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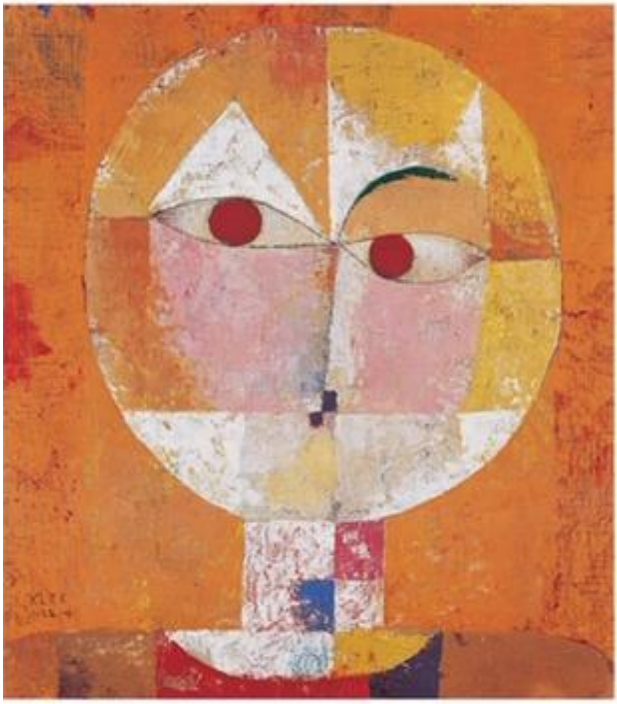

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Economic growth and poverty in Sumatra

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Abstract

This study aimed to analyze the effect of economic growth on poverty and income inequality in the region of Sumatra by using the ARDL panel model. The data used is the panel data from 2008 to 2017 and 120 districts/cities of 7 provinces in Sumatra with a total of 1200 samples. The results showed that in the short term on the GDP variables and GR no effect on poverty, but there is short-term relevance to the long-term. In conclusion, overall findings indicate that in the short term and long term, economic growth and income inequality affect poverty in Indonesia.

Keywords: Economic growth, income inequality, poverty.

Crecimiento económico y pobreza en Sumatra

Resumen

Este estudio tuvo como objetivo analizar el efecto del crecimiento económico sobre la pobreza y la desigualdad de ingresos en la región de Sumatra utilizando el modelo de panel ARDL. Los datos utilizados son los datos del panel de 2008 a 2017 y 120 distritos / ciudades de 7 provincias en Sumatra con un total de 1200 muestras. Los resultados mostraron que, a corto plazo, las variables del PIB y el GR no tienen efecto sobre la pobreza, pero

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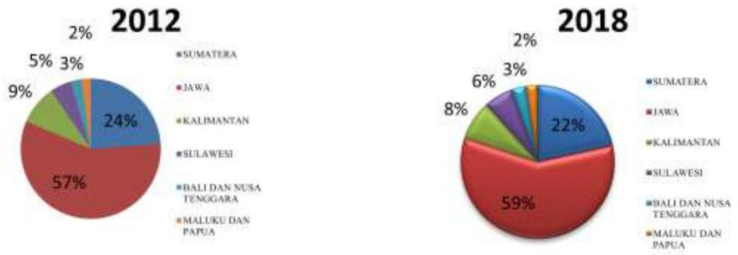
hay relevancia a corto plazo para el largo plazo. En conclusión, los resultados generales indican que a corto y largo plazo, el crecimiento económico y la desigualdad de ingresos afectan la pobreza en Indonesia.

Palabras clave: crecimiento económico, desigualdad de ingresos, pobreza.

1. INTRODUCTION

Economic growth, inequality, and poverty become an essential topic in the literature and development thought of the developing countries. The main objective of development is to overcome poverty through economic growth and income redistribution. Analysis of the relationship between these three things has become an attractive discussion material particularly, particularly in the selection of the poverty reduction strategy. Some previous research studies reveal different results depending on the country and performed during the research. Indonesia is one of Southeast Asia country that has a high economic potential; economic growth in Indonesia was ranked as the third among member countries of the G-20. However, according to the Central Statistics Agency (BPS), Indonesia's economy is still facing gaps between regions. Indonesian economic structure during the years 2012 & 2018 can be seen in Figure 1.



Picture 1. GDP by the island in Indonesia 2012-2018 (percent)
Source: BPS Indonesia, 2019

The Indonesian economic growth during the years 2012 & 2018 is still in Java reaches 57.51 percent in 2012 and 58.48 percent in 2018, followed next by Sumatra island at 23.91 percent in 2012 and 21:58 percent in 2018. Meanwhile, four other islands, namely the Kalimantan, Sulawesi, Bali and Nusa Tenggara, Maluku and Papua Island and its economic growth rate is still below 10 percent.

Sumatra region is part of Indonesia which consists of 10 provinces. Sumatra region is the second-highest population after Java Island, with residential 21.15 from the total population of Indonesia. `With a high population, they cannot be separated from the problem of economic inequality. It is triggered by differences characteristic between provinces that have a strong influence on the creation of the pattern of economic development in each region. Some areas in Sumatera can proliferate while another region grows slowly. Inequality will generate the economic growth rate was lower. With economic

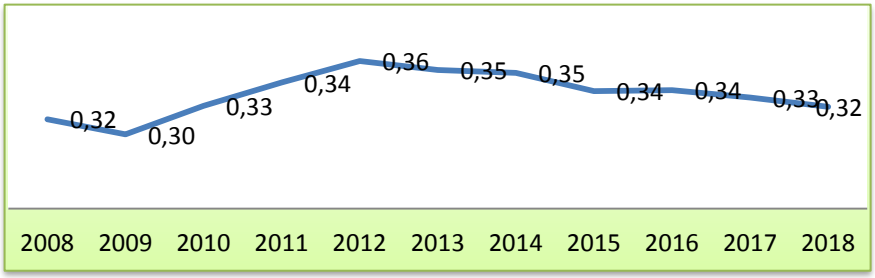
growth of more than 20 percent, the Sumatran is the second largest contributor of Gross Domestic Product after the Java Island.

High economic growth will increase the capacity of the economy (Gross Domestic Product). With a high GDP, it is expected a trickledown effect that increased public welfare, in trickledown effect theory benefits of economic growth will hatch down to the poor to create jobs and economic opportunities. According to trickledown theory, the effect of economic growth on poverty are indirect effects as the benefits of economic growth will be felt by the rich. After that, the poor after they have spent their income from the economic growth they receive. So that the effect of economic growth has not been able to improve the quality of life of low-income communities, the condition will lead to income inequality which causes poverty (BESMA, 2016).

Gini ratio is one of the distributions of incomes indicator. Gini value ratios ranged from 0 to 1. 0 value indicates that income is distributed equal (perfect equality), while a value of 1 indicates income is distributed equally (perfect inequality). Residential income inequality is low when the Gini coefficient is below 0.3. Residential income inequality is at the average stage when the Gini coefficient is in the range of 0.3 to 0.5. Residential income inequality is at high or very unequal stages when the Gini coefficient is above 0.5.

Based on picture 2, according to the Central Bureau of Statistics, the Indonesia Gini ratio value in every province in Sumatera is fluctuating or unstable during the years 2008-2018. In 2012 became

the year with the highest inequality in the region of Sumatra. Increasingly, however, the decreased were during the years 2013-2018, which means that there is an improvement in income distribution. Nevertheless, the values of the Gini ratio in Sumatra is still in moderate conditions and remain vulnerable to poverty.



Picture 2. Gini Ratio Sumatra Region 2008-2018
Source: BPS Indonesia, 2019 (processed)

On the other hand, the emergence of poverty and income inequality will hamper the economic growth rate in high-income countries inequality and harms growth. Inequality impact and poverty have the potency to cause social conflicts. Rebellion and other economic problems that can bring huge losses that would threaten the integrity of a country. Besides high inequality will lead to lower economic growth; therefore, FOSU (2017) stated the need for effective policies to reduce disparities in income distribution. To improve the welfare of the poor always to overcome poverty the government must

be able to create systems that will trigger growth and policies to reduce inequality (BAYEH & BALTOS, 2019).

AGRAWAL (2008) suggests that the level of poverty in Indonesia has decreased in line with improving economic conditions marked by the average economic growth of over 5 percent per year. The analysis finds that the variable HDI and Gini index effect on poverty. Many studies have been conducted on economic growth, inequality, and poverty but no one has analyzed the panel districts/cities in Sumatra, so there is a portrait of how the level of comparisons of economic growth, inequality, and poverty in regions in Sumatra. With this consideration, then this study is critical and exciting to do because it can show you areas that may not have been included in the previous studies (AJALLI & MOZAFFARI2018).

2. METHODOLOGY

The data used in this research is the secondary data in the form of panels from 2008 until 2017 and covers 120 districts/cities. The total sample in this study is 1200 samples. This study uses a model Autoregressive Distributed Lag (ARDL) Panel. The use of ARDL models with the assumption that the variables used in this study are dynamic, so the ARDL models fit in this study. Model ARDL panel is stated:

$$\Delta \ln P_{j,t} = \alpha_{0i} + \sum_{i=1}^{n} \alpha_{1i} \Delta \ln P_{i,t-1} + \sum_{i=1}^{n} \alpha_{2i} \Delta \ln PDRB_{i,t-1} + \sum_{i=1}^{n} \alpha_{3i} \Delta \ln GR_{i,t-1} + \beta_{11} \ln P_{j,t-1} + \beta_{21} \ln PDRB_{j,t-1} + \beta_{31} \ln GR_{j,t-1} + u_{j,t} \quad (1)$$

where P is the number of poor people, the GDP is economic growth, GR is the Gini Index, up to a short-term coefficient is up to is a long-term coefficient, t is the year ie, 2008-2017, j is the 120 districts/cities in Sumatera, i is the lag order, and u is the error term.$\alpha_1 \alpha_2 \beta_1 \beta_2$

3. RESULTS

The stationary test is a mandatory requirement before the ARDLestimation panel model is done. The stationary test results in Table 1. Stationarity testing in this study is using the four approaches LLC, IPS, ADF, and PP-Fisher Fisher with individual intercept and individual intercept and trend. Results Table 1 illustrates that each variable contained a different level, the level stationarity (I (0)) as well as the level of the first difference (I (1)). Because there is difference stationarity, then the ARDL models are qualified to be used in this study.

Table 1: Panel Unit Root

	LLC	**IPS**	**ADF-Fisher**	**PP-Fisher**
Individual Intercept				
Poverty	-85.715 (0.000)	-19.235 (0,000)	541.873 (0,000)	813.737 (0,000)
ΔPoverty	-57.919 (0,000)	-14.769 (0,000)	630.657 (0,000)	951.019 (0,000)
PDRB	13.651 (1,000)	9.015 (1,000)	88.458 (1,000)	78.446 (1,000)
ΔPDRB	-40.984 (0,000)	-18.703 (0,000)	797.115 (0,000)	1128.16 (0,000)
Gini Ratio	-41.203 (0,000)	-10.090 (0,000)	453,719 (0,000)	490.953 (0,000)
ΔGini Ratio	-28.025 (0,000)	-8.478 (0,000)	484.116 (0,000)	828.874 (0,000)
Individual Intercept and Trend				
Poverty	-85.059 (0,000)	-7.909 (0,000)	507.723 (0,000)	576.083 (0,000)
ΔPoverty	-33,526 (0,000)	-2.919 (0,000)	413.226 (0,001	914.426 (0,000)
PDRB	-14.879 (0,000)	-2.040 (0,020)	346.348 (0,000)	602.915 (0,000)
ΔPDRB	-87.376 (0,000)	-14.468 (0,000)	940.751 (0,000)	1102.98 (0,000)
Gini Ratio	-35.996 (0,000)	-0.619 (0,267)	277.760 (0,047)	338.181 (0,000)
ΔGini Ratio	-37.318 (0,000)	-5.643 (0,000)	586.475 (0,000)	1048.48 (0,000)

Source: Data Processing, 2019

Panel Co-Integration Test

Co-integration tests in this study using the Panel Cointegration with Predoni and KAO Based is aim to see some co-integrated variables in different orders I (0) or I (1) (BADALYAN, HERZFELD & RAJCANIO, 2014). Co-integration panel test results between P, the GDP, and GR at 5 percent and 1 percent significant level, so that it can be concluded that the relationship of short term to the long term is between three variables.

Table 2: Cointegration Panel

Predoni Cointegration Test	Statistic	Weighted Statistic
Panel v-Statistic	-1.358 (0.912)	-8.315 (1.000)
Panel rho-Statistic	6.824 (1.000)	7.173 (1.000)
Panel PP-Statistic	-10.903 (0.000)	-18.294 (0.000)
Panel ADF-Statistic	-7.487 (0.000)	-7.665 (0.000)
Group rho-Statistic	10.997 (1.000)	
Group PP-Statistic	-23.636 (0.000)	
Group ADF-Statistic	-4.171 (0.000)	
KAO Cointegration Test	t-statistic	
ADF	-15.827 (0.000)	

Source: Data Processing, 2019

Test lag in research using the Akaike Information Criterion (AIC). The purpose of the study was to see the smallest value and explain optimal lag using AIC criteria, so it attained lag as much as

one lag. Therefore, the selection of the best lag is to look at the smallest AIC value so that the lag used in this study was 1.1.

4. DISCUSSION

By using the ARDL Panel, the estimation is given can see the effect of short-term and long-term in poverty. The influence of economic growth on poverty and income inequality can be seen in Table 3.

Table 3: ARDL Panel Regression Result

Estimate	Variable	Coefficient	t-Statistic	*
Long Term	PDRB	-9.40	-0.564864(0.5723)	
(Long Run)	GR	11.28293	10.65708 (0.0000)	
Short Term	C	20.15331	6.837392 (0.0000)	
(Short Run)	ΔPDRB	-0.000527	-1.010065(0.3128)	
	ΔGR	4.118758	1.060051(0.2895)	
	ECT(-1)	-0.479966	-12.54191(0.0140)	

Source: Data Processing, 2019 (processed)
Note: *) Significant Levels

The results of this regression ARDL panel are eligible for an error correction term coefficient is the negative and significant slope, because this model is suitable, and therefore can be used as a model

for the analysis of the influence of economic growth and inequality on poverty in Sumatra.

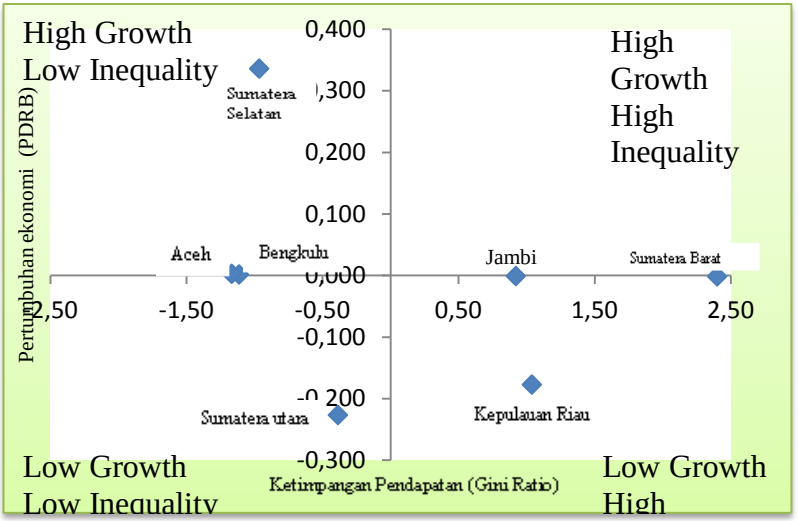
Economic growth does not significantly affect poverty either in the long term and short term. These findings coincide with research also supported by research (ABOSEDRA, SHAHBAZ & NAWAZ, 2015; HERNANDEZ, 2015). No significant economic growth on poverty could be caused by alow economic growth in Sumatra, causing imbalances and affect economic growth in overcoming poverty. Besides, the economic leakage due to the import is an issue of economic growth that does not change. Economic growth is an indicator to see the successful development and is a prerequisite for poverty reduction requirement that economic growth should be spread in every class of society, including the poor segments of society. HASSAN (2015) states that when economic growth is increased unemployment will also increase; the lack of employment will make people jobless will less income and causes poverty (ADEWARA & OLONI, 2013).

Furthermore, other variables that affect poverty are Gini ratio. The results of this study are similar to the research performed by AKHMAD & AMIR (2018) is also supported by research (DHRIFI, 2013). However, different results showed by (BAGCHI & SVEJNAR, 2012). From Gini ratio regression effect results on poverty can be inferred that the increasing inequality in Indonesia could lead to increased poverty. One of the things that drive inequality in Indonesia is the high concentration of wealth in which some people who have the

advantage through ownership of financial assets acquired from the improper way as corruption. Low economic resilience and natural disasters also affect poor households to earn and invest in health and education. Public policy is needed in favor of ordinary people so that high inequality can be avoided.

Analysis Typology Klassen describes the structure of regional economic growth. By using the GDP and Gini Ratio indicator, there are four classifications of growth in each region. Quadrant I showed rapid growth area (fast-growth region) who have low-income inequality and high economic growth. Quadrant II describes the developing regions (growing growth) who have income inequality and higher levels of high economic growth. Quadrant III depicts a depressed area (retarded region) who have low-income inequality and low economic growth rate. Quadrant IV describes the relatively disadvantaged areas (relatively backward region) that have a high-income inequality and economic growth rates. In this research, two stages of analysis, namely; (1) Klassen Typology According to the Province, and (2) Klassen Typology According COINTEQ01 the ultimate value of each province.

1. Economic growth typology linkages rates and inequality income level by province



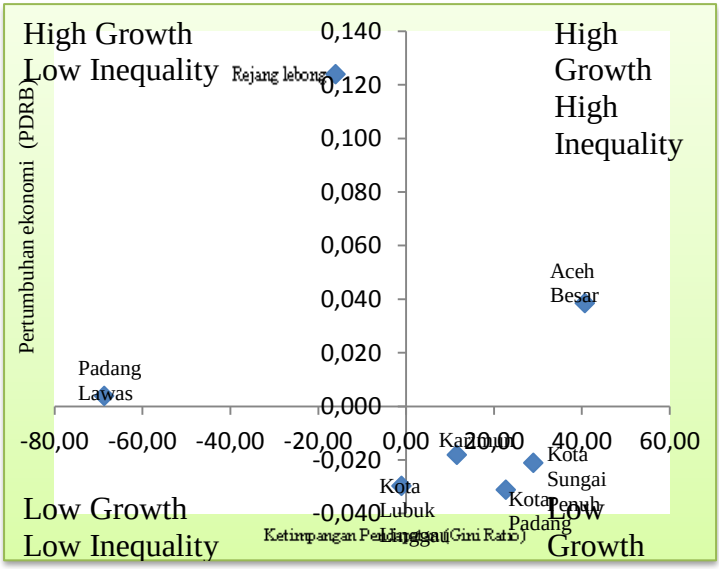
Picture 3: The comparison of economic growth conditions and income inequality by the province in Sumatera

Source: Data Processing, 2019

Based on the economic growth quadrant analysis and income inequality at seven provinces in the Sumatra area, it appears that the Province of South Sumatra, Aceh, and Bengkulu Provinces are at high growth levels with low inequality this condition is a portrait of three provinces; this is at developing and rapidly growing. The Province of Jambi and West Sumatra are at high growth rates with high levels of inequality. This suggests that economic growth in the province is only enjoyed by high-income groups, thus causing higher inequality. North Sumatra Province is categorized as advanced but still depressed by the conditions of low economic growth with low inequality. Meanwhile, the province of Riau Islands province with very poor conditions in

which the province is a backward province, BPS revealed that 40 of the 275 villages in the province are categorized backward.

2. Klassen Typology According Cointeq01 the ultimate value of each Province



Picture 4: The comparison of economic growth conditions and income inequality by cointeq01 value of each province in Sumatera
Source: Data Processing, 2019

Table 4 shows the dynamics of economic growth and income inequality at 7 districts/cities selected by looking at the highest cointeq01value of any province. It appears that the district/city that the

first quadrant there are two, namely, Rejang Lebong and Padang the area has a negative relationship pattern describes as developing and develop cities. District/city that goes quadrant II is only one, namely Aceh Besar, which means the patterned positive relationship. While district/town that included in quadrant III are four districts, namely Karimun, Sungai Penuh, Lubuk Linggau dan Padang. Meanwhile, none of the districts/cities that are included in quadrant IV. This shows that the position of the district/city in Sumatra area has characteristics majority spread in quadrant III, which showed that the low economic growth with high inequality. It will significantly affect poverty reduction in Sumatra as it high in income inequality will impede or reduce the effectiveness of economic growth on poverty reduction. Hence, the importance of the change is by overcoming poverty. One percent increase in the average income will reduce the proportion of people living under the poverty line (BLUHM, CROMBRUGGHE & SZIRMAI, 2018).

5. CONCLUSION

Overall findings indicate that in the short term and long term, economic growth and income inequality affect poverty in Indonesia. However, when it is compared to the effect in the short term and long term, the effect is greater in the long term rather than the short-term effect. Economic growth does not have a significant relationship with poverty. Inequality has a positive and significant relationship to

poverty in the long term. If further review it will be known that there are four categories in this study: namely, positive and significant, positive and not significant, and no significant adverse effect and a negative and significant effect.

Klassen typology analysis by the province has characteristics that the majority are spread in the first quadrant. Klassen typology analysis according to the highest cointeq01 value of each province majority spread in quadrant IV. Recommendations for the policymakers are to maintain economic growth to remain steady but equal and reducing income inequality to overcome poverty. The weakness of this study is the number of years is less compared to the number of districts or cities, because some areas in this study which is an expansion area, so that the data presented are not complete.

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