, land, foreign inventory equipment, and so on. The acquisition of foreign money is frequently followed by the execution of management functions, and the investors themselves retain authority over the funds that they have invested [6].

Domestic investment (PMDN), as defined by Law No. 25 of 2007, is an investment activity in which domestic investors use domestic capital to conduct business on Indonesian territory. Domestic investment can be done through commercial entities, such as legal entities, non-legal entities, or individuals, subject to the rules of the law. The objectives of organizing capital investment in Indonesia, both PMA and PMDN, based on Law Number 25 of 2007 concerning Capital investment aims to: (1) increase growth in economy, (2) creating jobs, and (3) promote long-term economic development. (4) Improving the competitiveness of the national business community. (5) Increasing the nation's technological capability and capabilities. (6) Promoting the growth of the individual economy. (6) Converting the potential economy into real economic strength

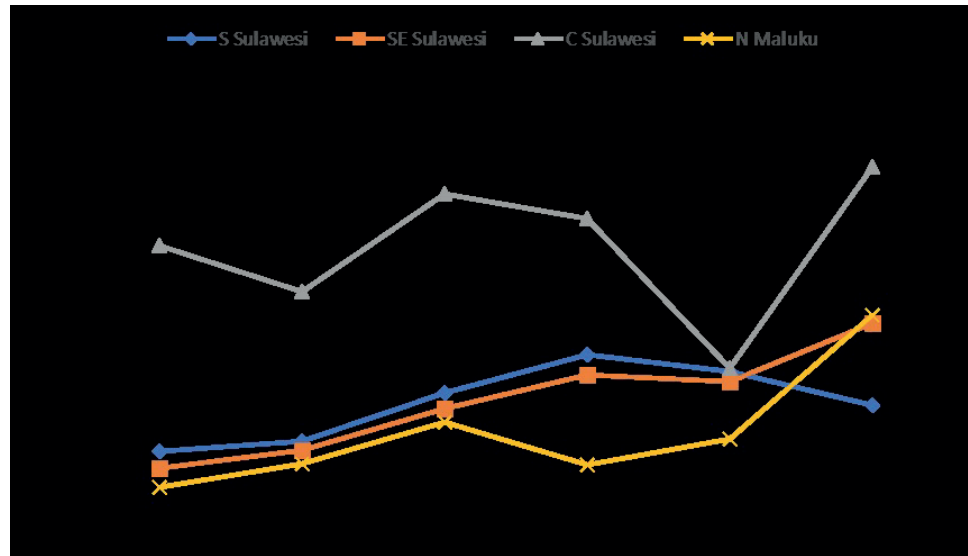through the use of finances from both domestic and international sources. (7) Enhancing communal welfare.

Figure 1: Foreign Direct Investment Realization 2017-2022 In Indonesia's nickel Producing provinces (In Million US Dollar) [Source: Central Bureau of Statistics, 2023].
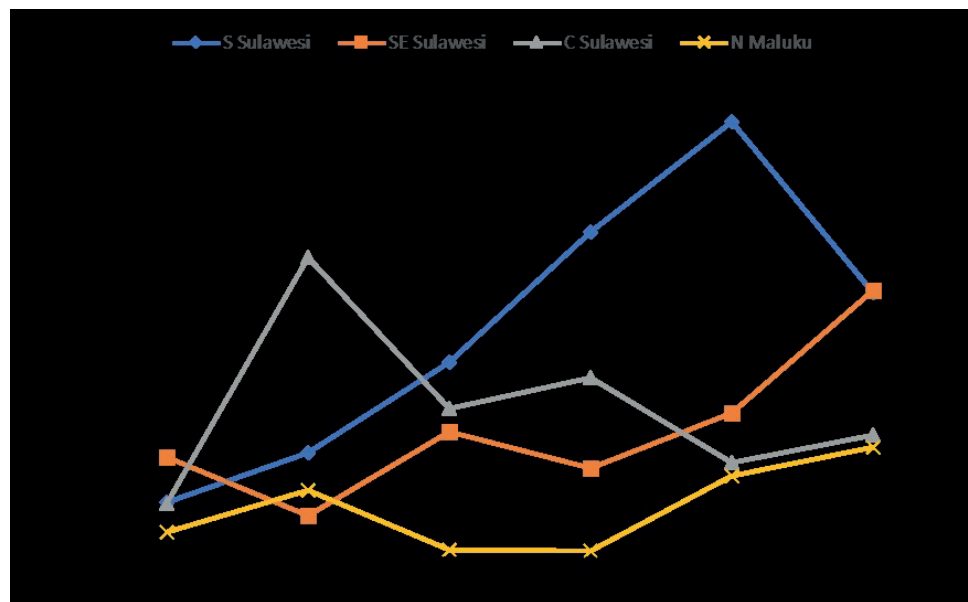

Figure 2: Domestic Direct Investment Realization 2017-2022 In Indonesia's nickel producing provinces (In Billion Indonesian Rupiah) [Source: Central Bureau of Statistics, 2023].

From the Figure 1 and Figure 2 both realization of Foreign Direct Investment (PMA) and Domestic Investment (PMDN) has been continued to increase in the four provinces where continuous increase occurred in Southeast Sulawesi and North Maluku. In 2017 realization of Foreign Direct Investment in Southeast Sulawesi was 238 million US Dollar, and Realization of Domestic Direct Investment was 3.148 Billion Rupiah, then in 2022

the realization of Foreign Direct Investment becomes 1.090,7 million US Dollar, while the realization of Domestic Direct Investment is 7.596 Billion Rupiah. Also, in North Maluku in 2017, the realization of Foreign Direct Investment was 121,7 million US Dollar, and the realization of Domestic Direct Investment was 1150 Billion Rupiah, then in 2022 the realization of Foreign Direct Investment becomes 1.136,5 million US Dollar, while the realization of Domestic Direct Investment is 3.414 Billion Rupiah. The recent increase in investment will undoubtedly boost economic growth. The Economic growth of South Sulawesi increases from 4.16% in 2021, to 5.42% in 2022. Central Sulawesi will increase from 11,7% in 2021, to 15.47% in 2022. Southeast Sulawesi also experienced an increase in economic growth from 4,1% in 2021, to 5,53% in 2022. And the economic growth of North Maluku also increases from 16,79% in 2021, to 22,94% in 2022.

Despite significant investment and economic expansion in many places, people's living conditions have remained relatively stable. South Sulawesi, Central Sulawesi, Southeast Sulawesi, and North Maluku have not seen a major decline in their poor populations. The rate of poor citizens in Central Sulawesi and Southeast Sulawesi has remained above 10% in the last five years. The rate of poor citizens in Southeast Sulawesi in 2018 is 11,32%, and become 11,27% in 2022, and the rate of poor citizens in Central Sulawesi in 2018 is 13,69% and only decreased to 12,3%, this statistic is higher than the national average, which is 9.57% in 2022.
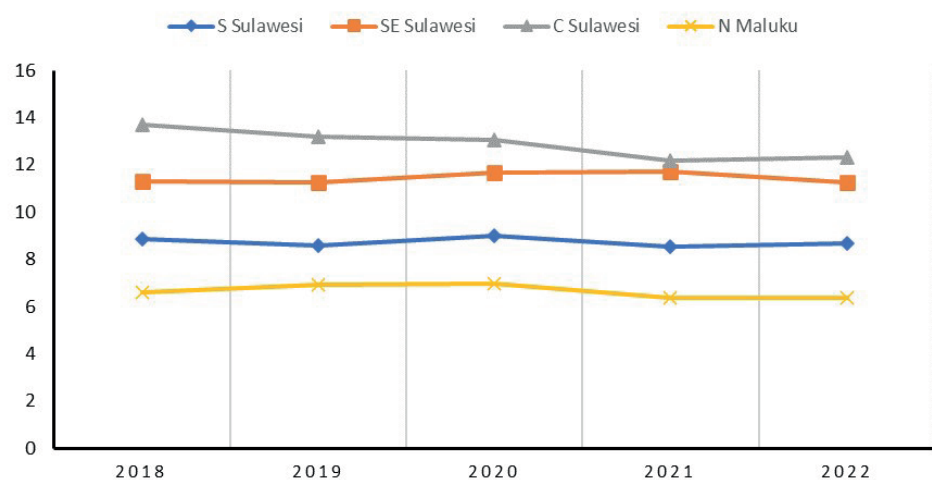

Figure 3: The percentage of poor population 2018-2022 In Indonesia's nickel producing provinces **(**Source: Central Bureau of Statistics, 2023).

This is of course a concern where investment is coming in massively but looks like it has not been able to contribute much to the economy of these regions, especially for reducing poverty. Foreign and domestic investment are the most important sources of

revenue for emerging countries, and they might improve regional economic development. The increase in investment followed by new technology will increase aggregate demand and regional income. With them, regions can develop goods and services that can create jobs, increase people's income and reduce poverty. Thus, investment inflows can reduce the amount of individuals living below poverty levels [7]

Besides, public investment by the government is part of regional expenditure which also has an impact on community welfare and poverty reduction through various budgeted poverty reduction programs [8]. Public investment boosts the regional economic development properly, so that economic growth increases faster. Public investment including infrastructure spending such as buildings, irrigation and roads will certainly support regional economic activities, thereby attracting private investment into the regions whose results will certainly absorb the supply of labour, reduce the unemployment, and finally lower the poverty number [9].

2. Literature Review

Investment and decreasing poverty are inseparable [10]. Investment has a greater impact on poverty reduction than aid, trade terms, or governance. The relation is slightly greater when poverty is high and prevalent in poor nations such as Sub-Saharan Africa and South Asia, regardless of inequality level. Increases in private and public investment are especially strongly related to swift poverty reduction. Another study conducted by [11] identified the components of national expenditure that have the highest elasticity in poverty alleviation. The results of an analysis of provincial growth and poverty statistics in Indonesia show that only private sector, investment and government expenditures have a significant impact on decreasing poverty. This research also did not find a significant difference in poverty elasticity between government spending and investment. To encourage private sector growth, governments must strike a balance between maintaining sufficient public spending and implementing efficient business policies. Then, [12] look at the direct and indirect effects of Foreign Investment (PMA), Domestic Investment (PMDN), and government investment on poverty and economic growth in Central Sulawesi Province. The first hypothesis's findings reveal that Foreign Investment (PMA) and government investment have a direct impact on poverty levels in Central Sulawesi, however Domestic Investment (PMDN) has no direct impact. The second hypothesis test shows that international, domestic, and government investment all have an indirect impact on poverty levels in Central Sulawesi through economic growth.

Another study [13,14] used cross-country data to assess the effects of government spending in various sectors on the US$1-a-day poverty headcount while controlling for GDP per capita. They find that increased government spending on education, agriculture, housing, and amenities (water, sanitation, and social security) all have a negative and statistically significant impact on poverty, presumably by shifting income distribution in a pro-poor direction, given that the level of aggregate income is held constant in their regressions.

Based on the phenomena described, theories, and previous studies on investment and its impact on poverty rates. The independent variable in this study focuses solely on private and government investment, which are looking for evidence of the link between public and private investment and poverty reduction in nickel-producing provinces in order to support development initiatives aimed at reducing poverty through private investment incentives.

3. Research Method

We have developed a series of models to investigate the relationship between government spending, private investment, and poverty. This study used cross-sectional data from South Sulawesi, Central Sulawesi, Southeast Sulawesi and North Maluku collected between 2013 to 2022. Based on past research we can develop the following models:

$$Pov = \alpha + B1PMA + \beta2PMDN + \beta3BM + e \tag{1}$$

Pov represents the variables of the number residents is classified as a poor citizens in South Sulawesi, Central Sulawesi, Southeast Sulawesi and North Maluku from 2013 to 2022. Poverty is measured by the Central Bureau of Statistics (BPS) using the idea of the ability to meet basic necessities. This notion alludes to the Handbook of poverty and inequality issued by the World Bank. Resident are considered impoverished if their average monthly spending per capita falls below the poverty level. *PMA* is the variable that reflects the realization of total Foreign Direct Investment in Indonesia's nickel producing provinces from 2013 to 2022 in US dollars. *PMDN* is the variable representing the total amount of Domestic Investment realized in Indonesia's nickel producing provinces from 2013 to 2022 in Indonesian Rupiah. *BM* is the variable representing the total amount of public investment in Indonesia's nickel producing provinces from 2013 to 2022 in Indonesian Rupiah. Then all variable data is converted in neutral log form, then the model becomes as follows:

$$LnPov_{it} = \alpha + LNB1PMA_{IT} + LNB2PMDN_{IT} + LNB3BM_{IT} + e_{it} \tag{2}$$

4. Results and Discussion

4.1. Panel Data Regression Model Selection

Using the Chow Test, we can select the best panel model among the common effect and fixed effect models. The result of the Chow test will be shown below:

$$Chow\ testF(1,3) = 41,92 \quad Prob{>}chi^2 = 0.0000$$

The Chow Test findings shows a probability value of 0.0000 < 0.05, indicating that H_0 is the common effect model, whereas H_1 is the fixed effect model. Fixed effects regression, as defined by Baltagi (2015) is an estimating approach used in a panel data environment to correct for time-invariant unobserved individual characteristics that can be linked with observed independent variables. As a result, the Fixed Effect model utilized accounts for cross-sectional effects.

4.1.1. Classical Assumption Testing Results

4.1.1.1 Heteroskedastic Test

In fixed-effect regression models, we employ the Modified Wald test to assess groupwise heteroskedasticity. It is a modified Wald test that searches for correlation between the fixed effect regression model's residuals. It is calculated as the sum of squared residual under the null hypothesis of homoscedasticity divided by the total of squared residuals under the alternative hypothesis of groupwise heteroskedasticity. The result of the modified Wald test may be seen in the table below:

TABLE 1: The Modified Wald test for Heteroskedastic.

H0: sigma$(i)^2$ = sigma^2 for all i
chi^2 (4) = 6.82
Prob>chi^2 = 0.1457

From the result of The Modified Wald we can conclude that the value of Prob. F is greater than 5% level of significance then H_0 is accepted which means there is no heteroscedasticity.

4.1.1.2 Autocorrelation Test

To determine whether there is a realationship between the variabels in the prediction model and changes in time, we employ The Wooldridge test for autocorrelation in panel data as a first-order autocorrelation test. The null hypothesis states that there is no first-order autocorrelation. The results of Wooldridge test can be seen in the table below:

TABLE 2: The wooldridge test for autocorrelation.

Wooldridge test for autocorrelation in panel data H0: no first-order autocorrelation
F(1, 3) = 0.187
Prob > F = 0.6948

Based on the results, we accept the null hypothesis of no serial association at 5% level of significance. As a results, the model exhibits serial correlation difficulties.

4.1.1.3 Regression Analysis Results

The result of Fixed Effect panel data regression can be seen at table below:

TABLE 3: Regression Analysis Results.

Variable	Coefficient	t-Statistic	Prob.
C	5.869289	-2.28	0.000
PMA	-.0166543	-0.82	0.420
PMDN	-.0054526	-0.31	0.029
BM	-.0083106	18.91	0.759
R^2	0.5049		

According to the results we can create models below:

$$Pov = 5.869289 - -0.0054526 PMA_{IT} - 0.0166543 PMDN_{IT} - -0.0083106 BM_{IT} \quad (3)$$

Based on the results of regression estimation the table shows an R-squared value of 0.5049, indicating that the independent variable consisting of Foreign Direct Investment Realization (*PMA*), Domestic Direct Investment Realization (*PMDN*) and Public Investment *(BM)* can explain the dependent variable (*Poverty*) by 50,49% with the remaining 49,51% is explained by other variables outside the model. The coefficient value of all independent variables is negative indicating that increasing independence will reduce the variable of Poverty. When the Foreign Direct Investment Realization (*PMA*) increase

1% over year, the number of Poverty *(Pov)* reduced by 0,0166%. Also, when Domestic Direct Investment Realization *(PMDN)* increase 1% over year, the number of Poverty *(Pov)* reduced by 0,00545%. And increasing 1% of Public Investment *(BM)* reduced the number of poverties by 0.00831%.

From the model above we can see that two-tail p-values of variable Foreign Direct Investment Realization *(PMA)* are 0,420, which is greater than 5% level of significance, implying that the variable has no significant effect on poverty reduction. Similarly, the two-tail p-values of the variable Public Investment *(BM)* are 0,759, which indicates that there is no significant effect on Poverty reduction *(Pov)*. While variable Domestic Direct Investment Realization *(PMDN)* has p-values 0,029 lower than 5% level of significance show that Domestic Direct Investment Realization has significant effect on Poverty reduction.

4.2. Discussion

Based on the panel regression result above, it can be explained that each Independent Variable partially impacts on Poverty. The variable of Foreign Direct Investment Realization *(PMA)* has negative and not significant effect on the reduction of poverty. Besides, Domestic Direct Investment Realization *(PMDN)* has a negative and significant effect on the reduction of poverty, although the reduction is just a small amount. These results are different from research conducted by [15] which found that Foreign Investment *(PMA)* significantly has a positive effect on the Poverty Level in Indonesia. While, [16] found that Public investment *(BM)* has a positive but not significant effect on poverty in research conducted in East Kalimantan using time series data from 2007 to 2020.

The factor that causes Foreign Direct Investment Realization *(PMA)* and Domestic Direct Investment Realization *(Pmdn)* have not been able to play a role in alleviating poverty in South Sulawesi, Central Sulawesi, Southeast Sulawesi and North Maluku because Foreign and Domestic Direct Investment is more dominant in the downstream sector, which is a capital-intensive and technology-intensive investment rather than labour-intensive which requires experts and high-skilled workers who are not available in these regions so they are brought from outside the regions and even from abroad, causing local manpower not to be used.

The findings also show that partial realization of government investment has no substantial impact on poverty reduction in Indonesia's nickel producing provinces. These findings differ from those of [17] who used secondary data from 2008-2020 to investigate the impact of two variables (investment and government expenditure) on

poverty reduction. The data revealed that investment has a negative and significant impact on the number of impoverished people in Indonesia, whereas government spending has an influence and is regard. Both investment and government spending have an impact on the number of poor people in Indonesia.

Regional Development Coordination Meeting and Acceleration of Infrastructure Development in North Maluku Province in 2021 revealed that the infrastructure for the public basic service in North Maluku is inadequate and evenly distributed, starting from internet access, regional competitiveness, the availability of roads as supporting infrastructure for connectivity, to the leverage of inter-regional transportation.

5. Conclusion

The high poverty rate in Indonesia's nickel producing provinces can be attributed to the influence of non-inclusive investments on labour demand. This signifies that the local community has yet to benefit from investment's multiplier effect. As a result, unemployment rates in this nickel production Province are still high and poverty is increasing. Therefore, the government must encourage more inclusive investments, such as investor commitments to absorb more local workers and increase the transfer of knowledge and technology between foreign skilled workers to local workers.

Infrastructure limitations clearly result in the utilization of economic potential and resources being less than optimal, and even difficult to develop to the expected level. Such conditions require the government to allocate a relatively large budget to build and provide infrastructure. Based on the results of data analysis, the government needs to formulate a policy that encourages the development of basic infrastructure such as roads, electricity and sanitation services with adequate equitable access to overcome poverty. The government also has to intensify public investment for public training and education. The central and regional governments must collaborate to prepare the local labor force to meet the quality standards of their respective regions' industrial sectors.

Because the limitation of this research is that it only focuses on the influence of private and government investment on reducing poverty, it is a consideration for future research to find other variables that might have an influence on reducing poverty rates in nickel-producing provinces in Indonesia. Apart from that, the results of this research will be useful for the government and private sector in determining the size and direction of investment.

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