The Asian Journal of Professional and Business Studies

EFFECT OF INVESTMENT, UNEMPLOYMENT AND HUMAN DEVELOPMENT INDEX AGAINST INCOME INEQUALITY (COMPARATIVE STUDY OF JAVA ISLAND, SUMATRA AND SULAWESI ISLAND)

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ABSTRACT

This study aims to analyze the effect of Investment, Unemployment and Human Development Index on Income Inequality (Comparative Study of Sumatra, Java and Sulawesi Islands). The data used is panel data (time series & cross section) from 2010 to 2023 consisting of every province on the island of Sumatra, Java and Sulawesi. Data is sourced from the Central Bureau of Statistics (BPS) and the Investment Coordinating Board, Ministry of Investment of the Republic of Indonesia. The data was analyzed by path analysis method (Sobel Test) using Eviews12 software. The results of the analysis show that partially Investment and Human Development Index have a significant direct influence on Income Inequality through GRDP in Sulawesi Island, while Unemployment indirectly has no significant effect. In contrast to Sumatra and Java, both show that Investment, Unemployment and Human Development Index do not have a significant indirect effect on Income Inequality through GRDP. However, simultaneously all these independent variables have a significant direct influence on income inequality in Sumatra, Java and Sulawesi Island.

1.0 INTRODUCTION

Arsyad in (Idris, 2014) states that the benchmark for development success can be seen from economic growth, economic structure, and the smaller income inequality between residents, between regions and between sectors. And good economic growth also becomes meaningless if it is not accompanied by a reduction in inequality in income distribution. Income inequality refers to the difference in income between more developed communities or regions and less developed regions.

Income inequality remains a hot topic, especially one that has caused concern following the Great Recession. This is in line with the results of a review relating to world inequality from the Economist magazine (August 2022) which shows that development inequality will worsen again until 2022. This could be an accumulation of the Covid-19 pandemic (Elfindri, 2023). This is in line with Junaedi and Salistia's (2020) research, namely that the Covid-19 pandemic has had a multi-sector impact on economic growth in Asia, America and Africa relatively more heavily than in other regions.

One way to measure inequality is to use the Gini Index (Gini Coefficient) or also known as the Gini Ratio. The Gini ratio is an indicator to describe inequality or inequality with a value in the range 0-1. If the number is closer to 0, there will be perfect equality of income, whereas if the value is closer to 1, there will be perfect inequality (Dwiputra, 2018).

This research highlights the differences in income inequality on the islands of Sumatra, Java and Sulawesi. In general, the Gini index value on the island of Java is in the moderate inequality category, with the average Gini index value in the range of 0,4-0,5. Even though it is included in the medium category, the Gini index for Java Island is higher compared to Sulawesi Island and Sumatra Island. And it can be seen that during the Covid-19 pandemic that hit Indonesia in the period 2019 to 2022, the Gini index for Sumatra Island and the Gini index for Sulawesi Island tended to experience a decline of -0,55% and -0,78%, while for Java Island continuously increasing by 1,29%. So, regional income inequality on the island of Java still needs to be reduced in order to improve the standard of living of its people so that it is better evenly.

Increasing inequality in income distribution can also be caused by rapid economic growth, if population growth and changes in economic structure are not taken into account. In the regional government system, the measure of economic growth is the continuous increase in GRDP (Gross Regional Domestic Product). Based On a Constant Price Basis Gross Regional Domestic Product (GRDP) data processed from the Central Statistics Agency, Sulawesi Island's economic growth from 2010 to 2023 is likely to experience an average increase of 6,39%. Meanwhile, the average economic growth on the islands of Sumatra and Java is smaller, namely 3,84% and 4,51%. The impact of the recession was felt at the start of the Covid-19 pandemic in 2019. However, economic growth recovered from 2020 to 2023.

Jhingan (2014) in (Harten, 2022) explains that there are many factors that cause back impacts in a region, where one of the factors that causes inequality in a region is investment. This is confirmed by Myrdal's opinion in Islami and Nugroho (2018) which states that investment will cause inequality. Based on data from the National Single Window for Investment (NSWi), Ministry of Investment (BKPM), it appears that investment in Java, Sumatra and Sulawesi tends to increase starting from investments worth billions in 2010 to 2023. Even though Java has an investment value The highest in 2023 is worth 364.305.751,80 billion rupiah compared to Sumatra Island and Sulawesi Island worth 95.265.058,33 and 126.214.779,18 billion rupiah, but the average growth is not the same. Sulawesi Island has the highest average investment value from 2010 to 2023, namely 22%, followed by Sumatra Island at 21%, while Java Island is only worth 9%.

In fact, during the Covid-19 pandemic, it did not reduce the interest of domestic and foreign investors to invest in Indonesia. Among Java, Sumatra and Sulawesi, only Java Island investment fell -10% in 2020 before increasing again sharply by 84% in 2023. Meanwhile, Sumatra Island and Sulawesi Island continued to rise until 2023. However, even though investment tends to increase, ontologically during the Covid-19 pandemic, many businesses such as shopping centers laid off their employees, thereby increasing the number of unemployed.

The Open Unemployment Rate from 2010 to 2023 fluctuates. On average, the decline in the unemployment rate was best on the island of Sulawesi at -3,43%, while for Java Island it was -2,64% and Sumatra Island was -2,02%. Even though the Open Unemployment rate has been fluctuating and decreasing in the last 3 (three) years, the welfare of society in the fields of health, education and the economy should not be disturbed, resulting in a low Human Development Index (HDI). This is in line with research by (Hariani, 2019) that differences in open unemployment rates, poverty rates and the Human Development Index (HDI) will give rise to income inequality problems.

The HDI on each island continues to increase even though it looks small in 2023 due to the effects of the Covid-19 pandemic which has been going on since 2019. If categorized from 2010, the HDI of Java, Sumatra and Sulawesi is classified as medium HDI. In 2011, the island of Java was classified as a high HDI with a value of 70,08 and will continue to increase

until 2023 with a value of 77,12. Meanwhile, Sumatra Island was classified as high HDI in 2016 and followed by Sulawesi Island in 2020.

If studied theoretically, a decreasing unemployment rate should have a positive effect on income inequality and an increase in investment, HDI and GRDP will simultaneously have a negative effect on the Gini Index, which means it can reduce income inequality. However, this is contrary to existing data, which shows that 1 out of 3 Gini indexes for islands in Indonesia (Java) from 2019-2023 experienced an increase even though investment, HDI and GRDP increased (positive influence) and the unemployment rate decreased (Negative effect). This becomes logical if partially the existing investment is not evenly distributed and the very rapid rate of economic growth is not accompanied by equal distribution of income, which may be one of the factors that differentiates the Gini Index from the three islands in Indonesia. So, further research is needed to confirm the two phenomena that exist, in order to see the level of influence both directly and indirectly between the independent variables and intervening variables on the dependent variable.

Referring to the main issue raised above, this research aims: first, compare and analyze the influence of Investment, Unemployment and the Human Development Index on Income Inequality through GRDP on Sumatra Island. Second, comparing and analyzing the influence of Investment, Unemployment and the Human Development Index on Income Inequality through GRDP on the Island of Java. Third, Comparing and analyzing the influence of Investment, Unemployment and the Human Development Index on Income Inequality through GRDP on Sulawesi Island.

2.0 LITERATURE REVIEW

Concept of Regional Income Inequality

The theory of inequality in income distribution can be said to have started with the emergence of an "inverted U" hypothesis, namely longitudinal (time series) changes in income distribution which was put forward by Simon Kuznet in 1995. income will become more unequal, but after reaching a certain level of development, the distribution will become more equal. This is what Kuznet (1955) stated, that initially when development begins, income distribution will occur. Then it becomes more unequal, but after reaching a certain level of development, the distribution of income will become more equal.

Gini Index

The Gini Index is a measure of equity that is calculated by comparing the area between diagonals, the Lorenz curve divided by the area of the triangle on the bottom diagonal. The Gini index is between zero and one. If the Gini index value is close to zero, it indicates low inequality, whereas if the Gini index value is close to one, it indicates high inequality (Todaro, 2006).

Gross Regional Domestic Product

According to BPS, Gross Regional Domestic Product is the total added value produced by all business units in a region, including both final goods and services produced by all economic units in the region. GRDP can be divided into two types, namely GRDP based on current prices and GRDP based on constant prices. GRDP at current prices reflects the added value of overall production measured based on prices in effect in that year. On the other hand, GRDP calculated based on constant prices is used to identify actual economic growth in each time period.

Economic Growth Theory

Economic growth is the process of increasing output per capita in the long term. Note the emphasis on three aspects, namely process, output per capita and long term. Economic growth is a process, not a picture of the economy at one time (Mankiw, 2016).

Investment Theory

Dornbusch in Tu & Feng (2009) argues that investment is the demand for goods and services to create or increase production capacity or income in the future. In the Harrod-Domar Investment theory (Arsyad, 1997), capital formation/investment is

an important factor that determines economic growth. This capital formation can be obtained through the accumulation of savings. According to Harrod-Domar, capital formation is not only seen as expenditure that will increase an economy's ability to produce goods and services, but will also increase society's effective demand.

Unemployment Theory

Mantra Ida Bagoes (2003), believes that unemployment is the part of the workforce who is unemployed and is actively looking for work. This concept is often interpreted as a state of open unemployment. If the increase in the number of labor forces in an area is not balanced by an increase in employment, then the unemployment rate in that area will be high. On the other hand, if the increase in the number of the workforce is balanced with an increase in employment, then the unemployment rate will be low.

Human Development Index (HDI) Theory

The Human Development Index was introduced by the United Nations Development Program (UNDP) in 1990 and is published periodically in the HDR (Human Development Report) report (Central Statistics Agency, 2022). The Human Development Index is a benchmark used to see the quality of society in each region. HDI has three elements, namely health, education attained, and standard of living or often called the economy. These three elements are very important in determining the level of regional capability in increasing HDI (Central Statistics Agency, 2021).

3.0 METHODOLOGY

This research is a comparative study that uses secondary data in the form of panel data or combined data from time series during the 2010-2022 period and data across the islands of Java, Sumatra and Sulawesi in Indonesia. The data used in this research are Investment Data for 2010-2023 in Rupiah units, Unemployment Data for 2010-2023 in Percent units, Human Development Index (HDI) Data for 2010-2023 in Index units, Gross Regional Domestic Product Data for 2010-2023 in Rupiah units, and Regional Income Inequality data for 2010-2023 in Percent units.

Analysis Method

Path Analysis

According to Robert D. Retherford in (Sarwono, 2022a), Path Analysis is a technique for analyzing cause and effect relationships that occur in multiple regression if the independent variable influences the dependent variable not only directly but also indirectly. This path analysis follows a structural pattern or is called a structural model. The variables of this research are Investment (X_1), Unemployment (X_2) and Human Development Index (X_3) as independent variables, Regional Income Inequality (Y) as the dependent variable and GDP (Z) as the intervening variable. Meanwhile, other variables that are not measured or researched and influence Regional Income Inequality and GRDP are referred to as epsilon variables (ε) (Ghozali, 2015).

Structure I
The structural relationship between variables to analyze the influence of Investment, Unemployment and the Human Development Index on GRDP between islands in Indonesia can be explained in the picture below:
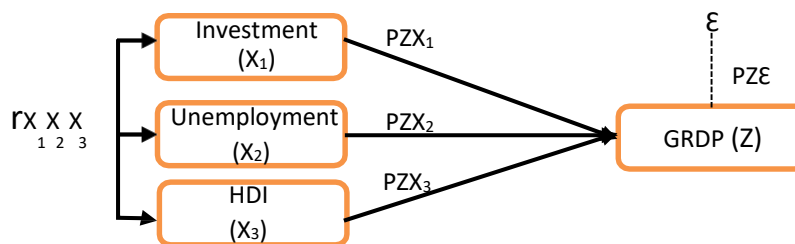

Figure 1 Structure I Path Analysis of the Relationship between X_1, X_2 and X_3 to Z

Information:
X_1 : Investment
X_2 : Unemployment
X_3 : Human Development Index
 Z   : GRDP

PZX$_1$, PZX$_2$ and PZX$_3$ are path coefficients and rX$_1$X$_2$X$_3$ is the correlation coefficient so that the structural equation of the path diagram above is expressed as:

$$PZ = PZX_1 + PZX_2 + PZX_3 + \varepsilon$$

Structure II

The structural relationship between variables to analyze the influence of Investment, Unemployment and the Human Development Index on Income Inequality between islands in Indonesia can be explained in the picture below:

Figure 2 Structure II Path Analysis of the Relationship between X_1, X_2 and X_3 to Y

Information:
X_1 : Investment
X_2 : Unemployment
X_3 : Human Development Index
 Z   : GRDP
 Y   : Regional Income Inequality

PYX$_1$, PYX$_2$ and PYX$_3$ are path coefficients and rX$_1$X$_2$X$_3$ is the correlation coefficient so that the structural equation of the path diagram above is expressed as:

$$PY = PYX_1 + PYX_2 + PYX_3 + PYZ + \varepsilon$$

Combined Structure (Path Analysis)

Structure III is used to see the overall pattern, both direct and indirect relationships between independent variables, intervening variables and dependent variables. The following is a picture of Structure III in question:
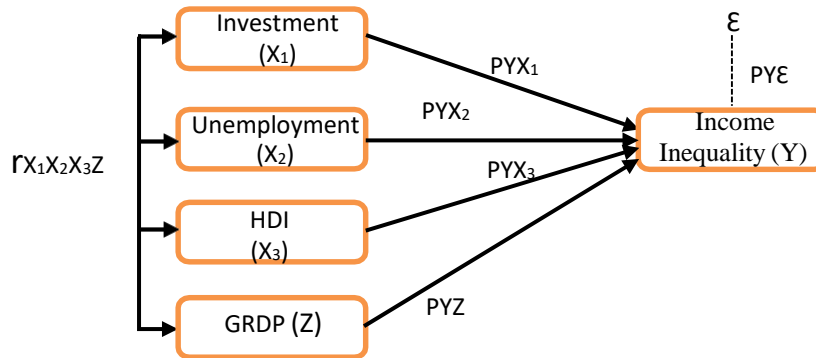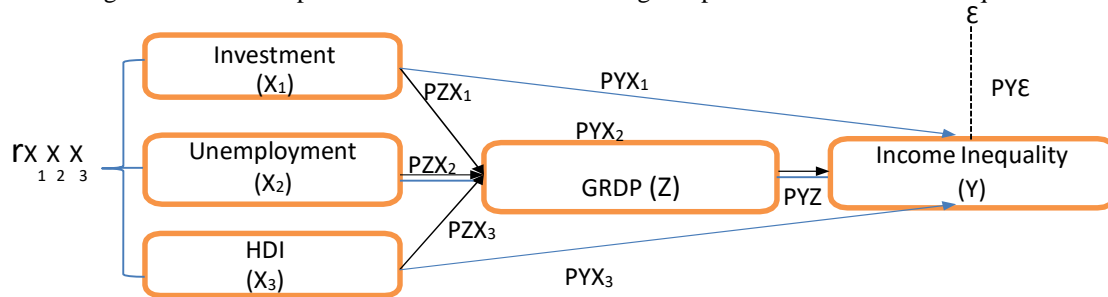

Figure 3 Structure III Path Analysis of the Relationship between X1, X2 and X3 to Y through Z

Information:
X_1 : Investment
X_2 : Unemployment
X_3 : Human Development Index
Z   : GRDP
Y   : Regional Income Inequality

PZX_1 and PZX_2 and PZX_3 are path coefficients and $rX_1X_2X_3$ is the correlation coefficient so that the structural equation of the path diagram above is expressed as:

$$PYZ = PZX_1PYZ + PZX_2PYZ + PZX_3PYZ + PY + \varepsilon$$

Hypothesis Testing

F-Statistics Test
Test criteria:
- F count < F table, then H_0 is accepted, meaning that together the independent variables are not significantly influenced by the dependent variable.
- F count > F table, then H_0 is accepted which means that together the independent variables significantly influence the influence of the dependent variable.

The calculated F count is found in the following way (Gujarati, 2006):

$$F\ \mathbf{count} = \frac{R^2/(k-1)}{(1-R^2)/(N-k)}$$

Where:
R^2 = Coefficient of determination
k   = Number of independent variables
N   = Number of observations

T-Statistics Test

If the calculated t count > t table or if the probability value t < a = 0,05 then reject H_0, so that the conclusion is that the independent variable partially has a significant effect on the dependent variable.

$$t \text{ count} = \beta i / (SE(\beta i))$$

Where:
βi   = Regression coefficient value
SE   = Standard Error Value of bi

Coefficient of Determination (R^2)

This coefficient of determination measures how far the model is able to explain the dependent variable. This coefficient is between zero (0) and one (1). The greater the coefficient value, the more capable the independent variable is of explaining the dependent variable. To calculate the magnitude of the determinant (R^2) the following formula can be used (Gujarati, 2006):

$$R^2 = ESS/TSS = 1 - (R^2/(k-1))/((1-R^2 (/(n-k))$$

Where:
R^2 = Coefficient of determination
ESS   = Residual sum of squares
TSS   = Total sum of remaining squares
N   = Number of observations
k   = Number of parameters (including intercept)

Sobel Test

The Sobel test is a test to determine whether the relationship through a mediating variable is significantly capable of acting as a mediator in the relationship. Where the Sobel Test uses the Z Test with the following formula:

$$Z = ab/(\sqrt{((b^2 SE 2|a)) + ((a^2 SE 2|b))}$$

Where:
α   = Regression coefficient of the independent variable on the mediating variable
b   = Regression coefficient of the mediating variable on the independent variable
SEα   = Standard error of estimation of the influence of the independent variable on the mediating variable
SEb   = Standard error of estimation of the influence of the mediating variable on the independent variable

4.0 FINDINGS AND DISCUSSION

This research was conducted to find out how big the influence of Investment, Unemployment, Human Development Index is on Income Inequality through economic growth (GRDP ADHK) on the islands of Sumatra, Java and Sulawesi. The following will explain the results of direct and indirect influence testing:

Results of Direct Influence Testing

Based on the test results, the results of the direct influence of regional income variables and regional expenditure variables are presented in Table 1.

Table 1 Direct Effect Test Results

Sumatra Variable			Coefficient	Std. Error	t-Statistic	Prob.	Information
INV	→	PE	0,001927	0,000414	-8,549498	0,0000	H_{1a}
INV	→	GR	0,000000000101	3,17E-10	0,319442	0,7499	H_{1b}
TPT	→	PE	-2713,997	1969,134	-1,378269	0,1705	H_{1c}
TPT	→	GR	-0,003170	0,001386	-2,288071	0,0237	H_{1d}
IPM	→	PE	11427,32	947,3354	12,06259	0,0000	H_{1e}
IPM	→	GR	-0,005637	0,000825	-6,834946	0,0000	H_{1f}
PE	→	GR	0,0000000206	4,39E-08	0,468888	0,6399	H_{1g}
Java Variables			**Coefficient**	**Std, Error**	**t-Statistic**	**Prob,**	**Information**
INV	→	PE	0,000679	0,000909	0,746432	0,4576	H_{2a}
INV	→	GR	0,0000000000772	1,49E-10	0,519402	0,6050	H_{2b}
TPT	→	PE	-890,7621	10086,94	-0,088308	0,9299	H_{2c}
TPT	→	GR	0,000970	0,001645	0,589875	0,5571	H_{2d}
IPM	→	PE	74577,80	74577,80	6732,723	0,0000	H_{2e}
IPM	→	GR	-0,000125	0,001806	-0,068997	0,9452	H_{2f}
PE	→	GR	0,0000000122	1,87E-08	0,650382	0,5175	H_{1g}
Sulawesi Variables			**Coefficient**	**Std, Error**	**t-Statistic**	**Prob,**	**Information**
INV	→	PE	0,000592	0,000177	3,345001	0,0013	H_{3a}
INV	→	GR	-0,000000000311	1,28E-10	-2,433809	0,0172	H_{3b}
TPT	→	PE	-4532,729	2987,642	-1,517159	0,1332	H_{3c}
TPT	→	GR	-0,002460	0,002003	-1,228135	0,2230	H_{3d}
IPM	→	PE	7984,960	1297,037	6,156310	0,0000	H_{3e}
IPM	→	GR	-0,001855	0,001057	-1,755586	0,0830	H_{3f}
PE	→	GR	-0,000000238	7,34E-08	-3,239774	0,0018	H_{1g}

Source: EViews 12 output

From the results of Table 1 above, it shows that:

Direct Effect of Investment on GRDP:
1. The direct effect of investment (X_1) on GRDP (Z) on Sumatra Island is 0,001927.
2. The direct effect of investment (X_1) on GRDP (Z) on Java Island is 0,000679.
3. The direct effect of investment (X_1) on GRDP (Z) on Sulawesi Island is 0,000592.

Direct Effect of Unemployment on Economic Growth:
1. The direct effect of Unemployment (X_2) on GRDP (Z) on Sumatra Island is -2713,997.
2. The direct effect of Unemployment (X_2) on GRDP (Z) on Java Island is -890,7621.
3. The direct effect of Unemployment (X_2) on GRDP (Z) on Sulawesi Island is -4532,729.

Direct Influence of the Human Development Index on GRDP:
1. The direct influence of HDI (X_3) on GRDP (Z) on Sumatra Island is 11427,32.
2. The direct influence of HDI (X_3) on GRDP (Z) on Java Island is 74577,80.
3. The direct influence of HDI (X_3) on GRDP (Z) on Sulawesi Island is 7984,960.

Direct Effect of Investment on Income Inequality:
1. The direct effect of investment (X_1) on income inequality (Y) on Sumatra Island is 0,000000000101.
2. The direct effect of investment (X_1) on income inequality (Y) on Java Island is 0,0000000000772.
3. The direct effect of Investment (X_1) on Income Inequality (Y) on Sulawesi Island is -0,000000000311.

Direct Effect of Unemployment on Income Inequality:
1. The direct effect of Unemployment (X_2) on Income Inequality (Y) on Sumatra Island is -0,003170.
2. The direct effect of Unemployment (X_2) on Income Inequality (Y) on Java Island is 0,000970.
3. The direct effect of Unemployment (X_2) on Income Inequality (Y) on Sulawesi Island is -0,002460.

Direct Influence of the Human Development Index on Income Inequality:
1. The direct effect of HDI (X_3) on Income Inequality (Y) on Sumatra Island is -0,005637.
2. The direct effect of HDI (X_3) on Income Inequality (Y) on Java Island is -0,000125.
3. The direct effect of HDI (X_3) on Income Inequality (Y) on Sulawesi Island is -0,001855.

Direct Influence of Human Growth on Income Inequality:
1. The direct effect of GRDP (Z) on Income Inequality (Y) on Sumatra Island is 0,0000000206.
2. The direct effect of GRDP (Z) on Income Inequality (Y) on Java Island is 0,0000000122.
3. The direct effect of GRDP (Z) on Income Inequality (Y) on Sulawesi Island is -0,000000238.

Indirect Effect Test Results

Apart from looking at the direct influence, this research also looks at the indirect influence of investment, unemployment and HDI on income inequality through GRDP. The results of the estimated indirect effect in question can be seen in Table 2.

Table 2 Indirect Effect Test Results

Sumatra Variable	Mediator	Indirect Influence (ρa X ρb)	P-Value (Total Influence)	Information
INV → GR	PE	0,0000000000397	0,000000000141	H_{1h}
TPT → GR	PE	-0,0000559	-0,00323	H_{1i}
IPM → GR	PE	0,000235	-0,00540	H_{1j}
Java Variables	**Mediator**	**Indirect Influence (ρa X ρb)**	**P-Value (Total Influence)**	**Information**
INV → GR	PE	0,00000000000828	0,0000000000855	H_{2h}
TPT → GR	PE	-0,0000109	0,000959	H_{2i}
IPM → GR	PE	0,000910	0,000785	H_{2j}
Sulawesi Variables	**Mediator**	**Indirect Influence (ρa X ρb)**	**P-Value (Total Influence)**	**Information**
INV → GR	PE	-0,000000000141	-0,000000000452	H_{3h}
TPT → GR	PE	0,00108	-0,00138	H_{3i}
IPM → GR	PE	-0,00190	-0,00376	H_{3j}

Source: Sobel Test Calculator (https://quantpsy,org/sobel/sobel,htm)

Based on Table 2 above, the results of testing the indirect influence of investment, unemployment, HDI on income inequality through GRDP on each island can be detailed as follows:

Effect of Investment on Income Inequality through GRDP:
a. The indirect effect of Investment (X_1) on Income Inequality (Y) through GRDP (Z) on Sumatra Island is 0,0000000000397, while the total effect is worth 0,000000000141.
b. The indirect effect of Unemployment (X_2) on Income Inequality (Y) through GRDP (Z) on Java Island is -0,0000559, while the total effect is -0,00323.
c. The indirect effect of HDI (X_3) on Income Inequality (Y) through GRDP (Z) on Sulawesi Island is worth 0,000235, while the total effect is -0,00540.

Effect of Unemployment on Income Inequality through GRDP:
a. The indirect effect of Investment (X_1) on Income Inequality (Y) through GRDP (Z) on Sumatra Island is 0,00000000000828, while the total effect is worth 0,0000000000855.
b. The indirect effect of Unemployment (X_2) on Income Inequality (Y) through GRDP (Z) on Java Island is -0,0000109, while the total effect is 0,000959.
c. The indirect effect of HDI (X_3) on Income Inequality (Y) through GRDP (Z) on Sulawesi Island is 0,000910, while the total effect is worth 0,000785.

Effect of the Human Development Index on Income Inequality through GRDP:
a. The indirect effect of Investment (X_1) on Income Inequality (Y) through GRDP (Z) on Sumatra Island is -0,000000000141, while the total effect is -0,000000000452.
b. The indirect effect of Unemployment (X_2) on Income Inequality (Y) through GRDP (Z) on Java Island is 0,00108, while the total effect is -0,00138.
c. The indirect effect of HDI (X_3) on Income Inequality (Y) through GRDP (Z) on Sulawesi Island is -0,00190, while the total effect is -0,00376.

Hypothesis Testing

F-Statistics Test Results

Table 3 F Test Results on the Islands of Sumatra, Java and Sulawesi

	Sumatera island		Java Island		Sulawesi island	
	Sub Structure I	Sub Structure II	Sub Structure I	Sub Structure II	Sub Structure I	Sub Structure II
F Count	528,8382	18,41969	74,99017	15,54219	41,86110	16,67999
Prob	0,000000	0,000000	0,000000	0,000000	0,000000	0,000000

Source: EViews 12 output

The calculated F count for Sub Structural I is 528,8382 > F table 2,671 and the value of Prob, 0,000000 < 0,05, then H_0 is rejected and H_a is accepted, meaning that Investment, Unemployment and HDI simultaneously influence GRDP on Sumatra Island, Meanwhile, the calculated F count for Sub Structural II is 18,41969 > F table 2,439 and the value of Prob, 0,000000 < 0,05, then H_0 is rejected and H_a is accepted, meaning that Investment, Unemployment, HDI and GRDP simultaneously influence Income Inequality on Sumatra Island.

The calculated F count for Sub Structural I is 74,99017 > F table 2,719 and the value of Prob, 0,000000 < 0,05, then H_0 is rejected and H_a is accepted, meaning that Investment, Unemployment and HDI simultaneously influence GRDP on the island of Java, Meanwhile, the calculated F count for Sub Structural II is 15,54219 > F table 2,487 and the value of Prob, 0,000000 < 0,05, then H_0 is rejected and H_a is accepted, meaning that Investment, Unemployment, HDI and GRDP simultaneously influence Income Inequality on Java Island.

The calculated F count for Sub Structural I is 41,86110 > F table 2,719 and the value of Prob, 0,000000 < 0,05, then H_0 is rejected and H_a is accepted, meaning that Investment, Unemployment and HDI simultaneously influence GRDP on Sulawesi Island, Meanwhile, the calculated F count for Sub Structural II is 16,67999 > F table 2,487 and the value of Prob, 0,000000 < 0,05, then H_0 is rejected and H_a is accepted, meaning that Investment, Unemployment, HDI and GRDP simultaneously influence Income Inequality on Sulawesi Island.

T-Statistics Test Results

Table 4 T test results on the islands of Sumatra, Java and Sulawesi

	Sumatera island		Java Island		Sulawesi island	
	T Count	**Prob**	**T Count**	**Prob**	**T Count**	**Prob**
$X1 \rightarrow Z$	4,654784	0,0000	0,746432	0,4576	3,345001	0,0013
$X1 \rightarrow Y$	0,319442	0,7499	0,519402	0,6050	-2,433809	0,0172
$X2 \rightarrow Z$	-1,378269	0,1705	-0,088308	0,9299	-1,517159	0,1332
$X2 \rightarrow Y$	-2,288071	0,0237	0,589875	0,5571	-1,228135	0,2230
$X3 \rightarrow Z$	12,06259	0,0000	11,07691	0,0000	6,156310	0,0000
$X3 \rightarrow Y$	-6,834946	0,0000	-0,068997	0,9452	-1,755586	0,0830
$Z \rightarrow Y$	0,468888	0,6399	0,650382	0,5175	-3,239774	0,0018

Source: EViews 12 output

T Test Results on Sumatra Island
The influence of the independent variable on the dependent variable partially is as follows:
1. Path $X1 \rightarrow Z$ obtained a calculated t count of 4,654784 > t table value, namely 1,978 or the value of Prob. equal to 0,0000 < 0,05, then H1a is accepted, meaning that investment has a direct effect on GRDP on Sumatra Island.
2. Path $X1 \rightarrow Y$ obtained a calculated t count of 0,319442 < t table value, namely 1,978 or the value of Prob. is 0,7499 > 0,05, then H1b is rejected, meaning that investment has no direct effect on income inequality on Sumatra Island.
3. Path $X_2 \rightarrow Z$ obtained a calculated t count of 1,378269 < t table value, namely 1,978 or the Prob value, is 0,1705 > 0,05, then H_{1c} is rejected, meaning that unemployment has no direct effect on GRDP on Sumatra Island.

4. Path $X_2 \rightarrow Y$ obtained a calculated t count of 2,288071 > t table value, namely 1,978 or the value of Prob, equal to 0,0237 < 0,05, then H_{1d} is accepted, meaning that unemployment has a direct effect on income inequality on Sumatra Island.
5. Path $X_3 \rightarrow Z$ obtained a calculated t count of 12,06259 > t table value, namely 1,978 or the value of Prob. equal to 0,0000 < 0,05, then H1e is accepted, meaning that HDI has a direct effect on GRDP on Sumatra Island.
6. Path $X_3 \rightarrow Y$ obtained a calculated t count of 6,834946 > t table value, namely 1,978 or the value of Prob, equal to 0,0000 < 0,05, then H_{1f} is accepted, meaning that HDI has a direct effect on Income Inequality on Sumatra Island.
7. Path $Z \rightarrow Y$ obtained a calculated t count of 0,468888 < t table value, namely 1,978 or the value of Prob, is 0,6399 > 0,05, then H_{1g} is rejected, meaning that GRDP has no direct effect on Income Inequality on Sumatra Island.

T Test Results on Java Island
The influence of the independent variable on the dependent variable partially is as follows:
1. Path $X_1 \rightarrow Z$ obtained a calculated t count of 0,746432 < t table value, namely 1,990 or the value of Prob, is 0,4576 > 0,05, then H_{2a} is rejected, meaning that investment has no direct effect on GRDP on Java Island.
2. Path $X_1 \rightarrow Y$ obtained a calculated t count of 0,519402 < t table value, namely 1,990 or the value of Prob, is 0,6050 > 0,05, then H_{2b} is rejected, meaning that investment has no direct effect on income inequality on Java Island.
3. Path $X_2 \rightarrow Z$ obtained a calculated t count of 0,088308 < t table value, namely 1,990 or the value of Prob, is 0,9299 > 0,05, then H_{2c} is rejected, meaning that unemployment has no direct effect on GRDP on Java Island.
4. Path $X_2 \rightarrow Y$ obtained a calculated t count of 0,589875 < t table value, namely 1,990 or the value of Prob, is 0,5571 > 0,05, then H_{2d} is rejected, meaning that unemployment has no direct effect on income inequality on Java Island.
5. Path $X_3 \rightarrow Z$ obtained a calculated t count of 11,07691 > t table value, namely 1,990 or the value of Prob. equal to 0,0000 < 0,05, then H2e is accepted, meaning that HDI has a direct effect on GRDP on Java Island.

6. Path $X_3 \rightarrow Y$ obtained a calculated t count of 0,068997 < t table value, namely 1,990 or the value of Prob, is 0,9452 > 0,05, then H_{2f} is rejected, meaning that HDI has no direct effect on Income Inequality on Java Island.
7. Path $Z \rightarrow Y$ obtained a calculated t count of 0,650382 < t table value, namely 1,990 or the value of Prob, is 0,5175 > 0,05, then H_{2g} is rejected, meaning that GRDP has no direct effect on Income Inequality on Java Island.

T Test Results on Sulawesi Island
The influence of the independent variable on the dependent variable partially is as follows:
1. Path $X_1 \rightarrow Z$ obtained a calculated t count of 3,345001 > t table value, namely 1,990 or the Prob value, equal to 0,0013 < 0,05, then H_{3a} is accepted, meaning that investment has a direct effect on GRDP on Sulawesi Island.
2. Path $X_1 \rightarrow Y$ obtained a calculated t count of 2,433809 > t table value, namely 1,990 or the value of Prob, equal to 0,0172 < 0,05, then H_{3b} is accepted, meaning that investment has a direct effect on income inequality on Sulawesi Island.
3. Path $X_2 \rightarrow Z$ obtained a calculated t count of 1,517159 < t table value, namely 1,990 or the value of Prob. is 0,1332 > 0,05, then H_{3c} is rejected, meaning that unemployment has no direct effect on GRDP on Sulawesi Island.
4. Path $X_2 \rightarrow Y$ obtained a calculated t count of 1,228135 < t table value, namely 1,990 or the value of Prob, is 0,2230 > 0,05, then H_{3d} is rejected, meaning that unemployment has no direct effect on income inequality on Sulawesi Island.
5. Path $X_3 \rightarrow Z$ obtained a calculated t count of 6,156310 > t table value, namely 1,990 or Prob value, equal to 0,0000 < 0,05, then H_{3e} is accepted, meaning that HDI has a direct effect on GRDP on Sulawesi Island.
6. Path $X_3 \rightarrow Y$ obtained a calculated t count of 1,755586 < t table value, namely 1,990 or the value of Prob, is 0,0830 > 0,05, then H_{3f} is rejected, meaning that HDI has no direct effect on Income Inequality on Sulawesi Island.
7. Path $Z \rightarrow Y$ obtained a calculated t count of 3,239774 > t table value, namely 1,990 or the value of Prob. equal to 0,0018 < 0,05, then H_{3g} is accepted, meaning that GRDP has a direct effect on Income Inequality on Sulawesi Island.

Coefficient of Determination Test Results (R^2)

Table 5 Coefficient of Determination Test Results on the Islands of Sumatra, Java and Sulawesi

	Sumatera island		Java Island		Sulawesi island	
	Sub Structure I	**Sub Structure II**	**Sub Structure I**	**Sub Structure II**	**Sub Structure I**	**Sub Structure II**
Adjusted R-squared	0,978526	0,333904	0,727843	0,611931	0,596271	0,430414

Source: EViews 12 output

Explanation of the Determination Coefficient Test Results for Sumatra Island
The Adjusted R Square Sub Structural I value is 0,978526 or 97,8526%. The coefficient of determination value shows that the independent variables consisting of Investment (X_1), Unemployment (X_2) and HDI (X_3), are able to explain the GRDP (Z) variable on Sumatra Island amounting to 97,8526%, while the remaining is 2,1474% (100 - adjusted value R Square) is explained by other variables not included in this research model (Sugiyanto, 2022).

The Adjusted R Square Sub Structural II value is 0,333904 or 33,3904%. The coefficient of determination value shows that the independent variables consisting of Investment (X_1), Unemployment (X_2), HDI (X_3) and GRDP (Z), are able to explain the Income Inequality (Y) variable on Sumatra Island of 33,3904%, while the remaining is 66,6096 % (100 – adjusted R Square value) is explained by other variables not included in this research model (Sugiyanto, 2022).

Explanation of the Determination Coefficient Test Results for Java Island
The Adjusted R Square Sub Structural I value is 0,727843 or 72,7843%. The coefficient of determination value shows that the independent variables consisting of Investment (X_1), Unemployment (X_2) and HDI (X_3), are able to explain the GRDP (Z) variable on Java Island amounting to 72,7843%, while the remaining is 27,2157% (100 - adjusted value R Square) is explained by other variables not included in this research model (Sugiyanto, 2022).

The Adjusted R Square Sub Structural II value is 0,611931 or 61,1931%. The coefficient of determination value shows that the independent variables consisting of Investment (X_1), Unemployment (X_2), HDI (X_3) and GRDP (Z), are able to explain the Income Inequality (Y) variable on Java Island of 61,1931%, while the remaining is 38,8069 % (100 – adjusted R Square value) is explained by other variables not included in this research model (Sugiyanto, 2022).

Explanation of the Determination Coefficient Test Results for Sulawesi Island

The Adjusted R Square Sub Structural I value is 0,596271 or 59,6271%. The coefficient of determination value shows that the independent variables consisting of Investment (X_1), Unemployment (X_2) and HDI (X_3), are able to explain the GRDP (Z) variable on Sulawesi Island amounting to 59,6271%, while the remaining is 40,3729% (100 - adjusted value R Square) is explained by other variables not included in this research model (Sugiyanto, 2022).

The Adjusted R Square Sub Structural II value is 0,430414 or 43,0414%. The coefficient of determination value shows that the independent variables consisting of Investment (X_1), Unemployment (X_2), HDI (X_3) and GRDP (Z), are able to explain the Income Inequality (Y) variable on Sulawesi Island of 43,0414%, while the remaining is 56,9586 % (100 – adjusted R Square value) is explained by other variables not included in this research model (Sugiyanto, 2022).

Sobel Test Results

Table 6 Sobel Test Results on the Islands of Sumatra, Java and Sulawesi

Track	Sumatera island		Java Island		Sulawesi island	
	Sobel Test Results	Information	Sobel Test Results	Information	Sobel Test Results	Information
$X_1 \rightarrow Z \rightarrow Y$	0,467	H_{1h} Rejected	0,491	H_{2h} Rejected	-2,328	H_{3h} Accepted
$X_2 \rightarrow Z \rightarrow Y$	-0,444	H_{1i} Rejected	-0,088	H_{2i} Rejected	1,374	H_{3i} Rejected
$X_3 \rightarrow Z \rightarrow Y$	0,469	H_{1j} Rejected	0,651	H_{2j} Rejected	-2,869	H_{3j} Accepted

Source: EViews 12 output

Sumatra Island Sobel Test Results:
1. Path $X_1 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 0,467 < 1,958, then H_{1h} is rejected, meaning that investment has no indirect effect on Income Inequality through GRDP on Sumatra Island.
2. Path $X_2 \rightarrow Z \rightarrow Y$ produces a Sobel test result of 0,444 < 1,958, then H_{1i} is rejected, meaning that unemployment has no indirect effect on Income Inequality through GRDP on Sumatra Island.
3. Path $X_3 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 0,469 < 1,958, then H_{1j} is rejected, meaning that HDI has no indirect effect on Income Inequality through GRDP on Sumatra Island.

Java Island Sobel Test Results:
1. Path $X_1 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 0,491 < 1,958, then H_{2h} is rejected, meaning that investment has no indirect effect on Income Inequality through GRDP on Java Island.
2. Path $X_2 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 0,088 < 1,958, then H_{2i} was rejected, meaning that unemployment has no indirect effect on Income Inequality through GRDP on Java Island.
3. Path $X_3 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 0,651 < 1,958, then H_{2j} was rejected, meaning that HDI has no indirect effect on Income Inequality through GRDP on Java Island.

Sulawesi Island Sobel Test Results:
1. Path $X_1 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 2,328 > 1,958, then H_{3h} is accepted, meaning that investment has an indirect effect on Income Inequality through GRDP on Sulawesi Island.
2. Path $X_2 \rightarrow Z \rightarrow Y$ produces a Sobel test result of 1,374 < 1,958, then H_{3i} is rejected, meaning that unemployment has no indirect effect on Income Inequality through GRDP on Sulawesi Island.
3. Path $X_3 \rightarrow Z \rightarrow Y$ obtained a Sobel test result of 2,869 > 1,958, then H_{3j} is accepted, meaning that HDI has an indirect effect on Income Inequality through GRDP on Sulawesi Island.

5.0 CONCLUSION

Based on the data and results of the analysis carried out in this research, the following conclusions can be drawn:

Partially, investment has no direct effect on income inequality on the islands of Sumatra and Java, but has a direct negative effect on income inequality on the island of Sulawesi, and investment has no indirect effect on Income Inequality

through GRDP on Sumatra and Java. However, investment has an indirect negative effect on Income Inequality through GRDP on Sulawesi Island.

Partially, unemployment has a direct negative effect on GRDP on Sumatra Island, but has no direct effect on GRDP on Java and Sulawesi Islands. And unemployment has no indirect effect on Income Inequality through GRDP on Sumatra Island, Java Island and Sulawesi Island.

Partially, HDI has a direct negative effect on Income Inequality on Sumatra Island, but HDI has no direct effect on Income Inequality on Java and Sulawesi Islands. Then HDI has no indirect effect on Income Inequality through GRDP on Sumatra and Java Island, but HDI has an indirect negative effect on Income Inequality through GRDP on Sulawesi Island. Both in Sub Structural I and Sub Structural II the variables Investment, Unemployment, HDI and GRDP simultaneously influence Income Inequality on the islands of Sumatra, Java and Sulawesi. The value of the coefficient of determination (R^2) of the variables Investment (X_1), Unemployment (X_2), HDI (X_3) and GRDP (Z), is able to explain the variable Income Inequality (Y) on Sumatra Island worth 33,3904%, Java Island worth 61,1931% and Sulawesi worth 43,0414%. Meanwhile, the remaining 66,6096% (Sumatra Island), 38,8069% (Java Island) and 56,9586% (Sulawesi Island) is explained by other variables not included in this research model (100 - adjusted R Square value). From the results of the small coefficient of determination (R^2), the differences in phenomena between the three islands are caused by other factors such as population size, regional government policies, number of administrative areas and so on.

6.0 ACKNOWLEDGEMENT

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