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THE INFLUENCE OF HUMAN DEVELOPMENT INDEX ON THE INCOME DISTRIBUTION INEQUALITY IN YOGYAKARTA

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ABSTRACT

The purpose of this study is to analyze whether the Human Development Index is a key factor in encouraging the income distribution inequality in DIY Province. The method used in this research is to use Fixed Effect Model, using Chow test and Hausman test. The type of data used in the form of secondary data which is research data, which is a combination of time series data from 2010-2020 and cross section data from 5 regencies in DIY Province. The data in this study are quantitative in nature, namely data obtained from the Central Bureau of Statistics in the form of numbers, including: Gini Index, HDI, GRDP, and LGI. The results showed that based on the results of the R-Square of 0.5424 which means the income distribution inequality in 5 regencies/cities in DIY Province has a change of 54.24% which is influenced by the HDI, GRDP, and LGI variables. While the value of 45.76% is influenced by variables outside the study. Based on the partial test, it was found that the HDI and LGI have a positive and significant effect on the income distribution inequality, while GRDP has no significant effect on income distribution inequality in 5 regencies/cities in DIY Province.

Keywords: Human Development Index (HDI); Income distribution; Inequality; Locally-Generate Income.

INTRODUCTION

The development paradigm that prioritizes high economic growth is manifested in the Development Trilogy, namely by building regional growth centers, which has caused investment and resources to be absorbed and concentrated in urban areas as growth centers, while hinterland areas experience excessive resource depletion (massive backwash effect). This gap in the end causes problems in the macro context, which is very detrimental to the development process to be achieved as a nation. On the one hand, development imbalances between regions occur in the form of poor distribution and allocation of resource utilization which creates inefficiency and suboptimal economic systems. The imbalance in development results in the structure of relations between regions that form an interaction that weakens each other (Rachmawatie *et al*., 2010).

The definition of economic inequality is the difference in economic development horizontally and vertically between one region and another, causing uneven development (Aprilianti & Harkeni, 2021). Inequality occurs because of the concentration of basic sector economic activities in certain areas. The occurrence of inequality in the development of the industrial sector between regions is one of the factors causing regional economic inequality (Iswanto, 2015). Income inequality is a picture of the distribution of income in a country (Febriyani & Anis, 2021). Income distribution inequality between high and low income groups is a major problem in developing countries (Arif & Wicaksani, 2017).

The new paradigm of regional economic development was marked by the issuance of the Regional Autonomy Law number 22 of 1999 concerning regional government and replaced by Law number 32 of 2004, and replaced again with Law number 23 of 2014 which was previously centralized to decentralized. The problems of regional economic development are inequality in the development of the industrial sector, unequal distribution of investment, low level of mobility of production factors, differences in natural resources, demographic differences and lack of smooth trade between regions (Djadjuli, 2015).

The Gross Regional Domestic Product (GRDP) of The Special Region of Yogyakarta (DIY) based on business fields according to constant prices during the period 2010-2020 shows an increasing number of around 0.9 percent per year. This indicates that the economic performance of the DIY Province on a macro basis is very good, as shown in Table 1 below.

Table 1. Gross Regional Domestic Product (GRDP) of DIY Province, 2010 – 2020

Year	GRDP (Rupiah)
2010	64.678.968,20
2011	68.049.874,44
2012	71.702.449,18
2013	75.627.449,59
2014	79.536.081,75
2015	83.474.440,55
2016	87.687.926,63
2017	69.565.413,50
2018	72.391.519,00
2019	104.487.543,80
2020	101.679.600,20

Source: Central Bureau of Statistics, Special Region of Yogyakarta, 2021.

On the other hand, the condition of income distribution inequality in DIY Province during 2010-2020 shows moderate inequality. However, if you look more closely, the Gini Index value of DIY Province during 2010-2020 has increased, with an average Gini Index value of 0.35 per year (Table 1). This shows that the high GRDI owned by DIY is not evenly shared by all people of Yogyakarta. Or in other words, the high GRDI of DIY has not been able to represent the level of economic growth in DIY Province. This situation is also similar with the results of research on inequality in the province of East Java 2008 - 2012 that, there is no tradeoff between economic growth and inequality in the province of East Java. Because economic growth that continues to increase is also accompanied by inequality that continues to increase (Iswanto, 2015)

Income distribution inequality is a condition where the distribution of income received by the community is not evenly distributed. Inequality in the distribution of income shows that only a part of the community can enjoy the total income. Thus, the problem that needs to be overcome is to reduce the inequality of regional income distribution. Because this condition of inequality can affect the economic conditions of the region and affect the social conditions of the people in the region *(Rachmawatie et al*., 2010). The purpose of this study is to analyze whether the Human Development Index (HDI) influences the condition of income distribution inequality in DIY Province.

METHOD

This research was conducted using secondary data sourced from the Central Bureau of Statistics of Special Region of Yogyakarta Province. The data for this research include Human Development Index (HDI), Gross Regional Domestic Product (GRDP), and Regional Original Income (LGI) from 5 (five) regencies/cities in DIY

Province, from 2010 to 2020. Data were analyzed using panel data regression analysis techniques with fixed effect models (FEM). The dependent variable of this study is Income Distribution Inequality, and the independent variables are Human Development Index (HDI), Gross Regional Domestic Product (GRDP), and Locally-Generated Income (LGI). The panel data regression model with the fixed effects model (FEM) is formulated as follows:

$$Y_{it} = \alpha + \beta_1(HDI)_{it} + \beta_2(GRDP)_{it} + \beta_3(LGI)_{it} + e_t$$

Notice:

Y : Dependent variable (Income Distribution Inequality)
α : Constanta
$\beta_{1,2,3}$: Variable coefficient 1,2,3 is the number of variables
HDI : Human Development Index
GRDP : Gross Regional Domestic Product
LGI : Locally-Generated Income
i : Yogyakarta City; Bantul Regency; Sleman Regency, Kulonprogo Regency; Gunung Kidul Regency
t : Period of year 2010-2020

RESULT AND DISCUSSION

The Special Region of Yogyakarta is located in the south-central part of Java Island, geographically it is located at 8º 30' 7º 20' South Latitude, and 109º 40' - 111º 0' East Longitude. Physiographic units of Mount Merapi, physiographic units of the Sewu Mountains or the Thousand Mountains, physiographic units of the Kulon Progo Mountains, and physiographic units of Lowlands.

Figure 1. Map of the Special Region of Yogyakarta
Source: Agency of transportation, communication and information of Special Region of Yogyakarta (DIY), 2021.

Regency/city boundaries in Yogyakarta Province are as follows:

a) To the north: Yogyakarta City and Sleman Regency
b) To the east: Gunung Kidul Regency
c) South side: Indonesian Ocean
d) On the west: Kulon Progo Regency

DIY Province consists of four districts and one municipality, which is divided into 78 sub-districts and 438 villages/ward. The regency with the largest area is Gunung Kidul, and the next are Kulon Progo regency and Sleman regency. Then Bantul and finally the city of Yogyakarta as the capital of the province as well as the regency/city area with the smallest area.

Table 2. Special Region of Yogyakarta Gini Index, 2010-2020

Year	City of Yogyakarta	Bantul	Sleman	Kulon Progo	Gunung Kidul
2010	0,165	0,277	0,411	0,244	0,255
2011	0,194	0,337	0,271	0,337	0,301
2012	0,179	0,343	0,278	0,343	0,323
2013	0,146	0,318	0,253	0,324	0,303
2014	0,396	0,321	0,396	0,382	0,296
2015	0,446	0,376	0,446	0,367	0,319
2016	0,429	0,381	0,394	0,372	0,334
2017	0,457	0,392	0,453	0,375	0,325
2018	0,427	0,412	0,45	0,365	0,337
2019	0,423	0,394	0,47	0,361	0,337
2020	0,421	0,381	0,42	0,38	0,352

Source: Central Bureau of Statistics, Special Region of Yogyakarta, 2021.

Inequality in the distribution of income between regions in this study was obtained from the publication of each year's book. Income distribution inequality in Regency/City in DIY Province has increased every year and only Sleman Regency has decreased. The highest income inequality is obtained in the city of Yogyakarta every year with an index value of more than 0.35 or in other words inequality in the city of Yogyakarta is in the moderate category.

Table 3. Human Development Index Special Region of Yogyakarta 2010-2020

Year	City of Yogyakarta	Bantul	Sleman	Kulon Progo	Gunung Kidul
2010	82.72	75.31	79.69	68.83	64.20
2011	82.98	75.79	80.04	69.53	75.93
2012	83.29	76.13	80.10	69.74	65.69
2013	83.61	76.78	80.26	70.14	66.31
2014	83.78	77.11	80.73	70.68	67.03
2015	84.56	77.99	81.20	71.52	67.41
2016	85.32	78.42	82.15	72.38	67.82
2017	85.49	78.67	82.85	73.23	68.73
2018	86.11	79.45	83.42	73.76	69.24
2019	86.65	80.01	83,85	74.44	69.96
2020	86.61	80.01	83.84	74.46	69.98

Source: Central Bureau of Statistics, Special Region of Yogyakarta, 2021.

The quality of human development by regencies/cities in DIY during the 2010-2020 period shows an increasingly improving development. This can be seen from the achievement of the HDI values of all regencies/cities which are gradually increasing. At the level, the highest achievement of human development in the last decade was recorded in Yogyakarta City and followed by Sleman Regency. The next highest achievements are Bantul Regency and Kulon Progo Regency, respectively. Meanwhile, the achievement of the level of human development in Gunung Kidul Regency for the last few years has always been recorded at a low position among the five regencies/cities in DIY.

Model Statistical Selection Testing

1. Chow Test

This chow test is a test to determine the most appropriate Fixed Effect Model or Common Effect Model used in estimating panel data. The hypothesis in the Chow test is as follows:

H_0 : Common Effect Model or OLS

H_1 : Fixed Effect Model

The basis for rejecting the hypothesis above is to compare the calculation of the F-statistics with the F-table with of 5%. The comparison is used if the results of the F-statistics are smaller than the F-table, so that H0 is not rejected, which means that the model used is the Common Effect Model.

Table 4. Chow Test Results

Effects Test	Statistic	d.f.	Probability
Cross-section F	6.339066	(4,47)	0.0004

Source: Panel Data Processing Results, 2022.

From the Table 4, the probability value is obtained. 0.004 is smaller than the value of = 0.05, it can be concluded that H0 is rejected, so that a good model and the chosen model is the *Fixed Effect Model* (FEM).

2. Hausman Test

The Hausman test is a statistical test to choose whether the Fixed Effect Model or the Random Effect Model is the most appropriate to use. The hypotheses used are::

H_0 : Fixed Effect Model

H_1 : Random Effect Model

If the value of the Hausman test is less than 0.05 then H0 is accepted, meaning that the correct model to use is the Fixed Effect Model. However, if the results of the Hausman test are 0.05, the right model to use is the *Random Effect Model.*

Table 5. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Probability
Cross-section random	44.934432	3	0.0000

Source: Panel Data Processing Results, 2022.

From the Table 5, the Chi Square statistical test value from the above calculation is 44.934432 and the probability value is obtained. 0.0000 < (smaller) than = 0.05, it can be concluded that H0 is rejected, so that the good model chosen is the *Fixed Effect Model* (FEM).

Estimation of Regression Model with Fixed Effect

This Fixed Effect model already assumes differences between individuals that are usually accommodated from differences in intercepts. This model uses the Dummy Variable Technique to capture the different interpretations.

Table 6. The Results of Fixed Effect Model

Dependent Variables: Income distribution inequality (Gini Index)	Model Fixed Effect Model
C	-7.163016
HDI	0.028348
LOG(GRDP)	0.162210
LOG(LGI)	0.060539

Source: Panel Data Processing Results, 2022.

From the estimation results in Table 6, a panel data analysis model can be made on the income distribution inequality in DIY Province, where obtained the following results:

$$\hat{Y}_{it} = -7.163016 + 0.028348\ (HDI)_{it} + 0.162210(GRDP)_{it} + 0.060539\ (LGI)_{it}$$

Constant value (α) = -7.163016 it can be interpreted that if all the independent variables (HDI, GRDP, and LGI) considered constant or unchanged, the income distribution inequality is 7,1%. β_1 = 0.028348 can be interpreted that when the Human Development Index (HDI) increases by 1%, the inequality rate will decrease by 0.028%. β_2 = 0.162210 it can be interpreted that when the Gross Regional Domestic Product (GRDP) increases by 1%, the inequality rate will decrease by 0.162%. β_3 = 0.060539 it can be interpreted that when Locally-Generated Income (LGI) increases by 1%, the inequality rate decreases by 0.060%.

In the estimation model above, there is an effect of different cross sections in each regency/city on the income distribution inequality in the DIY Province. Regencies that have a positive cross section effect are Bantul regencies of 0.056358, Sleman regencies of 0.0261009, Kulon Progo regencies of 0.256372, Gunung Kidul regencies of -0.083127 and Yogyakarta city of -0.490612.

RESULT AND DISCUSSION

Simultaneous Test (F-Statistics)

Simultaneous test (F-statistics) aims to find out how much influence the coefficient of the regression results together on the dependent variable and the results of the F-test as follows:

Table 7. Overall Results

Regression of Fixed Effect Model (FEM)	
Prob>F	0.000
Error Corelated	0.208
R-Square	0.542
F-Statistik	7.958
Adj R-Square	0.474

Source: Panel Data Processing Results, 2022.

If seen in the table above, the value of the F-Statistic is 7.958 and the probability value of the F-Statistic is 0.000, it can be concluded that the value of Prob>F is smaller than = 0.05, so it can be said that the independent variables together have an influence on the variables dependent.

Determinant Coefficient (R^2)

The determinant coefficient (R^2) is something that displays how much the dependent variable can be explained by the independent variable. As a measure of the ability of the model to know statistically.

Based on the results of the R-Square of 0.542, which means that the income distribution inequality in 5 regencies/cities in DIY Province has a change of 54.24% which is influenced by the HDI, GRDP, and LGI variable. While the value of 45.76% is influenced by variables outside the study.

Partial Test (t-Statistics)

The statistical test aims to determine the relationship of each independent variable consisting of HDI, GRDP, LGI to Income Distribution Inequality by using the Gini Index as the Dependent Variable. This t-statistic test can be known by looking at the regression coefficient and probability values for each independent variable with a standard probability of < 5%. The following are the results of the t-statistical test:

Table 8. Panel Data Regression Test Results

Dependent Variable: Income Distribution Inequality (Gini Index)	Coefficient	t-Statistic	Probability
HDI	0.028	2.546877	0.014
LOG(GRDP)	0.162	1.468245	0.148
LOG(LGI)	0.060	2.774210	0.007

Source: Panel Data Processing Results, 2022.

The Effect of Human Development Index (HDI), Gross Regional Domestic Product (GRDP), Locally-Generate Income (LGI) on Income Distribution Inequality

The HDI variable has a significant effect on income distribution inequality in 5 regencies/cities in DIY Province, based on the analysis results obtained. The coefficient value of the HDI variable on income distribution inequality is 0.028348 and the t-count or t-statistic is 2.546877 with a probability value of 0.0142 (less than 0.05). The HDI regression coefficient which is positive and the probability is smaller than the standard probability means that the HDI variable partially has a positive and significant effect on the income distribution inequality in the Regency/City of DIY Province. This means that if the human development index has an increase of 1%, the amount of inequality will increase by 0.028% in 5 regencies/cities in DIY Province. This is consistent with research Aprilianti & Harkeni (2021) which found that the human development index has a positive and significant effect on economic inequality.

This is also in accordance with the results of research in Java in the 2007-2015 period which showed that the human development index had a positive and significant influence on income inequality (Arif & Wicaksani, 2017; Narindra & Jati, 2016; Avriandaru, 2018; Kusuma *et al*., 2019; Tyass *et al*., 2023). Astuti (2015) explains that one of the instruments of the HDI is life expectancy, life expectancy in East Java province is quite high so that it can form and create a productive workforce and in the end will increase the income per capita of the community, but this is only found in the centers of economic activity so that growth is uneven and triggers economic inequality. This widens the income distribution gap between the rich and the poor.

The human development index is specifically a measure in achieving human economic development by using several basic components of quality of life. HDI is calculated based on data that can describe four components, namely the achievement of a long and healthy life that represents the health sector, literacy rates, school participation and their average length of schooling, measuring development performance in the education sector, and the purchasing power of the community towards a number of basic needs that are needed. Seen from the average amount of per capita expenditure as an income approach. With the increase in HDI, it is expected to reduce the widening development gap between regions (Kusuma *et al*., 2019). The occurrence of inequality between regions will have an impact on the level of community welfare between regions (Fitriyah & Rachmawati, 2013). The relationship of income inequality has a significant effect on people's welfare (Febriani & Yusnida, 2020). Other

literature also shows a positive and significant influence on people's welfare (Fitriyah & Rachmawati, 2013). The regency/city government is said to be successful in the development process if the level of regional inequality is small or more evenly distributed by increasing the welfare of the community evenly and vice versa.

Meanwhile, GRDP variable was found to no significantly affect the income distribution inequality. Based on the results of the analysis obtained with the GRDP variable coefficient of 0.162210 and t-count or t-statistic of 1.468245 with a probability value of 0.1487 (greater than 0.05). The GRDP regression coefficient which is positive and the probability is greater than the standard probability means that the GRDP variable partially has a positive and insignificant effect on the income distribution inequality in the Regency/City of DIY Province. The other hand, the LGI variable actually has a positive and significant effect on income distribution inequality. This is evidenced by the t-statistic of 2.774210 and a probability value of 0.007. The LGI variable has a positive and significant effect on income distribution inequality indicating that the increase in LGI every year in regencies/cities in DIY Province is accompanied by the level of inequality that occurs between regencies/cities. LGI's role in reducing inequality is considered inadequate because more is allocated for routine spending (Suardhika & Putri, 2014). Rachmawatie (2021) states that increased locally-generate income can be optimized by increasing spending, especially for development spending that is investment in nature so that it will be beneficial in the future.

CONCLUSION

Human development index (HDI) has a significant effect on the inequality of income distribution in regencies/cities in the DIY Province for the 2010-2020 period. However, an increase in the HDI can also increase the income distribution inequality between regions in the DIY Province. Inequality in the distribution of income between regions can be caused by similar access to services but in terms of different quality in regencies/cities in DIY Province, so this also has an impact on the quality of human resources produced. When quality cannot be achieved by everyone, the chances of getting a job will be different because there is an imbalance of knowledge and quality which in the end there is still an imbalance in the distribution of income in a regency/city in the DIY Province.

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