

MAPPING OF THE TRIGGER VARIABLES OF DISTRIBUTION OF INCOME DISTRIBUTION IN ACEH PROVINCE BEFORE AND AFTER THE COVID-19 PANDEMIC

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ABSTRACT

The income distribution gap (KDP) between regions is an unavoidable reality in both developed and developing countries, and is a major concern during the pandemic. The COVID-19 pandemic that has emerged since 2019, has caused governments in various countries to set various virus prevention policies that have hampered and restricted people's economic activities, resulting in higher KDP and dependence on the government. The higher the KDP number, it can indicate the condition of uneven economic development in each region. In addition, each region has different characteristics of economic problems, therefore strategic policies are needed for each region to be able to overcome regional problems. This strategic policy is also expected to overcome economic disparities between regions. So that strategic policies can be formulated properly and appropriately, it is necessary to conduct research on macroeconomic variables that affect the KDP of each region. This study aims to analyze how big the gap in income distribution between regions in districts/cities in Aceh Province is and how much influence the variables of Gross Regional Domestic Product (GRDP), population and open unemployment rate (TPT) have on KDP in districts/cities in the province. Aceh before and after the covid-19 pandemic. The research was conducted by calculating the Williamson Index to determine the size of the income gap between regions, and the data analysis model using panel data regression models. The results of the Williamson index calculation show that KDP in the district / city of Aceh Province during the period before the pandemic was in the low category and increased in the period after the pandemic. Even some areas such as Aceh Besar, North Aceh and Bireuen, the KDP is in the moderate category during the pandemic. The results of the regression analysis show that GRDP does not have a dominant effect on KDP districts/cities in Aceh Province before and after the covid 19 pandemic. Meanwhile, Population and TPT have a positive and significant effect on districts/cities in Aceh Province before and after the covid 19 pandemic. Results Gini ratio constant calculation shows that Langsa is the city with the largest Gini Ratio value from other regions,

Keywords: *Inequality of Income Distribution (KDP), Gross Regional Domestic Product (GRDP), Total Population, Open Unemployment Rate (TPT)*

1. INTRODUCTION

1.1. Problem Background

Regional economic development is a process in which local governments and communities manage every available resource and can form a pattern of cooperation between local governments and the private sector. (Muttaqim, 2014) Development is said to be successful and sustainable if there are changes that are multidimensional, and include changes in social structures, community attitudes and changes in government structures.

In general, in realizing sustainable economic development, the government will experience a trade off between maintaining economic growth or reducing Inequality of Income Distribution

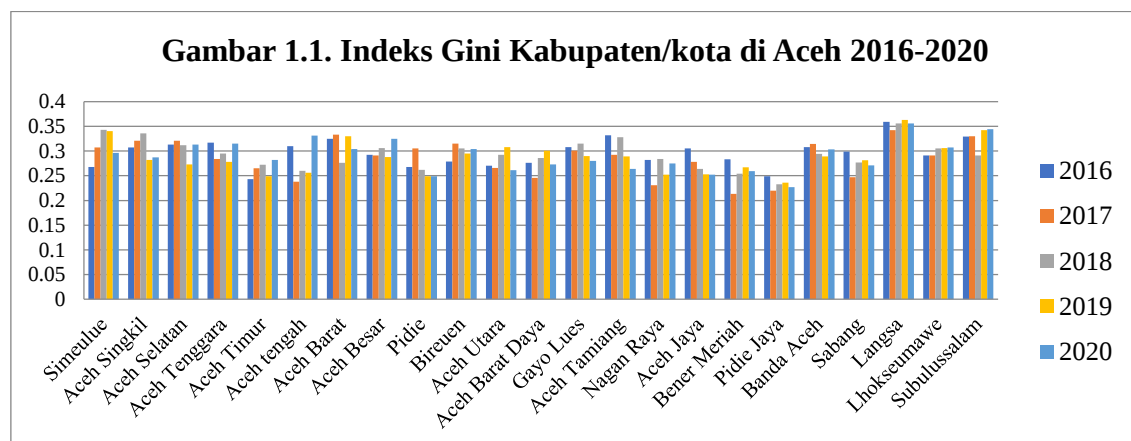
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(KDP). because it is impossible for both to be achieved at the same time, prioritizing one will sacrifice the other (Siara, 2021). Reducing inequality in income distribution should be the main focus in regional economic development, because the reduction in KDP will indicate an increase in people's welfare so that in the long term it will be able to increase the country's economic growth. (BPS DIY, 2020).

KDP is a reality that exists in both developed and developing countries, and is increasingly becoming a major concern during the current pandemic. The pandemic due to the corona virus has caused governments in various countries to set various policies that have hampered and restricted people's economic activities, resulting in higher KDP and dependence on the government. In addition, each region has the characteristics of different economic problems. Therefore, strategic policies are needed for each region to be able to overcome these problems. This strategic policy is expected to overcome economic disparities between regions. The lower the inequality rate between regions, it can indicate positive and equitable economic conditions in each region.

Aceh is one of the provinces that has felt the direct impact of the COVID-19 pandemic. KDP in districts/cities throughout the province of Aceh underwent significant changes since the beginning of the pandemic, although the increase in KDP during the pandemic was still relatively low. The economic condition of Aceh Province is increasingly interesting to study because when the KDP is low, the relative poverty level of Aceh Province increases, even Aceh is declared the poorest province in Sumatra in the last 3 years (BPS, 2021). This KDP condition can be seen from the Gini Ratio Index.



Source: BPS, 2020

From the picture above, it is known that the Gini ratio of districts/cities throughout the province of Aceh is volatile but the value is below 0.35, meaning that KDP in Aceh is relatively low. On the other hand, as explained above, Aceh Province is classified as a province whose poverty rate continues to increase and is the poorest province in Sumatra, even though inequality in income distribution is an indicator of relative poverty. It should be based on this theory, when the Gini ratio is low, the KDP is also low, which means the poverty rate is low, but this theory does not apply in Aceh Province, therefore it is necessary to conduct a more in-depth study and map the variables causing this condition.

1.2. Formulation of the problem

This study will focus on mapping variables that are suspected to be the trigger for an increase in KDP in districts/cities in Aceh Province before and after the COVID-19 pandemic. The limits of the variables to be analyzed include GRDP, total population and TPT in each district. Therefore, the formulation of this research is How big is the income distribution gap between districts/cities in Aceh Province and how big is the influence of the GRDP, population and TPT variables on KDP in districts/cities in Aceh Province before and after the covid-19 pandemic?



1.3. Research purposes

The objectives of this study are: To find out how big the gap in the distribution of income between regions is in the districts/cities of Aceh Province and how much influence the variables of GRDP, population and TPT have on KDP in districts in Aceh Province before and after the covid-19 pandemic.

2. THEORETICAL FOUNDATION

2.1. Understanding Income Inequality

Income inequality is the difference in the amount of income received by the community, resulting in greater income differences between groups in society (Sjafrizal, 2012). Kuznet revealed that inequality in income in the early stages of development tends to increase due to the economy experiencing a large decline in income distribution, then after the next stage of development income inequality tends to decrease because income distribution is more even. (Hutabarat, 2015).

2.2. Size Inequality

Measuring income inequality between regions can be through the calculation of the Williamson index or the Gini index. The basis of calculation using the Williamson Index is to use GRDP per Capita in relation to the number of residents per region. The measurement results of the Williamson index are indicated by the numbers 0 to 1 or $0 < IW < 1$, if the Williamson index is getting closer to 0 then the inequality between regions is low and vice versa if the Williamson index is getting closer to 1, the inequality is getting higher. In addition to the Williamson index, the Gini Index is also used. According to the Central Bureau of Statistics, the Gini Index is based on the Lorenz curve, ie a cumulative expenditure curve that compares the distribution of a certain variable (eg income) with a uniform distribution that represents the cumulative percentage of the population. The Gini Index helps the government in analyzing the level of community economic capacity because it is an indicator of the degree of justice in a country (Henri, 2018).

2.3. Factors Causing Inequality

Some of the main factors that cause inequality between regions according to Sjafrizal (2012) are:

1. Differences in Content of Natural Resources, Differences in content of natural resources will affect production activities in the area concerned. Regions with a high content of natural resources will be able to produce certain goods at a relatively low cost when compared to other regions that have a lower content of natural resources. This condition encourages the regional economic growth to be faster.
2. Differences in Demographic Conditions, Differences in demographic conditions include differences in growth rates and population structure, differences in education and health levels, differences in employment conditions and differences in the behavior and habits of the people of the area concerned. Demographic conditions will affect the work productivity of the local community. Regions with good demographic conditions will tend to have higher work productivity so that this will encourage increased investment which will increase the provision of employment and economic growth of the area.
3. The lack of smooth mobility of goods and services, goods and services includes inter-regional trade activities and migration. The reason is that if the mobility is not smooth, the excess production in one area cannot be sold to other areas in need. As a result, development inequality between regions will tend to be high, making it difficult for underdeveloped regions to encourage the development process.
4. Concentration of regional economic activity, Regional economic growth will tend to be faster in an area where the concentration of economic activity is quite large. This condition will further

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encourage the regional development process through increasing the provision of jobs and the level of community income.

5. Allocation of development funds between regions. This allocation of funds can come from the government or the private sector. In an autonomous government system, more government funds will be allocated to the regions so that development inequality between regions will tend to be lower. For private investment, it is more determined by market forces, where the advantage of location owned by a region is a force that plays a large role in attracting private investment. The location advantage is determined by the cost of transporting both raw materials and production results that must be paid by the entrepreneur, differences in labor wages, market concentration, the level of business competition and land rent. Therefore, investment will tend to be more in urban areas than in rural areas.

2.4. Gross Regional Domestic Product

According to the Central Statistics Agency (BPS) Gross Regional Domestic Product (GRDP) can be interpreted as the amount of added value produced by all business units in a region, or is the total value of final goods and services produced by all economic units in a region (Saputra, 2011).

Gross Regional Domestic Product (GDP) is one of the important indicators to determine the economic conditions in an area within a certain period, both on the basis of current prices and on the basis of constant prices. GRDP on the basis of current prices describes the added value of goods and services which is calculated using prices in the current year, while GRDP on the basis of constant prices shows the added value of these goods and services which is calculated using prices prevailing in one particular year as the base year.

3. RESEARCH METHODS

3.1. Research Location and Object

The research was carried out in all districts/cities in Aceh Province, with the research objects being KDP, GRDP, Total Population, and TPT.

3.2. Research design

This study was designed as a descriptive research from quantitative data. Descriptive design aims to explain something, such as explaining the characteristics of a relevant group, estimating the percentage of the nucleus in a certain population that shows certain behavior, knowing the perception of product characteristics, knowing how big the relationship of a variable is and to find out specific predictions (Malhotra, 2007). In this study, the variables that trigger the occurrence of KDP will be mapped. By looking at the relationship and the magnitude of the influence of the variables that have been determined previously.

3.3. Data collection technique

Data collection techniques were carried out using observation techniques, literature studies, mass media content analysis and documentation studies. The initial observation technique is to pay attention to the condition of the community in each region, followed by a literature study collected from the Central Statistics Agency (BPS) Aceh, and various libraries that can assist in discussing the problem.

a. Williamson Index Calculation

The Williamson index is used to determine the size of the income gap between regions in the same area. The Williamson index examines the relationship between regional disparities and the economic development clause.



$$IW = \frac{2}{n} \sqrt{\frac{\sum_{i=1}^n (Y_i - \bar{Y})^2 / f_i}{\sum_{i=1}^n f_i}}$$

Note: IW = value / Williamson index = regional inequality index

Y_i = Income per capita of each district/city

$\bar{Y}$ = Provincial income per capita

f_i = Total population of each district/city

n = Total population of the province

The size of the inequality of income distribution that occurs in an area can be seen from the value of the Williamson Index, the value of the Williamson index ranges from 0 to 1 (one). The closer the IW value is to 1, the higher the income distribution gap between districts in the province. If IW = 0 the income distribution gap does not occur or the development process is very even, and if IW = 1 the income distribution gap is very high or the development process is very uneven.

b. Panel Data Regression Model

This panel data regression is used to determine the effect of GRDP, Population and Open Unemployment on income inequality in districts/cities in Aceh Province. The panel data regression equation model in this study is as follows

$$KDP_{it} = \alpha + \beta_1 GRDP_{it} + \beta_2 JP_{it} + \beta_3 TPT_{it} + \epsilon_{it}$$

Information :

KDP = Income distribution gap, α = Constant, 1 2 3 = Regression coefficient, GRDP = gross regional domestic product, JP = Total Population, TPT = Open Unemployment Rate, $i : 1, 2, 3 \dots N$ (cross section), $t : 1, 2, 3 \dots T$ (time series)

3.4. Hypothesis test

The test of the panel regression model criteria is carried out using three criteria:

- Economic Criteria.** The economic criteria test is carried out by looking at the sign and magnitude of the regression coefficient which shows the direction and magnitude of the influence of the independent variables on the dependent variable.
- Statistical criteria.** The criteria test was carried out by partial test (t test) and simultaneous test (F test) and the coefficient of determination (R^2) and correlation test (R).
- Econometric criteria.** Econometric criteria test was conducted for a series of assumptions consisting of multicollinearity, heteroscedasticity and autocorrelation to obtain BLUE (Best Linear Unbiased Estimator) parameter values.

Econometric tests were also conducted to find and compare the most appropriate model in panel data estimation. Test In the analysis of the panel data regression model, there are three kinds of approaches consisting of a pooled least square approach, a fixed effect approach, and a random effect approach (Nachrowi, 2006).

3.5. Model Determinant Test in panel regression

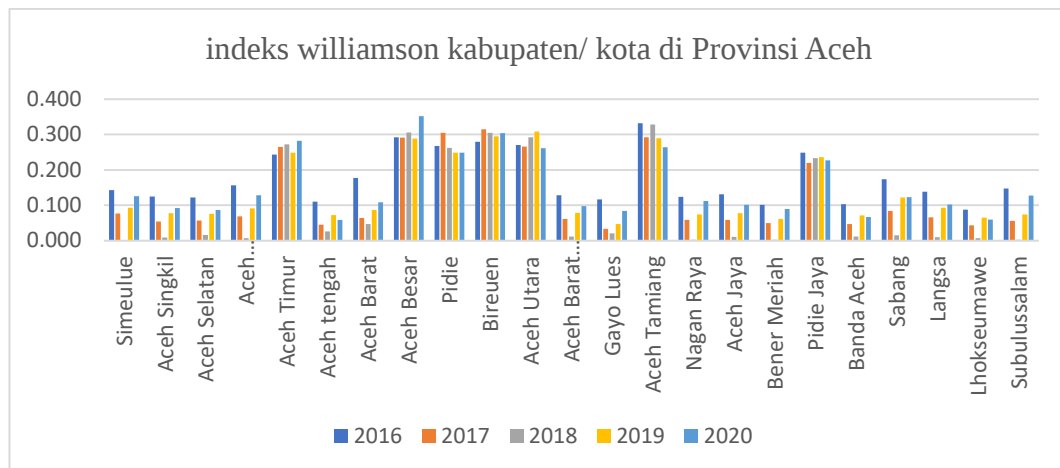
In selecting the model that will be used in a study, it is necessary to carry out statistical considerations, namely with the aim of choosing which model is the right one to use. The determinants of the model in the panel regression used are the Chow test, the Hausman test and the Langrange multiplier test.

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4. RESEARCH RESULTS

4.1. Williamson Index Calculation



From the picture above, it can be explained that the area with the highest inequality is GGI, which occurred in 2020. In Aceh Besar District, the index value of 0.352%, this high income inequality is caused by very different regional incomes, there are potential regions with very optimal regional asset management so that they contribute to high GRDP income while other regions in managing regional potential are not optimal so that regional income is still little received.

4.2 CLASSICAL ASSUMPTION TEST

A. Multicollinearity Test

Multicollinearity test aims to determine whether in the regression model there is a correlation between the independent variables. If there is a correlation, then there is multicollinearity where a good regression model should not have a correlation between the independent variables. The results of the multicollinearity test for this study are as follows

	GD P	TOTAL POPULATION	TPT
	1.00		
GDP	00000	0.529797	0.365632
TOTAL	0.52		
POPULATION	9797	1.0000000	0.156443
	0.36		
TPT	5632	0.156443	1.0000000

Based on the table above, it can be concluded that the value of each independent variable is less than 0.8, meaning that there is no multicollinearity in the regression model.

B. Heteroscedasticity Test

A good model is one with homoscedasticity or no heteroscedasticity (Ghozali, 2011). In this study, the method used to detect the presence or absence of heteroscedasticity using the White Test.

Heteroskedasticity Test: White

	2.090		
F-statistics	936	Prob. F(3,106)	0.1058

Obs*R-squared	6.145	Prob. Chi-Square(3)	0.1047
Scaled explained SS	11.35	Prob. Chi-Square(3)	0.0100

Based on Table 4.2 it can be seen the value of Obs*R-squared is 6.145825 with a probability value of 0.1047 > (5%). So it can be said that this research is free from heteroscedasticity.

C. Autocorrelation Test

The autocorrelation test is carried out through testing the Durbin Watson Test to determine whether or not there is autocorrelation in a regression model. The basis for decision making is if Durbin Watson is between DU and 4-DU, it means that there is no autocorrelation. The value of the Durbin Watson test on the autocorrelation test can be seen in table 4.3.

Effects Specification			
		SD	Rho
Cross-section random		0.0220	0.52
		83	86
Idiosyncratic random		0.0208	0.47
		54	14
Weighted Statistics			
	0.040		0.11
R-squared	379	Mean dependent var	3708
Adjusted R-squared	0.015		0.02
	126	SD dependent var	1425
	0.021		0.05
SE of regression	042	Sum squared resid	0478
	1.598		1.93
F-statistics	956	Durbin-Watson stat	1059
	0.193		
Prob(F-statistic)	555		

After calculating the DW table, the DW value can be seen where it can be seen in the following figure:

Positive autocorrelation	DL	1	DU	No Autocorrelation	4-DU	1	4-DL	Positive autocorrelation
0	1.6427	1.7496	1.9310	2.2504	2.3573	4		

Based on the results of the Durbin-Watson calculation, the position of DW is between DU and (4-DU), so it can be concluded that in this model there is no autocorrelation.

4.3 PANEL DATA REGRESSION MODEL DETERMINATION TEST

1. Chow Test

The chow test was used to compare the common effect regression model with the fixed effect. The basis for decision making in the Chow test is seen from the probability cross-section value. The table of the results of the chow test in this study is as follows:

Redundant Fixed Effects Tests

Equation: Untitled

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Test cross-section fixed effects

Effects Test	Statistics	df	Prob.
Cross-section F	6.964647 115.14021	(22.89)	0.0000
Cross-section Chi-square	3	22	0.0000

Based on the table above, it shows that the probability value of the Chi Square row in the Chow test is 0.0000, meaning that the best model is FEM. Because the probability value is less than (5%).

2. Hausman Test

The Hausman test is used in testing to find out which model will be used by comparing the random effect regression model with the fixed effect. In decision making, the Hausman test can be done by looking at the p-value if it is significant $< (\alpha = 5\%)$ then the regression model chosen is the fixed effect. However, if the p-value is not significant $> (\alpha = 5\%)$ then the regression model chosen is random effect.

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Cross-section random	5.7677 65	3	0.12 35

From the results of the Hausman test, the results of the chi-square distribution value are 5.767765 with a probability of 0.1235 $> 5\%$. So statistically reject H_a and accept H_o . So according to the estimation model, the right model to use is the random effect estimation model.

5. CONCLUSIONS AND SUGGESTION

5.1. CONCLUSION

Based on the results of research on mapping variables that trigger inequality in income distribution in districts/cities of Aceh province before and after the COVID-19 pandemic, the following conclusions can be drawn:

1. Williamson index calculation shows KDP in the district/city of Aceh Province during the pre-pandemic period was in the low category and increased in the post-pandemic period. However, the inequality that occurs is still in the category of moderate inequality.
2. The results of the regression analysis show that GRDP has no significant effect on Income Inequality in the districts/cities of Aceh province before and after the covid 19 pandemic.
3. Variable Population and TPT have a positive and significant impact on income inequality in the districts/cities of Aceh province before and after the covid 19 pandemic.
4. The regression results show that TPT has no significant effect on Income Inequality in the Eastern Region of Aceh Province.

5. The results of the calculation of the KDP constant show that Langsa is the city with the largest Gini Ratio value from other regions, which means that the intra-regional KDP of Langsa is still high compared to other districts/cities in Aceh Province.

5.2.SUGGESTION

Based on the conclusions from the results of the study, the authors can provide several recommendations.

1. Aceh KDP which is included in the medium category needs to be followed up with the implementation of mutually supportive economic and non-economic policies so that KDP can improve so that the poverty level can be reduced as well.
2. The variables that have been mapped affect the KDP districts/cities in Aceh Province can be used as a reference for policy making so that the policies taken can be felt by the community.
3. The increase in economic welfare, which is usually measured through an increase in GRDP per capita, needs to be followed by an even distribution of the economic sector in all regions. Increased labor participation in all regions also needs to be considered in order to distribute the population evenly and prevent the high flow of urbanization.

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MAPPING OF THE TRIGGER VARIABLES OF DISTRIBUTION OF INCOME DISTRIBUTION IN ACEH PROVINCE BEFORE AND AFTER THE COVID-19 PANDEMIC

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