Determinants Of Income Inequality In 10 Provinces On The Island Of Sumatra For The Period 2017 – 2021

Neli Aida[1], Muhammad Kemal Abilio[2], Marselina[3]
(Neliaida422@gmail.com[1], Muhammad.kemal101619@students.unila.ac.id[2],
Marselina@feb.unila.ac.id[3])

University of Lampung, Indonesia, University of Lampung, Indonesia[2], University of Lampung, Indonesia[3]

Abstract. The problem of income disparity is one of the economic problems faced by Indonesia, especially the Sumatra region. Income disparity is a state of unequal distribution of income between groups of people with high incomes and groups of people with low incomes which creates a gap orgap gap followed by uneven economic development in each region. The problem of income disparity is seen from the point of view of the even distribution of income distribution for each community group, which in this study uses the Williamson index as a measure of income disparity, the gap in these differences at least does not have gap which is so far away that the economy of Sumatra in particular can develop as a whole.

This study used data from 10 provinces on the island of Sumatra for the period 2017 – 2021 to see the determinants of income disparity on the island of Sumatra. This study shows that 1) Gross regional domestic product has a negative and significant effect on income disparity figures for 10 provinces on Sumatra Island, 2) The open unemployment rate has a negative and significant effect on income disparity figures for 10 provinces on Sumatra Island, 3) Population density has a positive effect and significant to the income disparity figures of the 10 provinces on the island of Sumatra, 4) The number of poor people has no significant effect on the income disparity figures of the 10 provinces on the island of Sumatra.

Keywords : Income Inequality, GRDP, Open Unemployment Rate, Population Density, the Number of poor people.

1 Introduction

Economic growth is a crucial thing that is included in the success factor of an economic development. Aida [1] argue that Gross Domestic Product is an instrument for measuring economic success, so GDP is one of the things that must be considered. Empirical studies that discuss economic growth are often carried out to see how far the economy is able to bring an area to the expected standard of living. The state of the economy will become an object that will reflect the welfare of the population of a region, including the island of Sumatra, the

higher the economic growth rate on the island of Sumatra will result in the high welfare of the population on the island of Sumatra.

Sumatra Island is one of the largest islands in Indonesia. With an area of 443,065.8 km2 with the fastest economic growth in Java Island. The rapidly growing economic activity on the island of Sumatra is supported by extraordinary natural resources and a very profitable position. Sumatra Island is located in the western part of Indonesia which is bordered by the Sunda Strait, Malacca Strait and the Indian Ocean. Due to its excellent accessibility, this island is used as the main western entry point for Indonesia. Natural gas, coal, bauxite, tin, petroleum, tobacco and palm oil are some of the well-known potential areas of Sumatra Island which have become an attraction for domestic and international investors to this island.to [1] in her empirical study suggests that GRDP is a parameter to see the degree of prosperity of the people in a region. So in other words, economic success which involves the prosperity of the people in a region in terms of GRDP cannot be separated. For this reason, the image below presents the average GRDP on the island of Sumatra for the period 2017 – 2021.
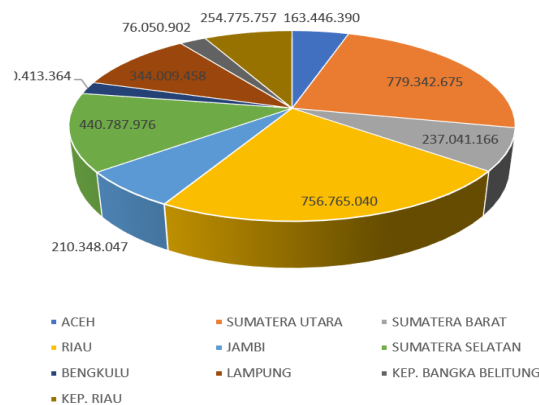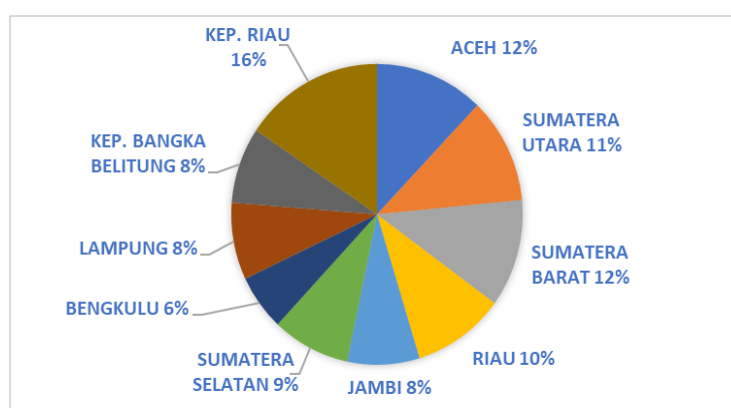

Fig. 1. Average GRDP on The Island of Sumatra

it can be seen that Riau province is the province with the highest GRDP value. Then for the highest GRDP average value, number two is Prov. The well is at 727 billion rupiah. South Sumatra Province is in third position in the order of the largest GRDP on the island of Sumatra, South Sumatra has an average Gross Domestic Product of 412 billion rupiah. The magnitude of the GRDP figures in the three provinces varies, due to different resources in each different region.

Differences in the existing GRDP values are actually influenced by differences in the sectors in each province. Because each province has different advantages, such as the existence of comparative advantages in each region. These comparative advantages include the existence of natural potential (SDA), the ability to master technology and also the ability of managerial processes in production activities so as to be able to provide maximum output. Apart from differences in natural resources, the GRDP value is also related to the existence of unemployment. Unemployment will basically result in sub-optimal output produced, worse, it

will cause the region's economic growth to lag behind. The following is an overview of the average unemployment rate for the 2017 - 2021 period on the island of Sumatra.

The first highest province was the Riau Islands province where during that period the average unemployment rate for the Riau Islands was at the level of 16%. Aceh province with second rank, with an unemployment rate of 12%. According to a report from the Department of Labor and Mobility of the Acehnese population, the reason for the high unemployment rate in Aceh is the lack of a match between *supply* and *demand* to companies in Aceh. then followed by the province of West Sumatra with a figure of 12%. Detailed information show below here :

Fig. 2. Average Unemployment Rate on The Island of Sumatra

Samuelson and Nordhaus in Rizqullah [2] in their study argued that the problem of disparity is inseparable from the problem of unemployment, because the more the burden of unemployment increases, the more difficult it will be for prosperity to be achieved. Other studies argue that high unemployment will result in low regional productivity where unemployment is located and when viewed from a demographic perspective the existence of unemployment will have an impact on high income disparities.

Apart from unemployment and GDP, in general, large population growth is one of the reasons for the unequal distribution of income. Demographic issues are actually a matter of great concern, because demography involves human resources as capital inputs in the economy, so they must be kept under good control. The denser the population that inhabits an area, the narrower the availability of labor. For residents who get a job of course it does not bring problems, but for those who do not work this is certainly a problem. For this reason, below is a table of Sumatran population density figures for the 2017 - 2021 period.

Table 1. Sumatran Population of Density

Province	Population Of Density				
	2017	2018	2019	2020	2021
Aceh	89	90	92	93	92
North Sumatra	196	198	201	203	205
West Sumatra	127	129	130	132	133
Riau	76	77	79	80	75
Jambi	70	70	71	72	72
South Sumatra	90	92	93	94	93
Bengkulu	97	98	99	100	102
Lampung	240	242	244	247	262
Belitung Islands	86	87	88	89	90
Riau Islands	128	132	136	141	129

Referring to the population density table above, Lampung province is the first province with the largest population density on the island of Sumatra, Lampung's population density reaches 247 people/km^2. North Sumatra Province ranks second with a population density of 200 people/km^2. In third place, followed by the Riau Archipelago province with a population density of 133 people/km^2.

Residents essentially have a good influence on the country's economy if these residents work and have income. However, in empirical circumstances this condition does not fully apply, due to different work factors for each individual which results in differences in wages or*income* which they received. This is another factor that causes differences or inequality in income distribution in an area even though these residents live in the same area.

Residents who live in an area who do not get a job will give rise to a new group, in which this group is a group of non-income residents who within a certain period of time will become poor people. In this study, what is meant by poor people are people who are unable to meet their basic needs, both food and non-food. Below is a table of the number of poor people on the island of Sumatra for the period 2017 - 2021.

Table 2. Number of Poor People on The Island of Sumatra

Province	2017	2018	2019	2020	2021	Average
Aceh	1702,41	1670,99	1629,2	1648,82	1684,5	1667,184
North Sumatra	2780,44	2616,97	2542,54	2640,01	2616,93	2639,378
West Sumatra	724,5	710,37	691,31	709,02	710,6	709,16
Riau	1011,01	994,7	974,64	974,61	997,47	990,486
Jambi	565,16	563,16	547,69	565,9	573,72	563,126
South Sumatra	2173,68	2144,67	2140,9	2201,23	2230,37	2178,17
Bengkulu	619,6	605,36	600,3	608,58	597,79	606,326
Lampung	2215,47	2188,65	2105,14	2140,46	2090,95	2148,134
Kep. Bangka Belitung	150,29	146,19	135,75	140,44	142,41	143,016
Kep. Riau	253,8	257,04	256,22	274,58	282,21	264,77

Refer to the table above regarding the number of poor people by province on the island of Sumatra. North Sumatra Province is the province with the largest average poor population with an average of 2,639.378 thousand people. The second province with an average poverty rate is the province of South Sumatra, which has an average of 2,178.17 thousand people. The third province with the largest average poor population is Lampung province, which has an average of 2,148.134 thousand people. Poverty in a broad definition is the inability of individuals to fulfill their needs relative to the individual's self-view. The world bank provides a standard that poor people are living conditions where individuals earn below USD 1$/day.

The large number of differences in numbers or large differences in the several variables shown above indirectly informs that there is a disparity between regions in each province on the island of Sumatra. So that in this analysis a number of macroeconomic variables are examined in the problem of income disparity on the island of Sumatra by estimating GRDP, open unemployment rate, population density and number of poor people as a determinant of income disparity in Sumatra. So with that the author is interested in researching with the title*"Determinants of Income Disparity in 10 Provinces on Sumatra Island for the 2017 – 2021 period"*.

2 Literatur Review

Income Disparity
Income disparity is a condition in which there is inequality of the existing income distribution. The condition of income inequality can be seen from the existence of significant differences in income between residents in a region. Todaro [3] says that the share of income from high-income residents is much larger, in line with economic growth. This process makes the rich get richer and the poor keep getting poorer. A more equitable distribution of income can serve as an indicator of the level of prosperity of the population.

Gross Regional Domestic Product

GRDP in general is *value added* arising from existing production processes in the region during a certain period of year. The magnitude of the existing GRDP figures has an impact on the percentage of economic growth in the region, in this case, economic growth refers to the increasing stages of real gross product. In other words, the amount of GRDP in a region also supports the idea that the economy develops or grows if there is growth in real output.

Open Unemployment Rate

According to a basic definition used globally, an individual who is actively looking for a job at a certain wage level but is unable to find one is considered unemployed. Unemployment is a waste of resources. The unemployed have the opportunity to contribute to national income, but they cannot do so. Finding a job that matches your abilities will be very interesting after the search is complete, and individuals who hope to work in a high-paying company at a balance point feel pleasure when a vacancy opens. This unemployment rate is calculated from the division between the number of unemployed and the number of the labor force multiplied by 100 so that the unit of the open unemployment rate is percent.

Population Density

The total population divided by the area is known as population density. The standard unit for measuring population is per Km^2 or every 1 $mile^2$. Unequal population distribution is a matter of population density. Population density in an area will lead to the prosecution of aspects of the provision of public facilities and infrastructure, which of course will be borne by the local government. To fulfill this request, controlling population density is important.

Number of poor people

Poverty according to this study is defined as the inability to meet one's basic non-food and food needs. If the average monthly expenditure of the population per person is less than the poverty line, then they are considered poor.

3 Data analysis and Methodology

Variable operational definitions

this research using secondary data that sourced form Central Bureau of Statistics. The following variables in this research are :
Y   : Williamson index
X1 : GRDP
X2 : Open unemployment rate
X3 : population density
X4 : number of poor people

Data type and sources

This study belongs to the type of descriptive research with a quantitative approach method. This research seeks to explain how the response to regional income disparities as measured using the Williamson index to GRDP, the open unemployment rate, population density and the number of poor people are processed and compiled using panel data from 2017 – 2021 on the island of Sumatra.

analysis methods

In this study the method that will be used is the panel data regression analysis method (panel data). The tool for analyzing this data uses the E-views 10. The basic model formed in this research is :

$$IW_{it} = \beta_0 + \beta_1 lnPDRB_{it} + \beta_2 TPT_{it} + \beta_3 lnDP + \beta_4\ lnPM + e_{it}$$

Information :

|	
IW	= Williamson index
PDRB	= GRDP
TPT	= Open unemployment rate
DP	= population density
PMSK	= number of poor people
β_0	= constant
$\beta_1 - \beta_3$	= independent variable regression coefficient
e	= Error term
i	= Province
t	= Time

4 Research results and discussion

The Effect of Gross Regional Domestic Product (GRDP) on Regional Income Disparities in 10 Provinces on Sumatra Island in 2017 – 2021

A high GRDP value reflects the region's success in optimizing the resources available and owned. The ability to optimize GRDP will produce value that can encourage a region to become more advanced, not only in one sector but the entire sector can be stimulated to move positively. The positive impact of regional economic growth which is known through the

GRDP value will encourage other regions to compete to increase their GRDP value. The results of statistical calculations show that GRDP has a significant negative impact with a coefficient of -0.018439. If the GRDP value increases by 1 billion rupiah, the income disparity value will decrease by 0.18 assuming all variables are considered constant. This finding is in accordance with the hypothesis presented by Kuznets, where the Kuznets Hypothesis provides an illustration of the relationship between economic growth and negatively correlated income disparities.

GRDP is a form of reflection of whether the people in a region are prosperous or not, when the GRDP value shows a high figure, the regional level of prosperity tends to follow the movement of the GRDP value, but each region has limited production factors which means that the GRDP value is not always used as a measure of prosperity. Previous research told the relationship or correlation between the growth in the value of gross regional domestic product and income disparities has a negative correlation, it is said that this is because a good economy which is marked by a large gross regional domestic product figure can indicate that the level of prosperity of society in a region or province is considered high, in this case a good economy is considered sufficient in terms of providing employment opportunities, which of course can reduce the unemployment rate so that groups of people who were previously unemployed and did not earn income change to earning income. Below is presented an average description of the response to income disparities which is denoted by the Williamson Index and GRDP.
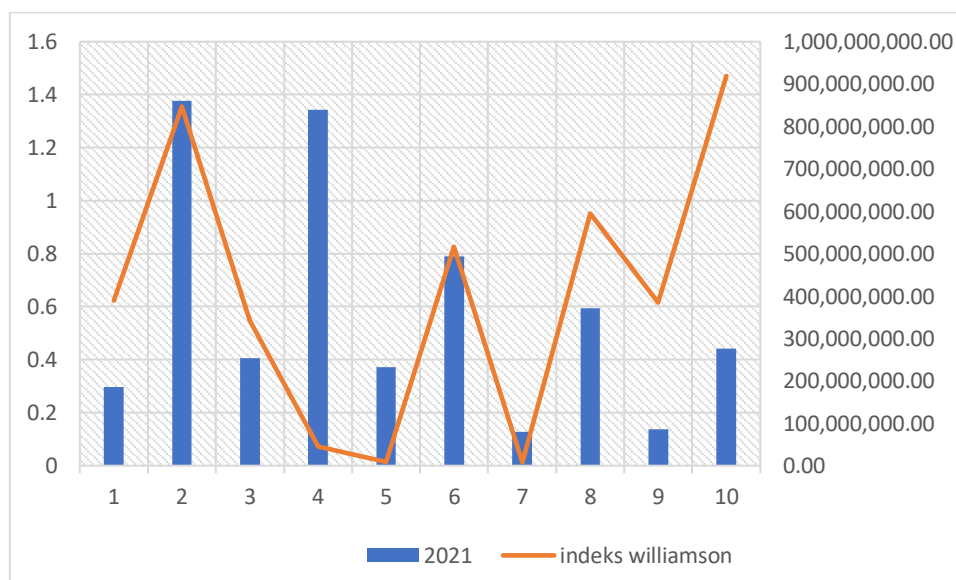
Fig. 3. Correlation Between Williamson Indexs and GRDP

The picture above shows a unidirectional relationship between gross regional domestic product and the Williamson Index. When GDP increases, the income disparity figure as measured by the Williamson index also increases. This occurs as a result of the increasing value of gross regional domestic product in each province, so the income disparity gap will increase due to the inability of one region to balance the economy with that of another region.

However, the comparison between the Williamson index and gross regional domestic product is contrary to the author's hypothesis. In the hypothesis the author states that there is a negative influence, if gross regional domestic product increases then income disparities will decrease with the cateris paribus assumption.

The Effect of the Open Unemployment Rate (TPT) on Regional Income Disparities in 10 Provinces on Sumatra Island in 2017 – 2021.

Unemployment is the condition of individuals who are classified as in the labor force and want to work but have not found a job According to Central Bureau of Statistics the unemployment rate includes those who are not working but are looking for work, preparing for a new business, or those who are working but have not started work but are not looking for work. A person without work does not earn wages. The more groups of workers who lack income, the higher the unemployment rate. Too much unemployment can reduce the income of low-income groups and increase income inequality

Based on statistical analysis, the Open Unemployment Rate Variable has a negative impact with a coefficient of -0.020611 if TPT increases by 1%, regional income disparities decrease by 0.02. This result is consistent with Nielson & Alderson's (2015)[5] statement that unemployment in the United States in the 1980s saw a very significant and negative effect of the unemployment rate on regional income disparity figures which showed that unemployment actually reduced the income gap.

However, Nielson and Alderson's study suggests that any unemployment rate will not affect regional income disparities. The lack of influence of unemployment on income disparities can occur due to the assistance/subsidies provided by the government. The negative relationship between the open unemployment rate and income disparity on the island of Sumatra in particular can be caused by policies carried out by the government, such as social assistance from the government in the form of the Family Hope Program (PKH), Non-Cash Food Assistance (BPNT), Prosperous Rice (Rastra). , Village Funds, Indonesia Healthy Card (KIS) and Indonesia Smart Card (KIP). The existence of this assistance can ease the burden on the community because the necessities of life can be fulfilled, although it is still not evenly distributed throughout Indonesia. In addition, the necessities of life for the unemployed are mostly still dependent on working families, and using their assets/savings to get jobs and wages. This type of assistance is in accordance with what Nielson and Alderson said that unemployment will have an ambiguous impact because it will give rise to two different things, it can have a positive impact if there is no subsidy/assistance and it can have a negative impact when the government provides subsidies/assistance. Below the author presents an overview of the response of the open unemployment rate to income disparities represented by the Williamson index.
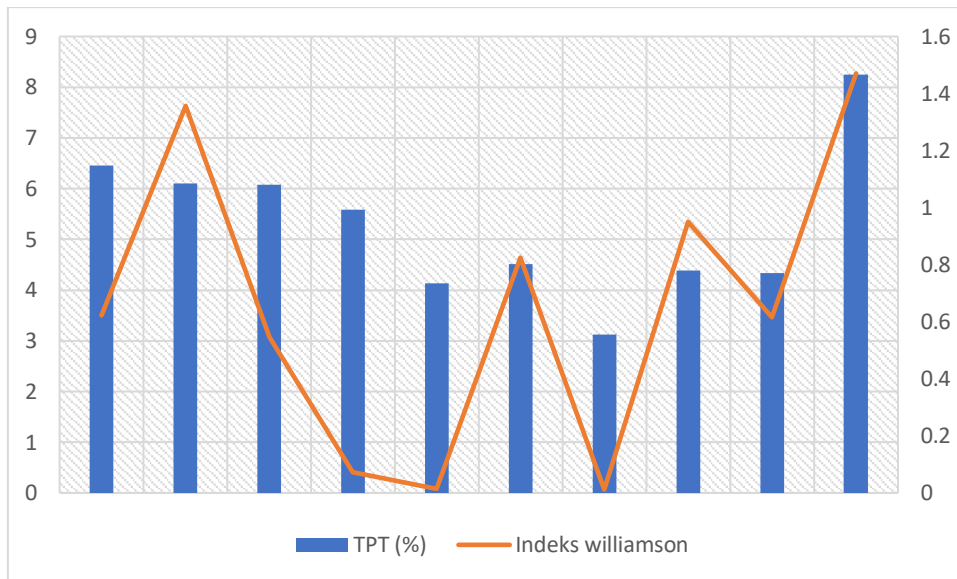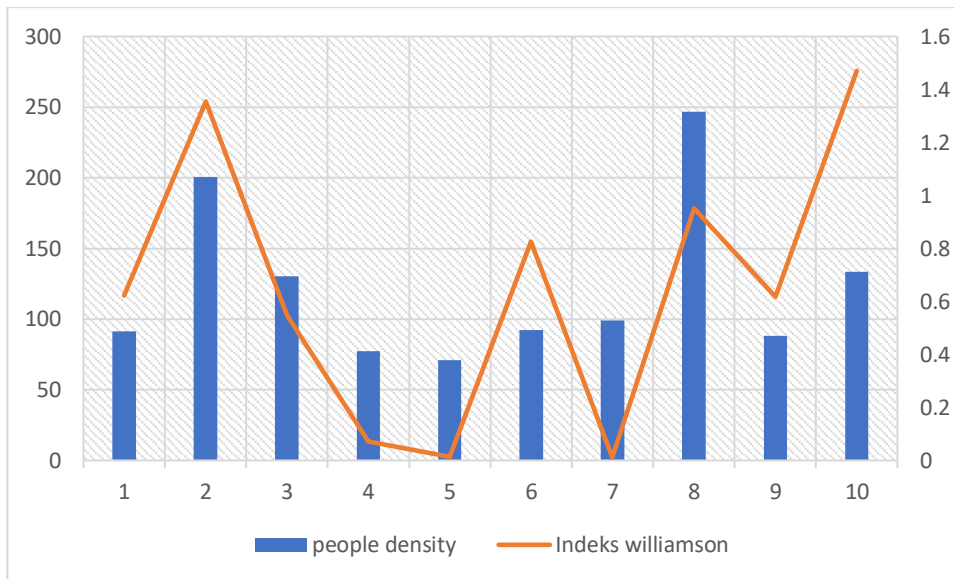
Fig. 4. Correlation Between Williamson Indexs and Open Unemployment Rate

The picture above shows that when the unemployment rate decreases, income disparity also decreases or it can be said to have a positive relationship, this is different from the results of the research that the author presents, which has a negative effect. Alderson in his research also revealed that there is an ambiguous correlation between the open unemployment rate and income disparity.

The Influence of Population Density (DP) on Regional Income Disparities in 10 Provinces on the Island of Sumatra in 2017 – 2021.

Dense population in an area leads to the problem of providing employment, if in an area the population continues to increase without being matched by increased employment, this will cause unemployment. Residents who do not get a job will of course be a burden to the government, because unemployed residents cannot contribute to the economy in the region, which will result in an increase in regional income. The results of statistical calculations show that if population density has a significant positive effect with a coefficient value of 0.801031, this result means that if the population density increases by 1 person/km2, the regional income disparity will increase by 0.80.

Below the author presents a graph of the comparative relationship between the Williamson index and population density.
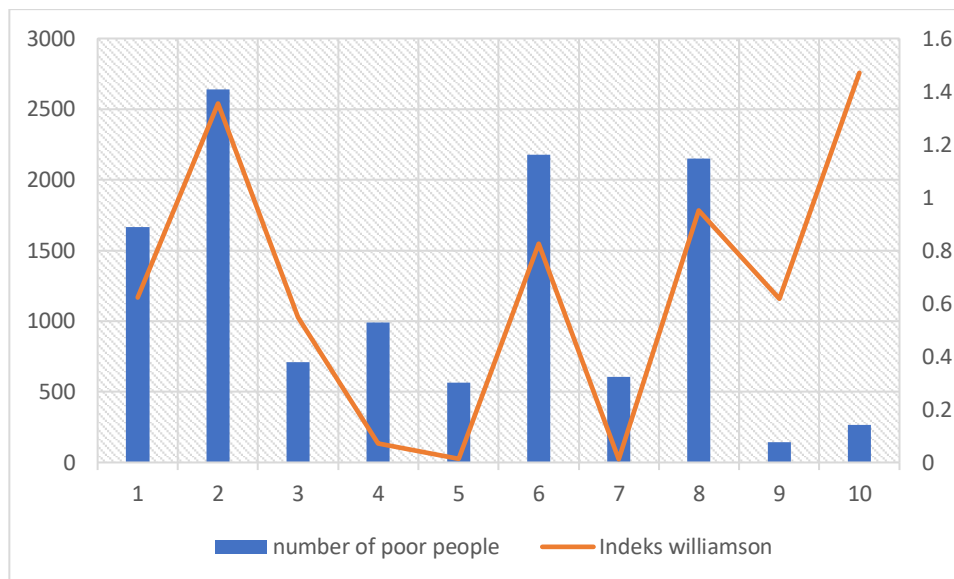
Fig. 5. Correlation Between Williamson Indexs and People Density

The figure above illustrates a unidirectional relationship between population density and the Williamson index, when the population density increases, the Williamson index value also increases. This is certainly in line with the results of research which shows a positive relationship, because the population continues to increase in a region but does not include additional employment opportunities or employment opportunities. This will cause problems due to the absence of contributions from unemployed individuals to the economy in the region so that individuals those who are unproductive and live in an area will become a burden on the economy.

The Effect of the Number of Poor Population (PM) on Regional Income Disparities in 10 Provinces on Sumatra Island in 2017 – 2021.

The poverty variable has no partial effect on regional income disparities. In the test results, the relationship between poverty and income inequality is positive with a coefficient of 0.187566. This implies that income inequality of 0.18 increases or decreases depending on the level of poverty. One element that can influence income inequality is poverty. Because basic needs are not met, poverty arises. When poverty is reduced, it means people can meet their basic needs. Because income increases, minimum needs are met. Income disparities can be reduced due to people's higher income because their income gap will be closed. This is closely related to government policies to fight poverty, such as free job training programs for those who want to start their own business and earn an income that can ultimately meet their basic needs. In the long term, this helps reduce economic inequality. The findings of this study are consistent with a number of previous studies, namely the study by Apergis who found that poverty has a positive and significant impact in the short and long term on income inequality. poverty and income inequality have a positive and significant relationship. Below the author presents a comparison graph between the number of poor people and the Williamson index.

Fig. 6. Correlation Between Williamson Indexs and Number of Poor People

The picture above explains that there is a trend of movement that tends to be positive or unidirectional, in the initial period it can be seen that the movement is not too significant but entering the end of the research period it is seen that there is quite a large movement. Overall, the graph of the relationship above is in line with research results which show a positive relationship between the two Williamson index variables and the number of poor people, these results are also in accordance with previous studies.

Influence of GRDP, Open unemployment rate, population density and number of poor people on income disparities
the results of the F test on the OLS regression model where the F-count is 1784.754 > 2.81, so that if the F-count > F-table with a confidence level of 95 then the hypothesis concludes that rejecting H_0 and accepting H_a. so this explains that the independent variables in this study simultaneously have a statistically significant influence on the dependent variable, namely Regional Income Disparity.

Implication and suggestion for future research
the government as the policy maker must be more pro with policies that benefit the community, because each individual will have an impact on the size of the GRDP. The government must also pay attention to the existence of unemployed people living in an area so that the unemployment rate can be controlled by providing additional employment opportunities or job training to increase job opportunities available. the problem of overcrowding has been carried out by the government by transmigration but in reality this program over the years the quota provided has decreased so this needs to be considered to consider its implementation.

References

[1] N. Aida, F. Y. Afif, and T. S. Peni, "Krisis Global dan Pertumbuhan Ekonomi di Indonesia," *J. Ekon. Pembang.*, vol. 10, no. 1, pp. 46–55, 2021, doi: 10.23960/jep.v10i1.214.

[2] A. B. Rizqullah, "Determinan Ketimpangan Pendapatan di Indonesia Bagian Timur," *J. Ilm. Mhs. FEB Univ. Brawijaya*, vol. 9, 2021, [Online]. Available: http://repository.unsoed.ac.id/10132/

[3] M. P. Todaro and S. C. Smith, *Economic Developement*. 2012. [Online]. Available: http://eco.eco.basu.ac.ir/BasuContentFiles/57/57304a77-1269-4081-bd5b-4c66b84b06a4.pdf