



## **Analysis of the Contribution of the Processing Industry Sector in Efforts to Reduce Poverty in North Sumatra Province**

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### **ABSTRACT**

*This study aims to analyze the contribution of the processing industry to efforts to reduce poverty in North Sumatra Province, analyze the influence of the number of industries, investment, exports on industrial GDP and the number of population, unemployment on the poverty rate. This study uses secondary data in the form of time series data, 2009-2023, namely data on the number of industries, PMDN investment in the processing industry, Industrial Exports, the number of population, unemployment, Industrial GDP, and poverty in North Sumatra province. The analysis method used is simultaneous regression. The results of the study show that the influence of the number of industries has an impact on the increase in industrial GDP, and the number of population also has an impact on the increase in poverty, then the industrial GDP does not have a significant impact on poverty in North Sumatra Province.*

**Keywords:** *Number of Industries, Investment, Exports, Number of Population, Unemployment, Industrial GDP, Poverty*

### **1. INTRODUCTION**

An essential consideration for a country and its local government is economic development and growth, particularly factors that influence the augmentation of individuals' income. This has a direct bearing on enhancing living standards, alleviating poverty, addressing income disparities, and generating employment opportunities. Developing countries generally hold the belief that the industrial sector has the capacity to address economic challenges, on the assumption that it can guide other economic sectors towards achieving economic progress. Thus, the industrial sector is poised to serve as the primary catalyst and dominant sector for the advancement of other economic sectors, while also promoting the growth of industries associated with it (Saragih, 2004).

The province of North Sumatra consists of 33 districts and cities, and possesses diverse development potential. This potential include market potential, labor force, and natural resources, all of which have witnessed expansion across numerous economic sectors. The processing industry holds the greatest potential for job creation in the real sector. In the event of an economic collapse, the small and medium-scale processing industry is likely to remain resilient. One of the reasons for this is that this business does not heavily rely on loans with high interest rates. The occurrence of the economic crisis prompted the government to realize that a country cannot sustain its economy solely relying on the huge corporate sector (Marsudi, 2005).

Based on data from the business sector in BPS North Sumatra, the processing industrial sector is the second largest contributor to the GDP, following the agricultural sector. The expansion of these industries is shown in the rising GDP of North Sumatra Province. The GDP of North Sumatra Province in 2019 was Rp. 539.51 trillion and it climbed to Rp. 573.52 trillion by 2022. The GDP of the processing industrial sector experienced an increase from Rp. 97.36 billion in 2019 to Rp. 99.86 billion in 2022, according to BPS North Sumatra 2023.

Economic growth and poverty serve as crucial benchmarks for assessing the efficacy of a nation's progress. Each nation will endeavor to attain maximum economic growth and decrease poverty rates. Economic growth is the primary requirement for poverty alleviation in numerous countries worldwide. Nevertheless, in emerging countries such as Indonesia, the economic growth attained is concomitant with the rise of additional issues. Poverty is a significant social issue, particularly in developing nations, such as Indonesia.

Poverty is a multifaceted issue that encompasses multiple dimensions, including socio-cultural and economic factors. The impoverished population experiences annual fluctuations. According to BPS North Sumatra, the number of individuals living in poverty was 1,324,980 million in 2018, but it rose to 1,343,860 million in 2021. In 2023, the population of North Sumatra province is projected to decrease by 1,239,710 individuals, which will be a substantial fall.

The objective of this study is to demonstrate if the industrial activity in North Sumatra has the capability to effectively alleviate poverty, notwithstanding the slow progress observed thus far.

## **2. LITERATURE REVIEW**

### **2.1. Poverty**

Mubyarto (2004) defines poverty as a state of insufficient money that results in the inability to fulfill essential living requirements, including clothing, shelter, food, healthcare, and education. Adisasmita (2005:192) defines poverty as having a wide-ranging significance and can be assessed through several methods. There are two often employed indicators to measure poverty: absolute poverty and relative poverty. Estimated income levels and needs are always linked to absolute poverty. Estimated needs refer exclusively to essential requirements or the bare minimum necessary for a person to sustain a respectable standard of living. Relative poverty refers to those who possess an income that is sufficient to fulfill their essential minimal requirements, but this does not necessarily imply that they are not impoverished. If an individual's income only meets the bare minimal requirements for basic necessities, but falls well short of providing for a modest standard of living, then that person or family is still considered to be living in poverty.

### **2.2. GDP (Gross Regional Domestic Product)**

Gross Domestic Product (GDP) is a measure of the total value added by all economic activity in a given area. (Currency unit of Indonesia). Gross Domestic Product (GDP) refers to the total worth of all economic activities in a specific territory, regardless of whether the production factors are owned by the people within that region or by individuals in other regions (Sukirno in Kairupan, 2015). The Gross Regional Domestic Product (GRDP), as defined by the Central Statistics Agency, represents the total value created by all businesses in a specific region. It encompasses the combined value of services and finished commodities produced by all economic entities within that territory. Gross Regional Domestic Product (GDP) based on prevailing prices represents the total value of goods and services, calculated using the prices of each year. On the other hand, Gross Regional Domestic Product (GDP) based on constant prices represents the total value of goods and services, calculated using the prices of a specific

year. The Gross Regional Domestic Product (GDP) is calculated using constant prices to measure the annual economic growth (Sukirno in Supriyanto and Arif, 2017).

### **2.3. Processing Industry**

There is also the definition of industry according to experts, namely according to George T. Renner (2004), Industry is all human activities in the economic field that are productive / produce goods and money. According to I Made Sandi (2002), industry is an effort to produce finished goods with raw materials or raw materials through a large number of cultivation production processes so that these goods can be obtained at the lowest possible price but with the highest quality.

### **2.4. Investment**

In economic theory, investment is defined as the act of spending on the acquisition of capital goods and production equipment. The primary objective of this expenditure is to replace existing capital goods and, more importantly, to expand the stock of capital goods that will be utilized for the creation of products and services in the future. Investment refers to the allocation of resources towards activities aimed at enhancing the productive potential of the economy (Sukirno, 2009). Based on Sukirno's (2000) study, community investment endeavors will consistently stimulate economic activities and job prospects, enhance national income, and elevate the level of community well-being.

### **2.5. Population**

According to Malthus' hypothesis, as explained in Todaro and Smith (2004), high population expansion in a country leads to long-term poverty. Malthus argues that this is due to a general pattern where the population of a country grows exponentially. Sukirno (2006: 100) states that Nelson and Leibstein argue that there is a clear correlation between population growth and the level of community welfare. Furthermore, Nielsen and Leibstein argue that the swift expansion of population in developing nations does not result in a substantial improvement in the well-being of individuals. Instead, over time, welfare levels will decrease and the number of impoverished individuals will rise. High population density poses a significant hindrance to the economic progress of developing nations.

### **2.6. Unemployment**

According to Todaro (2003), there is a strong correlation between unemployment and its impact on poverty levels. Low living standards are characterized by both a lack of quality and quantity. This is seen in meager income levels, insufficient housing, subpar health conditions, limited education, high rates of newborn mortality, and relatively short life expectancy. Unemployment refers to the state of being without a job in the labor force. Open unemployment refers to the voluntary or purposeful choice of being unemployed in order to seek a better job. Unemployment refers to the state of being without a job despite actively seeking employment. In the field of population research, namely demography, individuals who are actively seeking employment are classified as belonging to a population subgroup known as the labor force. The labor force consists of individuals between the ages of 15 and 64, although not all individuals within this age range are included in the labor force (Zurisdah, Z 2016).

### **2.7. Export**

Todaro (2004) defines exports as trade operations conducted on an international level that have the potential to boost domestic demand, resulting in significant growth in manufacturing, as well as the establishment of a stable political structure and a flexible social system. Exports

are a reflection of international trade, providing emerging countries with the chance to attain economic advancement on par with more developed nations. Exports refer to a wide range of commodities and services that are produced within a country and then sold to other countries (Mankiw, 2006).

### 3. RESEARCH METHODS

#### 3.1. Analysis Model

This research method is a form of quantitative research that focuses on identifying associations or relationships between variables. Associative/quantitative research is a type of research that seeks to establish the relationship and the manner or form of impact between two or more variables. In this type of research, a theory is developed to explain, predict, and control symptoms. In order to facilitate quantitative analysis, a method of simultaneous analysis is employed, allowing the model to elucidate the immediate impacts of each variable (Russia, 2016).

The study will utilize quantitative data derived from secondary sources, specifically a time series acquired from the Central Statistics Agency or BPS. The data collection method employed in this study involves doing documentation studies, namely gathering and analyzing data from existing information pertaining to the subject under investigation. The research approach employed in this study utilizes the simultaneous data analysis technique, which is processed using the Evievs 7 application. The study was conducted in North Sumatra Province from 2009 to 2023.

#### 3.2. Operational Definition

This study uses seven variables that will be used as data in the process of applying the model. The seven variables are as follows:

It	Variable	Description	Measurement	Scale
1	Industrial GDP	Industry Growth on a Constant Price Basis (ADHK)	Billion Rupiah	Ratio
2	Poverty	Number of Poor People in North Sumatra Province	Thousand Souls	Ratio
3	Number of Industries	Number of Processing Industries in North Sumatra	Thousand Units	Ratio
4	Investment	Total Investment (PMDN) in the industrial sector in North Sumatra	Million Rupiah	Ratio
5	Population	Number of Population in North Sumatra Province	Million	Ratio
6	Unemployment	People in the labor force who have not found a job or are looking for work	Thousand Souls	Ratio
7	Export	International Trade Activities Abroad by Industry Sector	Million Rupiah	Ratio

Output results are tested using several methods including:

1. Classical assumption test

a. Normality test

To find out whether the disturbing factors are normal or not  $\mu$  was carried out with the Jarque-Bera Test (J-B Test).

b. Autocorrelation test

The Autocorrelation Test is intended to find out whether there is a correlation between residual (members) in a certain series of observations in a certain period.

c. Conformance test

We use the tools provided by the Eviews statistics program to estimate the model. The regression output displays the resulting coefficient, which is derived from the data that is analyzed and understood. This allows one to ascertain the strength of the independent variable, understand the dependent variable, and comprehend the significance of each variable that is investigated.

4. RESEARCH RESULTS AND DISCUSSIONS

4.1. Results

This variable aims to determine the influence of the number of industries, investment, exports, and poverty on the GDP of the processing industry and also to determine the number of population, unemployment and industrial GDP on poverty.

1. Normality Test

System Residual Normality Tests  
 Orthogonalization: Cholesky (Lutkepohl)  
 Null Hypothesis: residuals are multivariate normal  
 Date: 07/19/24 Time: 09:35  
 Sample: 2009 2023  
 Included observations: 15

Component	Jarque-Bera	Df	Prob.
1	3.125170	2	<b>0.2096</b>
2	1.488422	2	<b>0.4751</b>
Joint	4.613592	4	0.3293

In this study, to test the normality of the data, the *Jarque-Bera Test* was used. The criterion used is that if the probability value of the *Jarque-Bera* test (JB) > alpha 0.05, the data will be said to be normal. In the table, it is known that the probability value of equation 1 and equation 2 > 0.05 so that the assumption of normality is said to be fulfilled.

2. Autocorrelation test

System Residual Portmanteau Tests for Autocorrelations  
 Null Hypothesis: no residual autocorrelations up to lag h  
 Date: 07/18/24 Time: 20:47  
 Sample: 2009 2023  
 Included observations: 15

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	Df
1	3.092185	0.5425	3.313056	0.5069	4
2	4.649423	0.7943	5.109868	0.7458	8
3	9.920874	0.6229	11.69918	0.4701	12
4	12.06955	0.7392	14.62920	0.5519	16
5	17.33841	0.6309	22.53249	0.3123	20

6	18.73769	0.7658	24.86463	0.4131	24
7	20.07887	0.8616	27.37933	0.4977	28
8	23.44406	0.8638	34.59044	0.3452	32
9	24.17173	0.9337	36.40964	0.4496	36
10	24.95942	0.9698	38.77269	0.5254	40
11	26.14391	0.9851	43.21452	0.5052	44
12	27.22597	0.9932	48.62482	0.4477	48

Based on the results of *df is degrees of freedom for (approximate) chi-square distribution* above, it can be seen that all indicators of lag movement over time show an autocorrelation effect in moving data, where the prob value of Q-stat entirely exceeds 0.05 or 0.10 so that it is proven that nothing in the data has an autocorrelation effect.

### 3. Conformance test

System: SIMULTANEOUS  
 Estimation Method: Two-Stage Least Squares  
 Date: 07/18/24 Time: 18:31  
 Sample: 2009 2023  
 Included observations: 15  
 Total system (balanced) observations 30

	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	11.35797	4.796235	2.368101	0.0276
C(11)	0.174165	0.029520	5.899841	0.0000
C(12)	0.009257	0.014712	0.629232	0.5360
C(13)	0.076457	0.097272	0.786013	0.4406
C(14)	-0.489213	0.479764	-1.019697	0.3195
C(20)	29.40102	8.575174	3.428621	0.0025
C(21)	-1.469515	0.673349	-2.182398	0.0406
C(22)	-0.008093	0.020711	-0.390746	0.6999
C(23)	0.186661	0.223962	0.833449	0.4140
Determinant residual covariance		2.72E-06		

Equation: LOG(PDRB)=C(10)+C(11)\*LOG(JIN)+C(12)\*LOG(INV)+C(13)  
 \*LOG(EKS)+C(14)\*LOG(KMK)

Instruments: C JIN INV EKS JP PNG

Observations: 15

R-squared	0.916611	Mean dependent var	11.35715
Adjusted R-squared	0.883256	S.D. dependent var	0.170305
S.E. of regression	0.058190	Sum squared resid	0.033860
Durbin-Watson stat	2.270814		

Equation: LOG(KMK)=C(20)+C(21)\*LOG(JP)+C(22)\*LOG(PNG)+C(23)  
 \*LOG(GDP)

Instruments: C JIN INV EKS JP PNG

Observations: 15

R-squared	0.634132	Mean dependent var	7.226477
Adjusted R-squared	0.534350	S.D. dependent var	0.060670
S.E. of regression	0.041400	Sum squared resid	0.018854
Durbin-Watson stat	1.506938		

**a. Equation 1 PDRB JIN INV EX KMK**

We can infer that the variables JIN (Number of industries), INV (Investment), EKS (Exports), and KMK (Poverty) account for 91.66% of the variation in GDP (Gross Regional Domestic Product) from the estimates in equation 1 ( $R^2 = 0.916611$ ), while other variables account for 8.34% of the variation.

According to the results of the t-calculation, there is one variable, JIN (Number of industries), that has a significant impact on GDP (Gross Regional Domestic Product) at  $\alpha = 0.05$  or  $\alpha = 5\%$ , with a probability value of  $0.0000 < 0.05$ , thus JIN (Number of industries) has a significant effect on GDP. The following variables do not significantly impact GDP (Gross Regional Domestic Product): INV (Investment), EKS (Export), and KMK (Poverty). This is due to the fact that the probability values of these three variables are higher than  $\alpha = 0.05$  or  $\alpha = 5\%$ .

**b. Equation 2 KMK JP PNG PDRB**

Equation 2's estimation results reveal a  $R^2$  value of 0.634132, which indicates that the economic variables JP (Number of Population), PNG (Unemployment), and GDP (Gross Domestic Product) account for 63.41% of the variation in KMK (Poverty), while other variables account for the remaining 36.59%.

According to the t-calculation value's estimation results, JP (Number of Population) is a significant variable that impacts KMK (Poverty). This is due to the fact that JP (Number of Population) has a probability value of  $0.0406 < 0.05$ , indicating that it significantly affects KMK (Poverty). Other factors that could be considered are PNG (Unemployment) and GDP (Gross Regional Domestic Product), both of which have probability values greater than 0.05 or 5%. Consequently, these variables do not significantly impact KMK (Poverty).

## **4.2. Discussion**

### **1. The Influence of the Number of Industries on Industrial GDP**

The variable of the number of industries has a positive and significant influence on GDP, this is in line with the results of the study (Foengsitanjoyo trisantoso julianto, Suparno, 2016) the variable of the number of industries in this study has a significant effect on the GDP in the city of Surabaya. This can be due to the fact that the more industries that develop, the more positive the impact on the Industrial GDP.

### **2. The Effect of Investment on Industrial GDP**

Investment variables have a positive but not significant influence on GDP, this is in line with the results of the study (Nur Anisa, 2023) the investment variables in this study do not have a significant effect on GDP in West Java province. This can be due to complex regulations and slow bureaucracy that can hinder investment in industrial growth.

### **3. The Influence of Exports on Industrial GDP**

The Export variable has a positive but not significant influence on GDP, this is in line with the results of the study (Nur Anisa, 2023) the export variable in this study does not have a significant effect on GDP in West Java province. This is because the products produced are still unable to compete in the international market.

### **4. The Effect of Poverty on Industrial GDP**

The Poverty variable has a negative and insignificant influence on GDP, this is not in line with the results of the study (Arius Jonaidi, 2012) the poverty variable in this study has a significant effect on GDP. This is because poverty is not one of the variables that plays a role in the Industrial GDP.

#### **5. The Effect of Population on Poverty**

The Population Variable has a negative and significant influence on Industrial GDP, this is in line with the results of the study (Vikky Lukmawan, 2020) the Population Variable in this study has a negative and significant effect on Poverty in Central Java province. This is due to the increase in the number of quality population, which will reduce the poverty rate.

#### **6. The Effect of Unemployment on Poverty**

The Unemployment Variable has a negative and insignificant effect on Poverty, This is in line with the results of the study (Fivien Muslihatin Ningsih, Jainal Abidin, 2020) the unemployment rate variable in this study has a negative and insignificant effect on the poverty rate in East Java Province. This is because if a community has a job, then the community will be able to meet its needs, but if there are still people in the community who are not working or unemployed, it will automatically reduce the welfare of a community which will automatically also affect the poverty level.

#### **7. Industrial GDP to Poverty**

The Industrial GDP variable has a positive but not significant influence on poverty, this is not in line with the results of the study (Arius Jonaidi, 2012) the poverty variable in this study has a positive but not significant effect on poverty. Increasing GDP is actually necessary and an option, but it is not enough to overcome the problem of poverty. The problem is not only how to increase GDP growth, but what needs to be considered is how to distribute and distribute it, so that the results of the growth itself can be felt by all levels of society.

### **5. CONCLUSION**

Based on the results of the analysis and discussion that has been carried out, the following conclusions can be drawn:

1. Based on the results of the research in the first equation, it can be seen that only the Number of Industries variable has a positive and significant influence on Industrial GDP, because the more industries that contribute, of course, have a positive impact on Industrial GDP in the future. Therefore, the number of industries has an influence on the industrial GDP in the province of North Sumatra.
2. Based on the results of the research in equation two, it is known that the Population Variable has a positive and significant effect on Poverty. Meanwhile, the variables of unemployment and industrial GDP do not have a significant effect on poverty in North Sumatra.

### **SUGGESTION**

Based on the results of the discussion and conclusion, the suggestions that the author needs to elaborate are as follows:



1. The number of industries in North Sumatra needs to be considered because the processing industry is the second largest contributor to GDP after the agricultural sector, so that it can have a positive impact in the future for the GDP of North Sumatra Province
2. Infrastructure problems need to be improved so that the distribution of raw materials or production products from industries located in remote locations can get good materials in order to produce products that can reach the international market and provide a larger number of exports in the future
3. Access to financiers such as investment needs to be considered, complex regulations and slow bureaucracy can hinder investment in industrial growth
4. More attention is needed to the increase in the population, because the increasing population can affect the poverty level of North Sumatra province.
5. For the next researcher, other exogenous variables that affect this researcher can be included, so that they can see the impact of the industrial sector on the poverty level in North Sumatra province.

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