Analysis of Factors That Influence the Interdition of District/City in the Province North Sumatra

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***Abstract*— This study aims to determine the effect of the Human Development Index (HDI), Economic Growth, Poor Population, Government Expenditures on Health Education and Government Expenditures on inequality between regions in North Sumatra. The analytical method used in this study is a descriptive analysis method and also the method of multiple regression analysis with the Fixed Effect method using panel data from 33 districts/cities from 2012-2016. The data of this study are secondary data originating from the Central Sumatra Provincial Statistics Agency and the Directorate General of Fiscal Balance, the Ministry of Finance which was downloaded through the official website of each institution. The results showed that economic growth, the number of poor people, and government expenditure in the health sector had a positive and significant effect on income inequality in North Sumatra. While government spending in education has a negative and significant effect on income inequality in North Sumatra. The variable Human Development Index (HDI) has a negative and insignificant effect on income inequality in the North Sumatra region. The estimation results also show that the variation in the change in the value of the non-inequality-free variable can be explained simultaneously by the independent variables namely the variables of HDI, PE, PO, DP, and DK of 99.42% while the remaining 0.58% is explained by factors others that are not included in the model.**

Keywords: Inequality, HDI, Economic Growth, Poor Population, Government Expenditures in Education and Health

I. INTRODUCTION

A. Background of the problem

Development disparities occur on a regional and national scale. In the national scope, the imbalance of economic development between regions is evident. Development inequality is often a serious problem and if it cannot be eliminated carefully it can lead to more complex crises such as population, economic, social, political and environmental problems and in the macro context is very detrimental to the development process and results to be achieved by an area.

Inequality that is most commonly discussed is economic inequality. Economic inequality is often used as an indicator of the difference in average per capita income, between income level groups, between employment groups, and / or between regions. The average per capita income of a region can be simplified into Gross Regional Domestic Product divided by the population. Another method that can be used is to base it on personal income approached by the consumption approach (Widiarto, 2001). In measuring regional economic development inequality the Williamson Index is used.

Inequality has both positive and negative impacts. The positive impact of inequality is that it can encourage other less developed regions to be able to compete and increase their growth in order to improve their welfare. While the negative impacts of extreme inequality include economic inefficiency, weakening social stability and solidarity, and high inequality which is generally seen as unfair (Todaro, 2000).

Gaps or disparities between regions are a logical consequence of the development process which is a stage of change in development itself. Excessive differences in levels of progress between regions will cause adverse effects and dominate beneficial effects on regional growth. In addition to economic growth and economic inequality, the development process also aims to eliminate and reduce poverty, income inequality and unemployment.

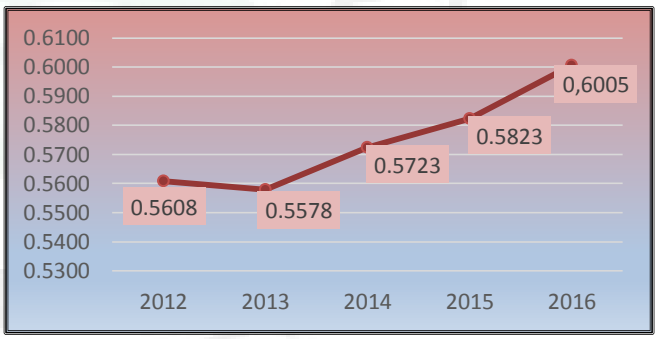


Fig I. Regional inequality in north sumatra 2012-2016

Based on the results of calculations with the Williamson index formula, it is known that the level of regional inequality in North Sumatra during the period of 2012 - 2016 tends to increase. Inequality had decreased in 2013, but again rose in 2014 and continued to increase until 2016.

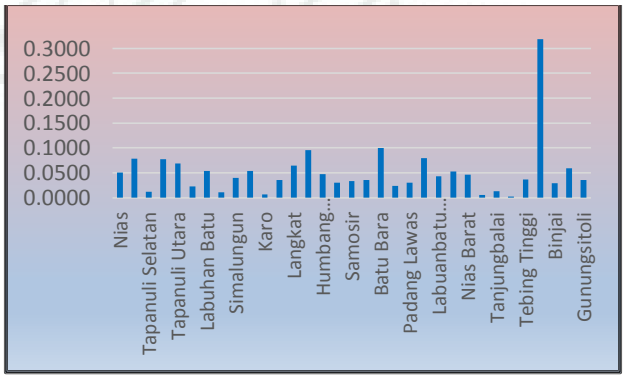


Fig II. Regional inequality in north sumatra by regency / city in 2016

In terms of the district / city, disparities in the highest region in 2016 occurred in the city of Medan with Williamson index value of 0.3186. Meanwhile, the lowest regional inequality occurred in Pematangsiantar City with the Williamson index value of 0.0029. In general, the results of the Williamson index calculation show that the level of regional inequality in North Sumatra is relatively low, with an average range of 0.0514.

B. Research purposes

The purpose of this study is to analyze the effect of the Human Development Index, Economic Growth, Number of Poor Population, Government Spending in Education and Government Spending in Health on Inequality Between Regencies / Cities in North Sumatra Province.

C. Literature Review

In regional economic development, Williamson (1965) stated that in the initial stages of development, regional disparities became greater and development was concentrated in certain regions. At a more advanced stage, seen from economic growth, it appears that the balance between regions has decreased significantly.

Myrdal (1957) states that excessive levels of economic progress between regions will cause adverse effects (backwash effects) to dominate the beneficial effects (spread effect) on regional growth, in this case resulting in an imbalance process. Actors who have power in the market normally will increase rather than decrease, resulting in regional disparities (Arsyad, 1999).

Measuring inequality between regions / regions using the Williamson index calculation. The Williamson Index, introduced by Williamson in his 1965 writing, is a method for measuring regional inequality. This method is obtained from per capita calculations and population in a country. Systematically the Williamson index calculation is as follows:

$$= \frac{\sqrt{\Sigma(Yi - Y)^2 fi/n}}{Y}$$

Where:

IW = Williamson index
Yi = GRDP per capita in regencies / cities i
Y = GRDP per capita in the Province
fi = Number of residents in the Regency / City i
n = Number of population in the Province

The magnitude of Williamson index is positive and ranges from zero to one. The greater the value of this index (close to number one) means the greater the level of income inequality between regions within the region. Conversely the smaller the value of this index (close to zero) means the more evenly distributed level of income distribution between regions in the region.

Oshima (1981) establishes criteria for knowing the level of income inequality between regions, whether there is a high, medium or low inequality. For this reason, the following criteria are determined:

- Inequality is high if IW > 0.5
- Moderate inequality if IW = 0.35 - 0.5
- Inequality is low if IW <0.35

D. The Human Development Index Theory

According to Maipita (2013) HDI (human development index) is a key dimension of human development. Measuring the average achievement of a country in the three basic dimensions of human development, namely longevity and health, access to knowledge and a decent standard of living.

In the human development index there are three composition indicators used to measure the size of a country's human development index, namely:

1. Health level is measured life expectancy at birth (infant mortality rate).
2. Education level is measured by literacy rates (with a weight of two-thirds) and average length of schooling (with a third weight).
3. The standard of living is measured by the level of expenditure per capita per year.

General formula used to calculate the Development Index

Humans mathematically according to Maipita (2013) are as follows:

$$HDI = \sqrt[3]{((I\_life)\ (I\_edu)\ (I\_income))}$$

Where:

I_life = life expectancy index

I_edu = education index

I_income = income index

E. Economic growth

Economic growth is the process of increasing gross national product or real national income. In other words, the economy develops if real output growth occurs. Meanwhile, according to Suryana (2000: 5) economic growth is defined as an increase in GDP (gross domestic product) regardless of the increase is greater or smaller than population growth that occurs, and regardless of whether there is a change in the structure of the economy or not.

F. Theory of Poverty

According to the statistical body, Poverty is the inability to meet minimum standards of basic needs which include both food and non-food needs. While the definition according to UNDP in Cahyat (2004) is the inability to broaden life choices, including by including an assessment of the absence of participation in public policy making as an indicator of poverty.

G. Government Expenditures

Government expenditure is a reflection of the policy that the government does, i.e. if the government sets a policy to buy goods and services, then government expenditure reflects the costs that must be incurred by the government in implementing the policy. (Mangkoesoebroto, 1994).

II. RESEARCH METHODOLOGY

The study was conducted at the North Sumatra Central Statistics Agency (BPS) office. The determination of this research area is based on considerations to make it easier for writers to collect the required data, as well as time, cost and effort can be saved as efficiently as possible. While the planned research time is approximately four months starting from January 2017 to April 2017.

The type of data used in this study is secondary data on the variable Human Development Index, economic growth, the percentage of poor population, government spending in education and government spending in health which is thought to influence the imbalance of income distribution in North Sumatra Province. The spatial scope of the study is all regencies/cities in North Sumatra Province, namely 33 regencies/cities, with a 5-year data series from 2012-2016 with a total of 165 panel data which is a combination of spatial data and time series that are quantitative data.

III. RESEARCH RESULTS AND ANALYSIS

Panel data is a combination of time series data and cross section data, where the cross section in this study is in the form of regional characteristics. By using a panel data regression model it is possible to capture characteristics between individuals and between different time.

Results of Estimation of the Panel Data Equation Model (Fixed Effect Model)

Dependent Variable: LOG(KETIMPANGAN?)

Method: Pooled EGLS (Cross-section weights)

Date: 05/08/18 Time: 08:24
Sample: 2012 2016
Included observations: 5
Cross-sections included: 33
Total pool (balanced) observations: 165
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.019766	1.603902	-3.753201	0.0003
LOG(IPM?)	-0.136285	0.250817	-0.543363	0.5878
LOG(PE?)	0.133270	0.072174	1.846527	0.0671
LOG(MISKIN?)	0.248193	0.108812	2.280928	0.0242
LOG(DP?)	-0.072496	0.018147	-3.994927	0.0001
LOG(DK?)	0.095356	0.026300	3.625657	0.0004
Fixed Effects (Cross)				
_1201--C	0.399074			
_1202--C	0.693240			
_1203--C	-0.981001			
_1204--C	0.683209			
_1205--C	0.770254			
_1206--C	-1.339397			
_1207--C	1.308187			
_1208--C	-0.089145			
_1209--C	-1.995098			
_1210--C	0.414181			
_1211--C	0.111731			
_1212--C	0.286035			
_1213--C	-0.409349			
_1214--C	0.930622			
_1215--C	0.321276			
_1216--C	0.378834			
_1217--C	0.023925			
_1218--C	-3.312600			
_1219--C	1.716977			
_1220--C	-2.877510			
_1221--C	-1.235299			
_1222--C	1.513840			
_1223--C	1.091945			
_1224--C	0.412078			
_1225--C	0.531824			
_1271--C	0.086087			
_1272--C	-1.096151			
_1273--C	0.320857			
_1274--C	-0.224092			
_1275--C	2.364968			
_1276--C	-1.222851			
_1277--C	0.661858			
_1278--C	-0.238508			

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.994223	Mean dependent var	-13.39043
Adjusted R-squared	0.992540	S.D. dependent var	8.527002
S.E. of regression	0.285223	Sum squared resid	10.33174
F-statistic	590.7184	Durbin-Watson stat	0.938393
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.940958	Mean dependent var	-3.605704
Sum squared resid	16.23616	Durbin-Watson stat	0.945321

Based on the results of data processing in Table 4.3 above, the general equation of this study can be written as follows:

LOG (INEQUALITY) = -6.01976552766 - 0.136284643102 LOG (IPM) + 0.133270407605 LOG (PE) + 0.248192881297 LOG (POOR) - 0.0724962035319 LOG (DP) + 0.0953558113714 LOG (DK).

The interpretation of the form of the equation above is if the independent variables of hdi, pe, poor, dp and dk are assumed to be zero, then the inequality of the province of north sumatra will decrease by 6.02%.

Output based on panel data regression estimation with equipment effect above then we can do analysis of statistic test as follows:

A. Partial Test (t-test)

From the results of the processing table using Eviews above, it can be seen that the independent variables, namely POOR (Number of Poor Population), DP (Education Expenditures), and DK (Health Expenditures) significantly influence the 5% significance level of the dependent variable. Inequality between regions) with probability respectively 0.0242, 0.0001, 0.0004. While the PE independent variable (Economic Growth) has a significant effect on the dependent variable INEQUALITY (Inequality between regions) at a significance level of 10% with a probability of 0.0671. For the dependent variable HDI (Human Development Index) does not significantly influence the dependent variable INEQUALITY (Inequality between regions) at either the 5% or 10% significance level, with a probability of 0.5878.

B. Overall (F-test)

From the table above it can be seen that the Prob (F-statistic) value is 0.0000, smaller than 5% which means that the independent variables of HDI, PE, POOR, DP and DK simultaneously have a very significant influence on changes in the dependent variable INEQUALITY.

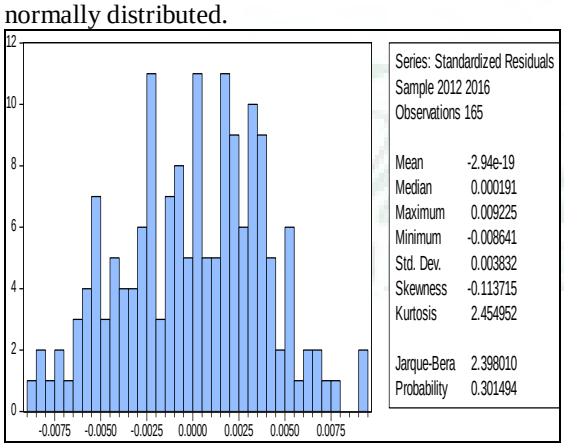
Coefficient Determinant (R2)

From table 4.7 the R2 value of 0.994223 is obtained, indicating that the variation of the change in the value of the non-dependent variable INEQUALITY can be explained simultaneously by the independent variables namely the variables IPM, PE, POOR, DP and DK by 99.42% while the rest is 0 , 58% is explained by other factors not included in the model.

C. Classic assumption test

1) *Normality Test*

To detect whether the regression equation above has a normal distribution of residuals or it cannot be seen from the Jarque-Bera Probability value. If the value of Jarque-Bera Probability> α = 5%, it can be said that the residuals are normally distributed. But if the value of Jarque-Bera Probability <α = 5%, it can be said that the residuals are not normally distributed.



From the processing results obtained Jarque-Bera Probabiliti value of 0.301494, which is greater than α = 5% which means that the residuals are normally distributed.

2) Heteroscedasticity Test

Dependent Variable: RESABS				
Method: Panel Least Squares				
Date: 01/08/19 Time: 11:27				
Sample: 2012 2016				
Periods included: 5				
Cross-sections included: 33				
Total panel (balanced) observations: 165				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(IPM)	-0.005398	0.001542	-3.500630	0.0006
LOG(PE)	0.002979	0.001744	1.708783	0.0894
LOG(MISKIN)	0.002121	0.000437	4.856076	0.0000
LOG(DP)	-0.002470	0.000679	-3.637414	0.0004
LOG(DK)	0.002527	0.000775	3.261572	0.0014
R-squared	0.200377	Mean dependent var		0.002271
Adjusted R-squared	0.180387	S.D. dependent var		0.003864
S.E. of regression	0.003499	Akaike info criterion		-8.443107
Sum squared resid	0.001958	Schwarz criterion		-8.348987
Log likelihood	701.5563	Hannan-Quinn criter.		-8.404901
Durbin-Watson stat	1.417335			

One of the tests used to detect the presence or absence of heteroscedasticity symptoms is to use the Glejser test, namely by using absolute residual values as the dependent variable. If the probability value <α = 5%, then heteroscedasticity is said. Conversely, if the probability value> α = 5%, it is said to have occurred heteroscedasticity. The results of processing with Eviews 8.1 software, it is found that all the coefficients of the independent variables are significant, it can be concluded that there is no violation of the assumption of heteroscedasticity.

Variabel	Relationship Found	Significant
Human Development Index (HDI)	Negatif (-)	Not significant
Economic growth (EG)	Positif (+)	Significant on α = 10%
Number of poor population (POOR)	Positif (+)	Significant on α = 5%
Education Expenditures (EE)	Negatif (-)	Significant on α = 5%
Health Sector Expenditures (DK)	Positif (+)	Significant on α = 5%

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3) Multicollinearity Test

The detection of multicollinearity can be done in various ways. One way is to calculate the value of VIF (Variance Inflation Factor) and TOL (Tolerance) where the formula is as follows:

VIF = dan TOL = 1 - R2

	VIF	TOL
LOG(PE) LOG(IPM)	1.00042	0.99958
LOG(MISKIN) LOG(IPM)	1.07964	0.92623
LOG(DP) LOG(IPM)	1.22381	0.81712
LOG(DK) LOG(IPM)	1.25390	0.79751
LOG(MISKIN) LOG(PE)	1.00251	0.99749
LOG(DP) LOG(PE)	1.00326	0.99675
LOG(DK), LOG(PE)	1.00041	0.99959
LOG(DP), LOG(MISKIN)	2.14016	0.46725
LOG(DK), LOG(MISKIN)	2.16107	0.46273
LOG(DK), LOG(DP)	3.83561	0.26071

The relationship that occurs between the independent variables to the dependent variables can be seen through the coefficient values of the independent variables

IV. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Based on the results of the analysis and discussion described in the previous chapters, a number of conclusions can be drawn as follows:

1. Human Development Index (HDI) has a negative and not significant effect on income inequality. This can be seen from the results of the regression test that produces a negative intercept value and a probability of = 0.5878> 0.05 which means there is a negative but not significant effect. Thus the hypothesis is proven.
2. Economic growth (PE) has a positive and significant effect on income inequality. This can be seen from the results of the regression test that produces positive intercept values and probability of = 0.0671 <0.10 which means there is a positive and significant effect. Thus the hypothesis is not proven.
3. The number of poor people has a positive and significant effect on income inequality. This can be seen from the results of the regression test that produces a positive intercept value and a probability of = 0.0242 <0.05 which means there is a positive and significant effect. Thus the hypothesis is proven
4. Government expenditure in education has a negative and significant effect on income inequality. This can be seen from the results of the regression test that produces a negative intercept value and a probability of = 0.0001 <0.05 which means there is a negative and significant effect. Thus the hypothesis is proven.
5. Government expenditure on health has a positive and significant effect on income inequality. This can be seen from the results of the regression test that produces a positive intercept value and a probability of = 0.0004 <0.05 which means there is a positive and significant effect. Thus the hypothesis is not proven.

V. RECOMMENDATIONS

From the process and results of this research, some suggestions that can be conveyed include:

1. Human Development Index is one tool to see the success of the development of an area in terms of improving the quality of its people. The increase in HDI value, although not directly able to reduce the level of income inequality, can be used as a basis to see the development of human quality development in the area
2. Development results reflected in high economic growth rates should be able to reduce the level of income inequality by equitable distribution of development results across regions and economic sectors so as to improve the welfare of the population. The regions that are the centers of economic growth should be able to have a beneficial effect on the surrounding area which includes the flow of investment activities in the growth center to the surrounding area, not only having a bad impact. Good economic growth can be done by maintaining macroeconomic stability, stabilizing prices, creating productive employment, maintaining the investment climate, maintaining trade regulations, increasing the productivity of the agricultural sector, and developing infrastructure in underdeveloped regions.

3. The increasing number of poor people will increase the level of income inequality, therefore appropriate measures are needed so that efforts to reduce the number of poor people can go as expected. By providing food assistance (rastra) and Non-Tunal Food Assistance (BPNT), Conditional Cash Assistance (Family Hope Program), and Health Indonesia Health Insurance Contribution Assistance for the poor and very poor. In addition, the strengthening of the economy needs to be realized through the ease of business licenses for beginners, the strengthening of micro and small businesses and the empowerment of cooperatives, as well as the improvement of labor expertise and expertise certification.

4. Government expenditure funds in education must be allocated on target so that they can function optimally in reducing income inequality in education so that people who are in need can benefit from the funds.

5. Management of government expenditure funds on the right target is expected to reduce income inequality. It is necessary to separate policies for certain groups of people to be prioritized to receive benefits from this health fund. The existence of cross subsidies between the well-off and the less well-off can be a consideration for the use of this health fund in the community. In addition, the government is technically expected to rebuild public health infrastructure by reactivating health facilities and infrastructure such as Poskesdes or Polindes.

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