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Analysis of the Influence of Economic Growth Income Inequality and Poverty Reduction in North Sumatra

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Abstract

This study aims to analyze the effect of economic growth and income inequality on poverty alleviation in North Sumatra, and determine whether the level of influence of economic growth is pro-poor or anti-poor. The method used is panel data analysis of 33 regencies/cities in North Sumatra in the 2016-2020 period, the results of the study show that economic growth and income inequality in North Sumatra have a negative effect on poverty. Meanwhile, seen from the net elasticity of poverty, income inequality becomes an obstacle or reduces the effectiveness of economic growth in alleviating poverty. Economic growth in North Sumatra during 2016-2020 is pro poverty (pro poor) of 0.338.

Keywords
economic growth; income inequality; poverty alleviation

I. Introduction

Development is a multidimensional process that involves major changes in social structures, familiar mental attitudes and national institutions, including the acceleration or acceleration of economic growth, income inequality, and eradication of absolute poverty (Dewanto et al., 2012).

The benchmark for the success of development can be seen from economic growth, economic structure, and the smaller income inequality between residents, between regions and between sectors. Economic growth is indeed not enough to eradicate poverty but usually economic growth is something that is very much needed, even a good economy will be meaningless for the poor if it is not accompanied by a sharp decline in distribution or equity.

In general, it is meant that economic growth is one indicator of the success of development. While the most important goal of development is poverty reduction which can be achieved through economic growth and through income redistribution (Kakwani and Son, 2003).

This is based on the trickle down effect theory which was first developed by Arhur Lewis (1954). The theory has become one of the important topics in the literature on economic development in developing countries (least Develop Countries/LDCs).(Soleh, 2015)

Issues of economic growth, income inequality and poverty have become the main focus of economic development at both global and national levels. The analysis of the triangular relationship between these three things has been the subject of a long and very interesting debate, especially in the selection of economic development strategies in poverty alleviation efforts.

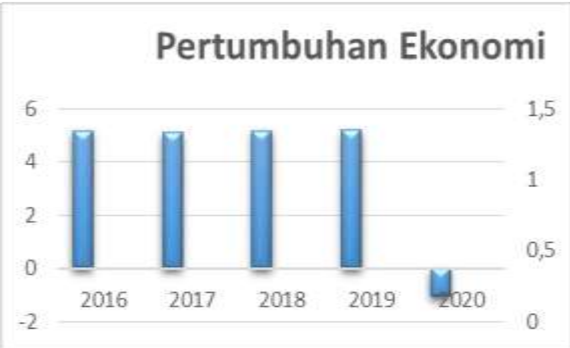
First, whether to prioritize high economic growth to the exclusion of the distribution of income. Second, whether to prioritize an even distribution of income without sacrificing economic growth. On the other hand, the problem of poverty and income inequality will also hamper the rate of economic growth itself. (Wira Hendri; Taufan Iswandi, 2022)

Economic growth is still an important goal in a country's economy (Magdalena and Suhatman, 2020). Economic growth is one indicator of the success of development, while economic development is an effort to increase per capita income by processing potential economic power into a real economy through investment, increasing skills, increasing organizational and management capabilities (Sjafrizal, 2008).

Economic development is not always evenly distributed, income inequality between regions is a very serious problem, some regions experience fast economic growth, but some other regions experience slow growth. These have not experienced the same progress, this is due to the lack of available resources.(Arif & Wicaksani, 2017)

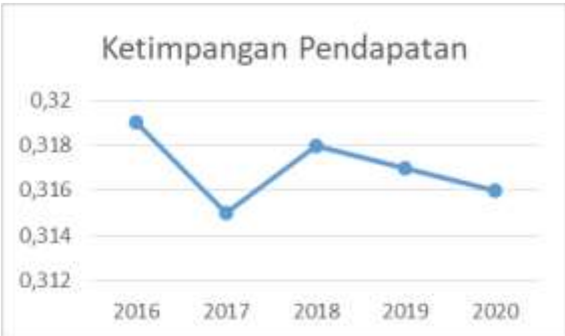
Theoretically and supported by many empirical studies, it is proven that high economic growth has an impact on income inequality. Income inequality is related to the distribution of income received by the people of a country. The higher income inequality means that the distribution of income in the community is increasingly unequal. This condition will eventually enlarge the gap between people with a relatively good economic level (the rich group) and those with low incomes (the poor group).(Amri, 2017)

Economic growth in an area can be measured by looking at the GDP and its growth rate at constant prices. Economic growth in North Sumatra tends to fluctuate. North Sumatra's average economic growth is around 5.18, while in 2020 there was a significant decline of around -1.07 economic growth due to the pandemic and the North Sumatra economic growth table.



Source: BPS North Sumatra Province.

The Gini index data for 2016-2020 in Figure 3 shows that in general the province of North Sumatra fluctuates. In 2016 there was a very large inequality while in 2017 the inequality decreased and in 2018 it increased and in 2019 to 2020 the index data decreased.



Source: BPS North Sumatra Province

The percentage of poor people in North Sumatra Province has decreased, from around 10.35 percent in 2016 to 8.75 in 2020.

II. Review of Literature

2.1 Economic Growth

The definition of economic growth is economic development that persists from time to time and causes real regional income to grow. Economic growth is mostly measured by the increase in regional income for a certain period.(Pangiuk, 2018)

The definition of economic growth according to Shumpeter in Putong is an increase in output (national income) caused by a natural increase in the rate of population growth and the level of savings.(Novriansyah, 2018)

According to Arsyad (2010), economic growth is an increase in Gross Domestic Product (GDP) and Gross National Gross (GNP) regardless of whether the increase is greater or less than the population growth rate, and there is an improvement in the economic structure or institutional sister. Meanwhile, according to Simon Kuznet, economic growth is an increase in the long-term capacity of the country concerned to provide various increases in economic goods for the population. The increase in capacity itself is determined or possible by the progress or adaptations of technology, institutions, and ideology to the various demands of the existing conditions.(Andiny & Mandasari, 2017)

2.2 Income Inequality

Income inequality is a condition where the distribution of income received by the community is not evenly distributed. Inequality is determined by the level of development, ethnicity, inequality is also related to dictatorship and the government fails to respect property rights.(Glaeser, 2005)

Alesina and Rodrik (1994) in(Hajiji, 2010)states that income inequality will hinder growth. This is because inequality causes income redistribution policies which of course will be expensive. Tadoro and Smith (2006) stated that income inequality will cause several things, including:

1. Extreme income inequality will lead to economic inefficiency.
2. Extreme income inequality will undermine social stability and solidarity.
3. Extreme income inequality is generally considered unfair.

Several measures of inequality that are often used include the Gini Index, Theil Index, and the World Bank's measure of inequality. In this study using the Gini index.

2.3 Poverty

According to the SMERU Research Institute (2001), poverty is defined as the inability of a person to meet basic consumption needs and improve their quality of life. Poverty arises due to inequality in ownership of the means of production, poverty affects attitudes, culture of life, and a certain environment in a society.(Novriansyah, 2018) while the definition of poverty itself is a problem that involves many aspects because it is related to low income, illiteracy, low health status and inequality between sexes and the bad environment.(World Bank Group, 2006)

According to the World Bank, one cause of poverty is the lack of income and assets to meet basic needs such as food, clothing, housing and an acceptable level of Health and Education. In addition, poverty affects the lack of job opportunities and usually they are categorized as poor without work (unemployment) and their education and health levels are generally inadequate.(Romi et al., 2018)

2.4 Pro poor Growth Index (PPGI)

Kakwani and Pernia (2000) stated that the concept of pro poor growth was first introduced in the 1950s and was further emphasized by Chenery (1974). The concept of pro poor growth is also implicitly explained in the Development Report 1990 (Word Bank, 1990).

Pro poor growth index is a measure to see the extent to which economic growth can be called pro poor. This index has several advantages, including:

1. The data required is not always difficult, so it is easy to calculate
2. This index can be used to formulate pro-poor policies at the macro and micro levels
3. This index can be calculated by economic sector or region

III. Research Method

This study wants to see the relationship in which several variables are focused on, namely economic growth, income inequality and poverty, where each variable has a relationship. The scope of this research analysis is North Sumatra in the 2016-2020 district/city period.

The data used in this study is secondary data originating from BPS North Sumatra. The data used include the population, GRDP of the districts/cities of North Sumatra, the results of the National Socio-Economic Survey (SUSENAS), the Gini Index, and the poverty rate, as well as several other macro-social data.

The method used in this research is descriptive analysis, to describe the effect of economic growth and income inequality on poverty alleviation; and Panel Data Regression Analysis, to see the direction and magnitude of the influence of economic growth and income inequality on poverty alleviation, and the last is the Pro poor growth index (PPGI), to see whether the level of influence of economic growth in the North Sumatra Region is pro-poor or anti-poor.

Data Analysis Model

1. The effect of economic growth on income inequality is calculated using the model developed by Wodon (1999) as follows:

   Log log $G_{it} = \alpha_i + \beta_i \log Y_{it} + \varepsilon_{it}$ ……..

   Where:

   G : Gini index (values are 0 and 1)

   Y : constant GRDP (in units of RP million)

   α : intercept (fixed/random effect for district i)

   ε : error term

   i : district 1,2,3,..11

   t : 2016-2020

2. The effect of economic growth and income inequality on poverty is calculated using the model developed by Wodon (1999) as follows:

   Log $P_{it} = \omega_i + \gamma_i \log Y_{it} + \delta \log G_{it} + v_{it}$

   Where:

   P : meet the poor (in soul units)

   Y : constant GRDP (in units of IDR million)

   G : Gini index (value between 0 and 1)

ω : intercept (fixed/random effect for district i)
ε : error term
i : district 1,2,3,… 11
t : 2016 to 2010

3. The effect of economic growth on poverty is calculated using the model developed by Wodon (1999) as follows:
   $\lambda = \gamma + (\beta \times \delta)$
   The parameter represents the elasticity of poverty to economic growth when the income distribution does not change. The parameter represents the elasticity of poverty to income inequality. Then the parameter can be calculated, namely the net elasticity of poverty to economic growth (net elasticity of growth).$\gamma\delta\lambda$

4. *Pro poor Growth index.*The measure of poverty is a measure determined by the poverty line, average income and the Lorenz curve which expresses income inequality (Kakwani and Pernia, 2000), so that
   $\theta = \theta$ (z, μ, L (p))
   Where:
   θ = measure of poverty (percentage of number of poor people in percent)
   z : poverty line (in units of IDR per year)
   μ : the average income of the community (in units of RP per year)
   $L(p)$: Lorenz curve, showing the percentage share of income enjoyed by group p the lowest percent of the population (values between 0 to 1).

IV. Results and Discussion

4.1 Results

a. The Effect of Economic Growth on Income Inequality

The effect of economic growth on income inequality is calculated using the model developed by Wodon (1999) as follows:

$$\log G_{it} = \alpha_i + \beta_i \log Y_{it} + \varepsilon_{it} \text{ …….. (1)}$$

The effect of economic growth on income inequality can be seen from the elasticity of income inequality on economic growth. The model used is a double log model, so that the parameters β that can symbolize the elasticity of income inequality on economic growth. The value β is positive or negative. If the value β is positive, it means that a constant 1 percent increase in GRDP will increase income inequality by 1 β percent. If the value β is negative, it means that a constant 1 percent increase in GDP will reduce income inequality by 1 β percent.

Model 1 was regressed using the Random Effect model using weighting cross section weights and white heteroscedascity. The model with fixed effects was chosen after going through a test which concluded that the model with individual effects was better than the common effect (F test).

Table 1. The effect of economic growth on income inequality.

Variabel	coeficient	Std Eror	t-statistic	Prob
C	3.350922	0.627332	5.341546	0.0000
X1	0.036338	0.036634	0.993062	0.3222

R-square	0.006106
Adjusted R-squared	-0.000145
S.E of regression	0.989415
F-statistic	0.976758
Prob (F-statictic)	0.324502

*Significant at 5% significance level
*Significant at the 10% level of significance

From the table above, the equations obtained are:

$$\text{Log } G_{it} = 3.350922 + 0.0363380 + \varepsilon$$

The results of data processing show that the value β obtained is 0.0363380, meaning that an increase in GDP of 1 percent will increase income inequality by 0.166 percent. The results are in line with the theory expressed by Kuznez (1995) which results in a relationship between economic growth and income inequality. Which is then known as the inverted U-curve Hypothesis.
*Significant at 1% level of significance

b. The Effect of Economic Growth and Income Inequality on Poverty

The effect of economic growth and income inequality on poverty is calculated using the model developed by Wodon (1999) as follows:

$$\text{Log } P_{it} = \omega_i + \gamma_i \log Y_{it} + \delta \log G_{it} + v_{it} \text{ …..(2)}$$

The model used is a double log model, so the parameter γ obtained represents the gross elasticity of poverty to economic growth (gross elasticity of poverty to growth). While δ that can symbolize the elasticity of poverty in gross income inequality (gross elasticity of poverty to inequality). If γ and δ is positive, it means that an increase in the constant GRDP and the gono index by 1 percent will increase poverty by γ and δ.

Table 2. The effect of economic growth and income inequality on poverty

Variabel	coeficient	Std Eror	t-statistic	Prob
C	2.372167	1.166896	2.03288	0.0437
X1	0.066700	0.036718	1816547	0.0712
X2	-1.132409	3.816075	-0.29674	0.7670

R-squared	0.020300
Adjusted R-suared	0.007899
S.E of regression	0.974457
F-statistic	1.636917
Prob (F-statistic)	0.197861

*Significant at 1% level of significance
*Not significant

Based on the table, the equations obtained are:

$$\text{Log P poor} = 2.372167 + 0.066700\ \text{PDRB} - 1.132409\ \text{Gini} + \varepsilon$$

The processing results show that economic growth will reduce poverty with an elasticity value of 0.066. This growth will increase per capita income, increasing per capita income means that the poor will decrease. On the other hand, income inequality data shows that income inequality is negatively related to poverty with an elasticity value of -1.132, meaning that every 1% decrease in inequality in poverty will increase by 1.132%.

c. The Effect of Economic Growth on Poverty

The effect of economic growth on poverty is calculated using the model developed by Wodon (1999) as follows:

$$\lambda = \gamma + (\beta \times \delta) \ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(3)}$$

The parameter γ represents the elasticity of poverty to economic growth when the income distribution does not change. The parameter δ represents the elasticity of poverty to income inequality. Then the parameter λ can be calculated, namely the net elasticity of poverty to economic growth (net elasticity of poverty to growth).

The effect of economic growth and income inequality together on poverty is determined by the net elasticity of poverty on economic growth (λ). This value is obtained by taking into account the direct and indirect effects of economic growth variables on poverty.

Table 3. Decomposition of the effect of net economic growth on poverty

Effect Growth Economy (γ)	Effect Inequality income ($\beta \times \delta$)	Elasticity net Poverty to Growth Economy (λ)
0.066700	-0.0441149	0.0225851

Based on the data in the table, the net elasticity of poverty on economic growth (λ) is 0.0225851. poverty should decrease by 0.0667 percent if there is economic growth of 1 percent, but due to the effect of income inequality, poverty will increase by 0.0225 percent. This indicates that the effect of increasing income inequality that occurs not only reduces the effectiveness of the effect of economic growth, but also increases the poverty rate. The economic growth that occurred during this period reduced income inequality and actually increased poverty.

d. Pro Poor Growth Index

*Pro poor growth index (*PPGI) is calculated by the following formula (Kakwani and Pernia, 2000):

$$\phi = \frac{\lambda}{\gamma} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots$$

The calculation results in the table show that the λ value $\frac{0.0225851}{0.066700}$ = 0.338607196

Based on the criteria of Kakwani and Pernia (2000). The result ϕ of 0.338607296 indicates that economic growth in North Sumatra has been pro poor (*pro-poor growth).*So even though the economic growth achieved has an impact on increasing income, overall economic growth is able to reduce poverty.

4.2 Discussion

The results of the test in table 1 which discusses the effect of economic growth on income inequality. Where the results of data processing show that the value β obtained is 0.3222, meaning that an increase in GDP of 1 percent will increase income inequality by 0.3222 percent. This increase in income inequality is because the economic growth achieved is not enjoyed equally by all population groups, both urban and rural.

This result is in line with that obtained by Istiqamah *et al* (2018), inequality in economic growth causes income inequality to increase and the results are also the same from researcher Anto (2016) which states that economic growth will increase income inequality. This is different from the findings of Pendi*et al*(2014) economic growth reduces income inequality, the results are not according to Lin (2004) and Hidayat and Patuntru (2007) research which states that economic growth will increase income. In line with Kuznets (1995) which results in a relationship between economic growth and income inequality, which is known as the inverted U-curve hypothesis.*(inverted U-curve Hypothesis).*

Furthermore, from the estimation results in the second table which discusses the effect of economic growth and income inequality on poverty, the results show that economic growth will reduce poverty. This growth will increase per capita income, an increase in per capita income means that the poor will decrease. The opposite is true for inequality. Table 2 shows that an increase in income inequality is negatively related to poverty.

The results from table 3 which discusses the decomposition of the effect of net economic growth on poverty based on table 3, the net elasticity of poverty on economic growth, economic growth and income inequality will collectively reduce poverty. This is in line with the conclusions of research by Bidani and Ravallion (1993), Lin (2003), Bourguignon (2004), Ravallion (2006), and Warr (2000, 2006).λ

Poverty alleviation can be done by making changes to the distribution of income or by increasing income (Bourguignon, 2004; Warr, 2006). However, the conditions that occur in North Sumatra Province are an increase in income and an increase in inequality. So that the effectiveness of economic growth in reducing poverty will be reduced.

In the analysis of the Pro Poor Growt Index, the calculation results in table 3 show that the criteria of Kakwani and Pernia (2000) indicate that economic growth in North Sumatra Province has*pro poor (pro poor growth).*Although the economic growth achieved has an impact on increasing income, overall this economic growth reduces poverty.

V. Conclusion

Based on the discussion presented, it can be concluded that the effect of economic growth on income inequality, growth succeeded in reducing poverty in North Sumatra Province, but economic growth in North Sumatra Province turned out to also increase income inequality as an obstacle or reduce the effectiveness of economic growth in poverty alleviation. Economic growth in North Sumatra is not*pro*poverty (*anti poor*).

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