

Research article

# Does the Manufacturing Industry Reduce Poverty on Sumatra Island?

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**Abstract:** Poverty alleviation is an important priority for governments. Encouraging manufacturing growth is often seen as an effective strategy to alleviate poverty. However, the impact of such growth on poverty rates in Sumatra Island remains unclear. This study analyzes the impact of manufacturing growth on poverty rates in 10 provinces in Sumatra Island, using secondary data from 2008 to 2022. Using the quantitative approach and panel data regression analysis, the results show that industrial growth in Sumatra Island, although not significant, has an impact on poverty reduction. However, industrial growth can indirectly absorb labor. Labor and education variables have a negative and significant effect on poverty. These findings highlight the need for policy interventions focusing on vocational education and training, infrastructure improvement, economic diversification, labor policies, and local community empowerment to effectively reduce poverty.

**Keywords:** manufacturing industry, poverty, income, labor, education

**JEL Classification:** L10, I30

**Abstrak:** Pengentasan kemiskinan merupakan prioritas penting bagi pemerintah. Mendorong pertumbuhan manufaktur sering dipandang sebagai strategi yang efektif untuk mengentaskan kemiskinan. Namun, dampak dari pertumbuhan tersebut terhadap tingkat kemiskinan di Pulau Sumatera masih belum jelas. Penelitian ini bertujuan menganalisis dampak pertumbuhan manufaktur terhadap tingkat kemiskinan di 10 provinsi di Sumatera, dengan menggunakan data sekunder dari tahun 2008 hingga 2022. Dengan menggunakan pendekatan kuantitatif dan regresi data panel. Hasil penelitian menunjukkan pertumbuhan industri di Pulau Sumatera, meskipun tidak signifikan berdampak pada penurunan kemiskinan. Namun secara tidak langsung adanya pertumbuhan industri dapat menyerap tenaga kerja. Variabel tenaga kerja dan pendidikan berpengaruh secara negatif dan signifikan terhadap kemiskinan. Temuan-temuan ini menyoroti perlunya intervensi kebijakan yang berfokus pada pendidikan dan pelatihan vokasional, peningkatan infrastruktur, diversifikasi ekonomi, kebijakan tenaga kerja, dan pemberdayaan komunitas lokal untuk mengurangi kemiskinan secara efektif.

**Kata kunci:** industri manufaktur, kemiskinan, pendapatan, tenaga kerja, pendidikan

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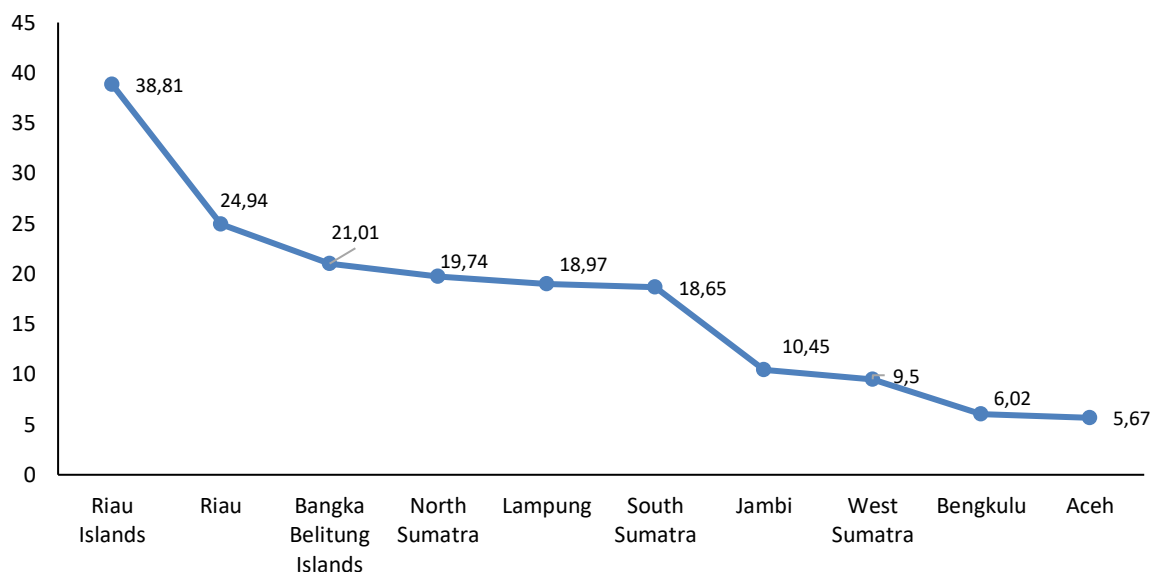
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## 1. INTRODUCTION

Sumatra is one of the islands in Indonesia that is rich in natural resources, both in agriculture and mining. The contribution of primary industry still dominates the economic growth of the provinces in Sumatra Island. However, the role of manufacturing continues to make an important contribution along with the downstream program in the national planning agenda. Highlighting the average contribution of the manufacturing industry in various provinces in Sumatra Island from 2018 to 2022. Riau Islands leads with a sizable contribution of 38.81 percent, mainly driven by the metal

goods, computers, electronic goods, optical equipment, and electrical goods industries. In Riau Province, the food and beverage industry made a sizable contribution of 24.94 percent, while in Bangka Belitung Islands Province, the food and beverage industry and basic metals dominated with a contribution of 21.01 percent (Figure 1).



**Figure 1.** The Contribution Average of the Processing Industry Sector in Sumatra Island, 2013-2022  
**Source:** Statistics Indonesia, 2023

North Sumatra and Lampung provinces show similar contributions around 20 percent, reflecting a balanced industrial presence. South Sumatra, Jambi, and West Sumatra show a gradual decline in manufacturing contribution, with 18.65 percent, 10.45 percent, and 9.5 percent, respectively. This trend continues with Bengkulu at 6.02 percent and Aceh at the lowest by 5.67 percent, indicating a varied industrial landscape across the island. In 2022, Sumatra's gross domestic product (GDP) contributed 22.04 percent to Indonesia's national GDP, with the manufacturing sector accounting for 19.07 percent of Sumatra's total GDP. This places Sumatra as the second largest contributor to national gross regional domestic product (GDP), after Java. The important role of manufacturing in Sumatra's economic framework underscores its significant impact on economic growth, job creation and employment opportunities. Differences in manufacturing contributions across provinces indicate varying levels of industrial development and specialization, which in turn affect regional economic dynamics and growth potential.

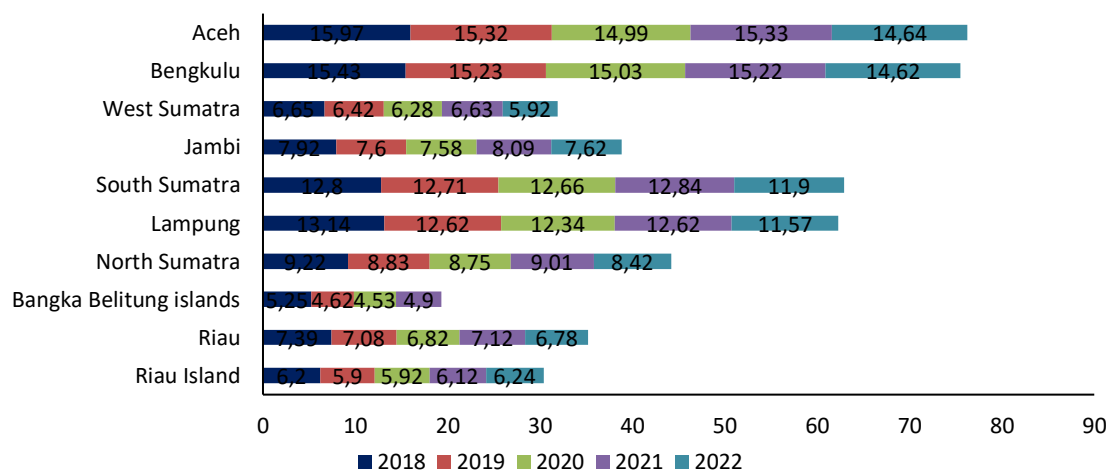
This economic development process entails alterations in the configuration of production and resource utilization (Surya et al., 2021). Pham & Riedel, (2019), examined the impact of sectoral economic growth and other factors on poverty alleviation in Vietnam from 2010 to 2016. Their findings indicated that increasing the proportion of industry and agriculture had a significant impact on poverty alleviation. Conversely, the increasing proportion of the service sector was associated with higher poverty rates. Additionally, the study revealed that economic growth did not lead to significant poverty reduction. Conversely, the process of urbanization, an increase in the labor force, and an expansion of literacy rates have a positive impact on the achievement of poverty alleviation. Finally, population growth represents one of the reasons that hampers the success of the poverty alleviation process in Vietnam.

Karahasan (2023); Haraguchi et al. (2017); and Mukhlis et al. (2017), posit that the industrialization process is associated with higher per capita income, which is then anticipated to result in a shift towards a more egalitarian distribution. Abisuga-Oyekunle (2019), additionally asserts that, in addition to fostering economic growth, structural changes also influence the creation of new jobs. This implies that poverty can be overcome and reduced. The transformation and modernization of the industrial structure is regarded as an essential means of achieving a

breakthrough from the "poverty trap" (Pang et al., 2023). Pratomo & Manning (2022), found that the industrial sector contributes significantly to Central Java's economic growth and has the largest labor force among other sectors. Consequently, it is important to reduce the number of poor people in Central Java. In contrast to Wibisono (2018), their findings indicate that the manufacturing sector has a significant impact on economic growth, but does not have a direct impact on people's welfare.

The industrial sector is one of the sectors whose products play an important role in supporting the national economy. Consequently, industrialization strategies are frequently employed to achieve community welfare (Afolabi & Laseinde, 2019; Opoku & Yan, 2018). As stated by Yang et al. (2023) and Soylu et al. (2018), the industrial sector endeavors to enhance societal well-being and quality of life through the judicious utilization of diverse resources, including natural resources, labor, capital, and other factors. The establishment of this industry is anticipated to generate employment opportunities for the unemployed and stimulate economic growth. Gherghina et al. (2020) and Song et al. (2023), demonstrate the pivotal role of the manufacturing industry in driving economic growth. The manufacturing industry plays a crucial role in the revitalization of the local economy, as industrial development drives the growth of other sectors. This is expected to create more jobs, absorb more labor, and ultimately increase the total income of the community. This is because economic growth is generally characterized by an increase in per capita income. The industrial sector plays an important role in economic development because it is considered to have advantages in accelerating development Soylu et al. (2018). Meanwhile, Pusra et al. (2021) state that industrial development can help economic growth and poverty alleviation by encouraging the absorption and mobilization of labor from other sectors. The findings of Chen & Yang (2023), study on company observations in industrial groups indicate a significant correlation between industrial dynamism and the impact of companies on poverty. Industrial dynamism is negatively correlated with the company's contribution to poverty alleviation. On the one hand, there is a significant positive correlation between the number of state-owned enterprises (SOEs) in an industry and the potential and impact of these enterprises' contribution to poverty alleviation.

Despite the growing importance of the manufacturing sector, Sumatra Island continues to experience a high poverty rate. In 2022, Sumatra Island is ranked second only to Java as the island with the highest number of poor people. The fluctuations in the change of poverty in Sumatra from 2018 to 2022. The highest poverty rate was recorded in 2021, the second year of the COVID-19 pandemic, after previously showing a downward trend. In 2022, the poverty rate declined again in all provinces as the economy recovered from the effects of the pandemic. Four provinces still exhibit poverty rates above the national average: Aceh, Bengkulu, South Sumatra, and Lampung. According to Wan et al. (2021) and Liu et al. (2018), the slow decline in poverty in these provinces is due to poor access to education. Ogundari & Awokuse (2018), observed that human resources have declined not only in quality but also in health and nutritional status, which has an impact on decreasing productivity (Figure 2).



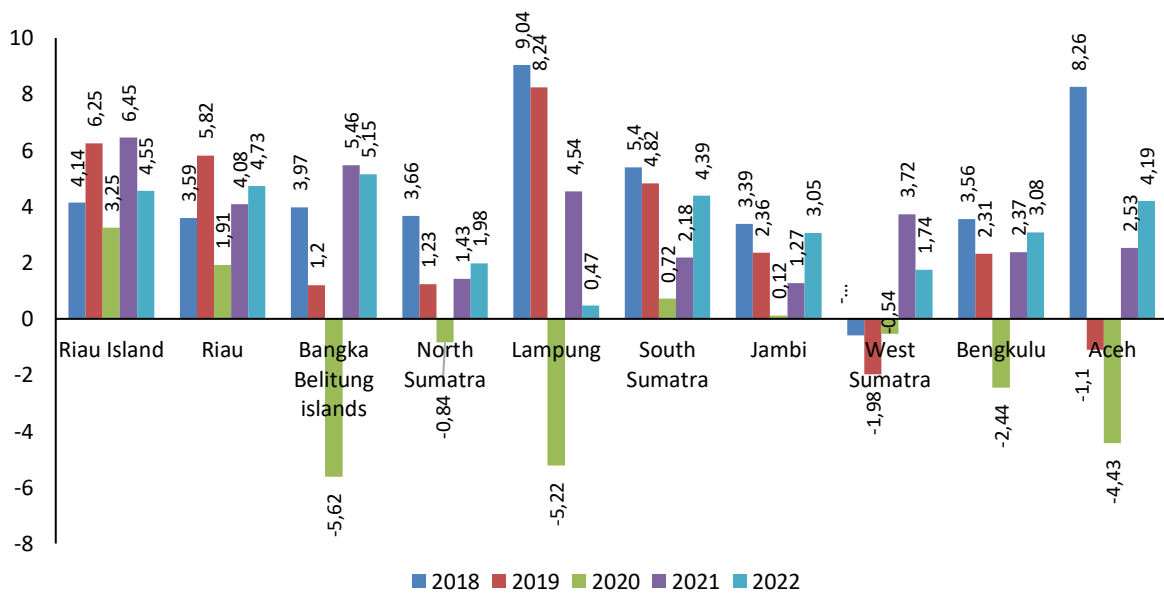
**Figure 2.** The Development of the Poverty Rate in Sumatra Island, 2018-2022

Source: Statistics Indonesia, 2023

As posited by Bischoff & Owens (2019), disparities in capabilities, opportunities, and resources are the root cause of poverty. Adjei et al. (2020), found that poverty alleviation is unattainable due to the inadequacy of human resources, the absence of a comprehensive social protection system, the prevalence of groups affected by social exclusion, and the vast discrepancies between regions and social groups, among other factors. Changes in environmental sustainability, gender disparities, and differences in poverty and vulnerability between men and women and between age groups.

As outlined by Karahasan (2023), the distribution of industrial actors also contributes to the economy and is related to income distribution between communities. Industrial value added through increasing the share of manufacturing is an important factor in poverty alleviation activities (Enongene, 2023) and (Fabella et al., 2023). China has successfully eradicated extreme poverty through a combination of infrastructure development programs, training initiatives, and business subsidies in rural areas (Zhu et al, 2022).

In addition to the impacts of the COVID-19 pandemic, the negative growth rate of the manufacturing industry in several provinces on Sumatra Island can be attributed to a combination of factors. These include disruptions in the supply chain, fluctuations in global commodity prices, and domestic economic policies that may have hindered industrial activities. The dependency on specific industries, such as oil and gas in provinces like Riau, also contributed to the negative growth when global oil prices fell. Furthermore, infrastructural challenges, such as inadequate transportation networks and energy supply issues, have exacerbated the difficulties faced by the manufacturing sector. Environmental regulations and labor market issues, including strikes and labor shortages, have also played a role in dampening industrial growth. Despite these challenges, the sector has shown resilience, with signs of recovery emerging as provinces adapt to new economic realities and implement measures to bolster industrial activity (Figure 3).



**Figure 3.** Growth of Sumatra Island Manufacturing Industry, 2018-2022

Source: Statistics Indonesia, 2023

A series of studies conducted by Arifai (2023); Raysharie & Saprianto (2022); Opoku & Yan (2018); Pham & Riedel (2019); Abisuga-Oyekunle (2019), and Saci (2023), have revealed a significant negative correlation between the manufacturing industry and the poverty rate. This implies that poverty levels decline in tandem with the expansion of the manufacturing sector. In contrast to the findings of Mustapha et al. (2015) and Ndiaye et al. (2018), which suggest that the number of workers in small and medium industries does not have a significant impact on poverty, recent studies have demonstrated that innovation in the use of technology has led to a reduction in the number of workers required to develop each new industrial sector. The study by Adjei et al. (2020),

found that an increase in Gross Domestic Product (GDP) in the manufacturing industry will increase poverty because the labor force requires higher skills, making it difficult for low-income people to enter this industry. Gordon & Resosidarmo (2018) also found that the growth of manufacturing and service industry sectors in Indonesia has a positive and significant relationship with income inequality. Conversely, Ming-yue et al. (2021), discovered that industrial development in China has an uneven impact on farmers' livelihood capital, with the non-poor being more effectively impacted than the poor.

The existing literature provides extensive insights into the relationship between the manufacturing sector and economic growth, job creation, and poverty alleviation. Studies such as those by Pratomo & Manning (2022) and Gherghina et al. (2020) demonstrate the significant contribution of the manufacturing sector to regional economies and labor markets. However, there is a noticeable gap in understanding the specific impact of manufacturing growth on poverty levels within the context of Sumatra. While some studies indicate a positive correlation between industrial growth and poverty reduction (Arifai, 2023; Opoku & Yan, (2018), others suggest that industrial development might exacerbate income inequality and limit opportunities for low-income populations (Adjei et al. 2020; Gordon & Resosidarmo, 2018). This study aims to bridge this gap by analyzing the effect of manufacturing growth on poverty levels across the ten provinces of Sumatra. By leveraging secondary data spanning from 2008 to 2022, the research seeks to uncover the nuanced relationship between industrial expansion and poverty dynamics. The primary objective is to determine whether the growth of the manufacturing sector has a direct and significant impact on poverty alleviation in Sumatra, considering the diverse economic and industrial landscape of the region.

## 2. RESEARCH METHODS

This study uses panel data from 10 provinces on Sumatra Island between 2008 and 2022 to analyze the impact of manufacturing industry growth, investment, employment, education, and per capita income on poverty in Sumatra. The data used is secondary data obtained from Statistics Indonesia of the provinces on Sumatra Island. Quantitative descriptive analysis techniques are applied using panel regression models. The model used is as follows:

$$POV_{it} = \alpha + \beta_1 GIM_{it} + \beta_2 \ln INV_{it} + \beta_3 LABOR_{it} + \beta_4 EDU_{it} + \beta_5 \ln INCOME_{it} + \varepsilon_{it} \quad (1)$$

where, POV is poverty. GIM is manufacturing industry growth. INV is gross fixed capital formation. LABOR is the percentage of employment. EDU is literacy rate. INCOME is per capita income.  $\alpha$  is a constant,  $\beta_1 \beta_2 \beta_3 \beta_4 \beta_5$  is the coefficient of the independent variable,  $\varepsilon$  is the error term,  $i$  is the province in Sumatera Island and  $t$  is the period 2008-2022.

Before analyzing the model estimation results, the first step is to conduct a unit root test. This test determines whether the time series data used is stationary, which is crucial in econometric analysis to avoid biased results. The classical assumption test ensures that the regression model meets the residual diagnostics, allowing for an accurate interpretation of the model estimation results. Subsequently, the best model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) is identified. To determine the most suitable model, the Chow test and Hausman test are employed.

## 3. RESULTS AND DISCUSSION

Descriptive statistics to obtain an initial overview of the distribution and variation of the data, which will aid in further interpretation and analysis. The POV variable has an average of 2.317, a median of 2.235, a maximum value of 3.158, and a minimum value of 1.492, with a standard deviation of 0.416, indicating that the data variation is not too large. The GIM variable has an average of 1.345 and a median of 1.497. The maximum value is 3.030, and the minimum value is -2.120, with a standard deviation of 0.691, indicating the presence of outlier data and greater

variation compared to the POV variable. The INV variable has an average of 3.550 and a median of 3.750, with a maximum value of 5.155 and a minimum of -0.971. The standard deviation of 1.167 shows considerable variation in the data. The LABOR variable has an average of 14.48 and a median of 14.546, with a maximum value of 15.789 and a minimum of 13.108, and a standard deviation of 0.716, indicating relatively small data variation. The EDUCATION variable has an average of 4.588 and a median of 4.592. The maximum and minimum values are very close, at 4.605 and 4.539 respectively, with a standard deviation of 0.017, indicating very consistent data. The INCOME variable has a mean of 10.296 and a median of 10.286, with a maximum value of 11.403 and a minimum of 8.341, and a standard deviation of 0.607, indicating moderate variation in the data.

**Table 1.** Descriptive Statistics

<b>Variables</b>	<b>Mean</b>	<b>Median</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Std. Dev.</b>
POV	2.317	2.235	3.158	1.492	0.416
GIM	1.345	1.497	3.030	-2.120	0.691
lnINV	3.550	3.750	5.155	-0.971	1.167
LABOR	14.480	14.546	15.789	13.108	0.716
EDU	4.588	4.592	4.605	4.539	0.017
lnINCOME	10.296	10.286	11.403	8.341	0.607

**Source:** Author’s calculations, 2024

The unit root test with the Augmented Dickey-Fuller (ADF) test is a statistical method used to determine whether a time series is stationary or has a unit root trend. Stationary time series have mean, variance, and autocovariance that are constant over time, which is crucial for econometric analysis. In an economic context, stationarity is important because many statistical and econometric analysis methods, such as linear regression, assume that the data used is stationary. Without stationarity, the resulting model may not reflect the true relationship between variables and may provide incorrect predictions. Therefore, the unit root test is a crucial first step in time series analysis to ensure the quality and validity of economic research results.

**Table 2.** Results of Unit Root test

<b>Variable</b>	<b>1<sup>st</sup> Difference</b>		<b>2<sup>nd</sup> Difference</b>	
	<b>Statistics</b>	<b>Prob.</b>	<b>Statistics</b>	<b>Prob.</b>
POV	43.357***	0.000	83.737***	0.000
GIM	56.426***	0.000	83.074***	0.000
lnINV	181.963***	0.000	204.219***	0.000
LABOR	66.295***	0.000	84.614***	0.000
EDU	30.399*	0.064	61.384***	0.000
lnINCOME	201.537***	0.000	180.040***	0.000

Note: \*\*\* significance level 1%, \*\* significance level 5%, \* significance level 10%

**Source:** Author’s calculations, 2024

In the first difference and second difference analyses, all variables (POV, GIM, INV, LABOR, EDU, INCOME) are significant at the 1% significance level, except for the EDU variable in the first difference, which is significance level at the 10% level. This indicates that most variables become stationary after the first difference, while the EDU variable becomes stationary after the second difference (Table 2). Overall, these results indicate that all variables have become stationary. Stationary variables can be used in further econometric analysis to avoid problems associated with non-stationarity, such as invalid or biased estimation results.

Before selecting a model for panel data analysis, it is necessary to test the classical assumptions to ensure the validity of the regression model used. The classical assumptions tested include normality, cross-section dependence, heteroscedasticity, and multicollinearity. First, the normality test using the Jarque-Bera probability shows a probability value of 0.071, which is greater than 0.05.

This indicates that the data is normally distributed, and there is no problem with data normality. Second, in Pesaran's Cross-Section Dependence test, the probability is 0.000. This indicates that there is significant cross-section dependence in the data. Therefore, we reject the null hypothesis of no cross-section dependence and conclude that there is CD test present. Third, the heteroscedasticity test using the White Test shows a probability value of 0.199, which is greater than 0.05. This indicates that there is no heteroscedasticity problem, meaning that the residual variance is constant and does not depend on the independent variables. Overall, the classical assumption test results show that the regression model used meets most of the basic assumptions, and there is no indication of significant classical assumption problems.

In multiple linear regression analysis with panel data, selecting the best model is crucial to ensure accurate estimation results. The Chow test and the Hausman test are used to determine the best model. The Chow test evaluates whether the FEM is better than CEM. Based on the results shown in the table, the probability value for the Chow test is 0.000. Since this value is smaller than 0.05, the null hypothesis ( $H_0$ ), which states that CEM is better, is rejected. Instead, the alternative hypothesis ( $H_1$ ) is accepted, indicating that the FEM is the better model to use.

Furthermore, the Hausman test compares the FEM with the REM. Table 3 shows a probability value for the Hausman test of 0.000. This value is also smaller than 0.05, so the null hypothesis, which states that the REM is better, is rejected. The alternative hypothesis is accepted, meaning that the FEM is the better model to use. From these two tests, it can be concluded that the FEM is the best model to use in multiple linear regression analysis with panel data. Both tests consistently reject the null hypothesis and accept the alternative hypothesis in favor of the fixed effects model.

**Table 3.** Results of Fixed Effects Regression Model

<b>Dependent variable = POV</b>				
<b>Variables</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
Constant	17.710	2.056	8.613	0.000
GIM	0.004	0.009	0.422	0.674
lnINV	-0.020	0.012	-1.738	0.084
LABOR	-0.637	0.087	-7.328	0.000
EDU	-1.246	0.570	-2.186	0.031
lnINCOME	-0.038	0.024	-1.543	0.125
R <sup>2</sup>	0.975			
Adj. R <sup>2</sup>	0.973			
F-statistic	383.193			
Prob(F-statistic)	0.000			
<b>Model selection test</b>	<b>Stat.</b>	<b>Prob.</b>		
Chow	463.999	0.000		
Hausman	53.627	0.000		
<b>Diagnostic test</b>	<b>Stat.</b>	<b>Prob.</b>		
Jarque-Bera	5.283	0.071		
Pesaran CD	5.150	0.000		
White test	91.042	0.199		

Source: Author's calculations, 2024

Industrial growth on Sumatra Island has no statistically significant effect on poverty. Although industries in the region are expanding, the impact on poverty reduction is not immediately felt. One reason for this is that these industries often benefit only a small portion of the population who already possess high skills and adequate education. Sectors such as oil and gas, oil palm plantations, pulp and paper, and manufacturing require workers with specialized qualifications that most of the local population does not have. Consequently, many residents remain in traditional and underdeveloped sectors that pay low wages (Gindling, 2018).

However, labor has a negative and significant effect on poverty. This means that an increase in the labor force in a region can contribute to a decrease in poverty. When more people work, household incomes increase, thereby reducing poverty. The absorption of labor in a growing industry can reduce unemployment and improve people's welfare. These results are in line with research by Zulher & Ratnasih (2021), on employment opportunities, and provincial minimum wages and their effect on poverty rates in Indonesia. Geremewe (2018) and Adanlawo (2021) industries, both small and medium, are basically established with the aim of poverty alleviation. These enterprises have a very important and effective role in both developed and developing countries as they are considered the backbone of their economies. The existence of enterprises can play a role in improving the socio-economic conditions of the poor, creating employment opportunities, creating greater employment by utilizing local raw materials, and increasing the economic growth of the country.

Education level also has a negative and significant effect on poverty. The analysis shows that higher education levels significantly contribute to poverty reduction. Education provides the skills and knowledge needed to obtain higher-paying jobs. Increased education also enables the population to adapt to changes in technology and labor market needs, including those in fast-growing industries. Investment in education, especially vocational education relevant to industry needs, is critical to ensure that the local population can compete and benefit from industry growth. Better education can also encourage innovation and entrepreneurship, which in turn can create new jobs and reduce poverty. Following the findings of Bukhari et al. (2021); Hofmarcher (2021) and Liu et al. (2023) there is a strong correlation between the education level of industrial sector workers and poverty rates in developing countries.

Our findings also show that income does not have a significant effect in reducing poverty, implying that income is not the only determining factor. There may be other factors that are more important, such as, adequate access to health services, education, and clean water as well as economic instability and natural disasters that can push people to the brink of poverty. These findings are consistent with the results of studies conducted by Stephen & Simoen (2013) and Akpan et al. (2016) found that income is not something that can remove a household from the trap of poverty, if they are unable to get access to quality education and health.

In summary, industrial growth on Sumatra Island does not directly impact poverty reduction, as it often benefits only a small portion of the population with high skills and adequate education. However, increasing the percentage of the workforce and improving education levels significantly contribute to poverty reduction. Therefore, investment in education and vocational training is essential to ensure that the local population can compete and benefit from industrial growth, ultimately reducing poverty in the region.

**Table 4.** Intercept Results of Provinces in Sumatera Island

Province	C-Province	Constant	Intercept	Rank
Lampung	0.788	17.710	18.499	1
North Sumatra	0.764	17.710	18.474	2
South Sumatra	0.743	17.710	18.453	3
Aceh	0.564	17.710	18.275	4
Riau	0.003	17.710	17.713	5
Bengkulu	-0.022	17.710	17.688	6
West Sumatra	-0.200	17.710	17.511	7
Jambi	-0.370	17.710	17.34	8
Riau Island	-0.902	17.710	16.808	9
Bangka Belitung Island	-1.368	17.710	16.342	10

Source: Author's calculations, 2024

Lampung Province ranks first with the highest intercept value of 18.499, indicating the highest poverty rate on Sumatra Island where other variables are held constant. The average poverty rate in Lampung Province from 2008 to 2022 was 15.13%. Contributing factors include limited access to



education and health services, dependence on the less productive traditional agricultural sector, inadequate infrastructure, limited employment opportunities in the formal sector, and uneven economic development between urban and rural areas. In contrast, the Bangka Belitung Islands Province has the lowest poverty rate on Sumatra Island, with an intercept value of 16.342. This indicates that the population in this province is more prosperous compared to other provinces in the region. The average growth rate of the manufacturing industry in the Bangka Belitung Islands is 2.75%. The industrial sector in the Bangka Belitung Islands is experiencing rapid growth, with the metal industry being a significant contributor to this expansion. Similarly, Riau Province's manufacturing industry also showed significant growth, at 5.27%, supported by the metal goods, computer, electronic goods, optical, and electrical equipment industries.

#### **4. CONCLUSIONS**

Industrial growth on Sumatra Island, although not significant, does impact poverty reduction. However, industrial growth can indirectly absorb labor. Labor and education variables have a negative and significant effect on poverty. Better education provides the skills and knowledge needed to obtain higher-paying jobs and enables the population to adapt to technological changes and labor market needs. Lampung Province has the highest poverty rate on Sumatra Island, while Bangka Belitung Islands Province has the lowest. To address poverty on Sumatra Island, policies should include investing in vocational education and training, improving infrastructure, promoting economic diversification, enhancing labor policies, empowering local communities, and improving access to basic services. Investment in education and vocational training relevant to industry needs is crucial to ensure that the residents can compete and benefit from industry growth. Improvements in basic infrastructure such as roads, electricity, and internet access are also needed to support economic growth and provide better access to education and health services.

Economic diversification should be encouraged to avoid relying solely on one or two industrial sectors and to develop other sectors such as modern agriculture, tourism, and services. Labor policies need to be improved through training and certification programs to enhance the quality and quantity of the local workforce. Empowering local communities through skills development programs and providing business capital for small and medium enterprises are also important to improve local residents' access to economic opportunities. Additionally, improved access to quality health services, especially in rural and remote areas, can reduce the health burden of the poor. With a holistic approach that includes improving education, vocational training, infrastructure, and economic diversification, the right policies can ensure that industrial growth provides more equitable benefits to the entire population, thereby contributing to the reduction of poverty rates on Sumatra Island.

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