

Unemployment and Income Inequality: A Comparative Analysis in Sumatra and Sulawesi Island

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Abstract. Unemployment is an unavoidable situation in developing or developed countries. Unemployment has significant implications for the emergence of various crime vulnerabilities and the emergence of social anxiety problems, and poverty so there are limitations that need to be considered. Very rapid population growth will affect the employment conditions of an area and with an increase in population, the capacity for employment must be adequate so that there is no high unemployment rate. The research was conducted using a comparative method, namely descriptive research through investigation and comparison of one factor to another from situations and phenomena related to selecting specific factors. Comparisons are made on conditions in Sumatra and Sulawesi islands for 13 years, from 2009 to 2021.

Keywords : unemployment; income inequality; Sumatra; Sulawesi

1 Introduction

Rapid population growth will affect the employment conditions of an area and with an increase in population, the availability of employment opportunities must be sufficient so that there is no high unemployment rate. Population concentrated in an area will cause population density so that it will reduce the opportunity to get a job in that area. The level of population density in Indonesia continues to increase (figure 1) causing an imbalance between regions.

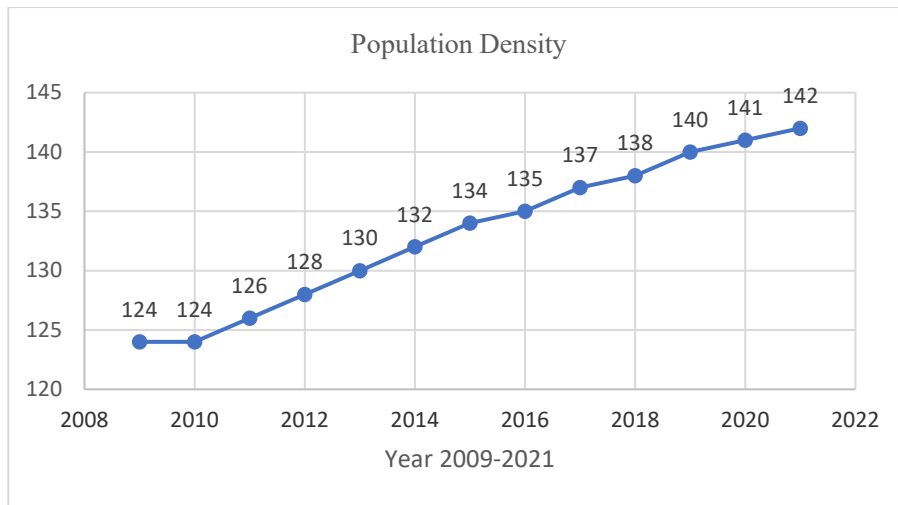


Fig. 1. The level of population density in Indonesia in 2009-2021.

In general, development problems in developing countries should focus not only on achieving growth rates but also on equitable distribution of development outcomes. Inequality that occurs between islands and between provinces can be seen from the difference in the level of GRDP per capita between regions. The very rapid population growth not only has an impact on the issue of equity, but also the quality and relevance of the population, especially in terms of employment. This growth will affect the employment conditions of a region. Unemployment is not only an economic problem, but also a social and political problem. Unemployment has significant implications for the emergence of various crime vulnerabilities, social problems, and poverty so there are limits that need to be considered.

Unemployment is a situation that cannot be avoided in developing or developed countries, the problem of employment either directly or indirectly is the increase in the number of the workforce which increases while employment opportunities are limited, causing unemployment. All of these relate to issues such as income inequality, poverty, slowing economic growth, urbanization, and political instability.

The open unemployment rate (TPT) in Indonesia in 2009-2021 is shown in Figure 2. The year 2009 had the highest unemployment rate in the last 13 years, the highest figure was 8.14 and decreasing every year. The increase occurred again in 2015, the unemployment rate rose to 5.81 and then decreased again. However, the high increase occurred in 2020 towards 2021, the year when Indonesia experienced a pandemic.

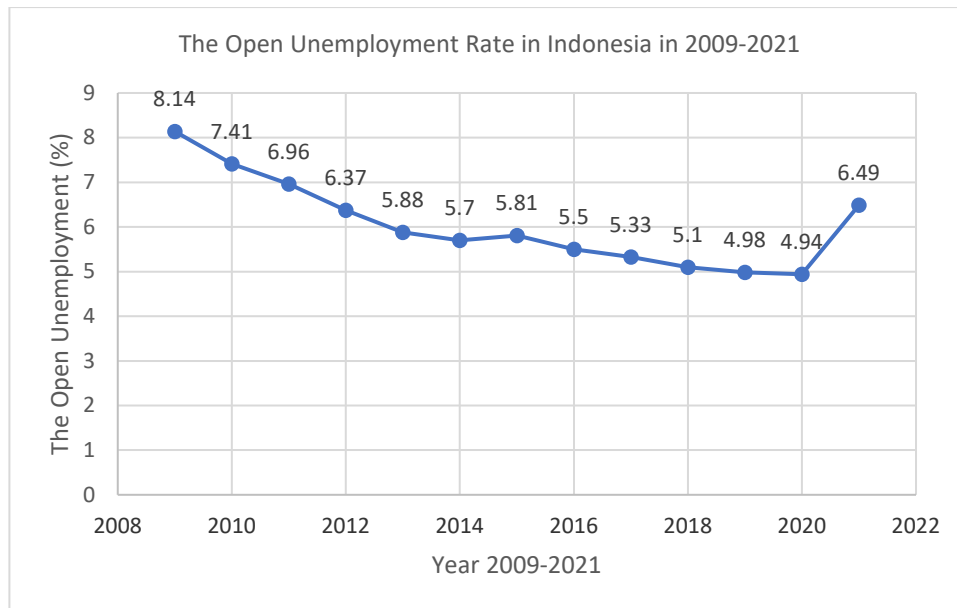


Fig.2. The Open Unemployment Rate (TPT) in Indonesia in 2009-2021.

The inequality of opportunity to get a job, which is reflected in the unemployment in the big islands in Indonesia, can be seen in Figure 3. The highest unemployment condition on each island from 2009-2021 occurred in Java Island and the lowest was in Bali and Nusa. The maximum unemployment rate which has the smallest difference occurs on the islands of Sumatra and Sulawesi, where the unemployment rate in Sulawesi is 0.22% higher than the island of Sumatra. However, the difference between the lowest number and the average figure of 0.87% occurred with the condition of the island of Sumatra which was higher in number than the island of Sulawesi.

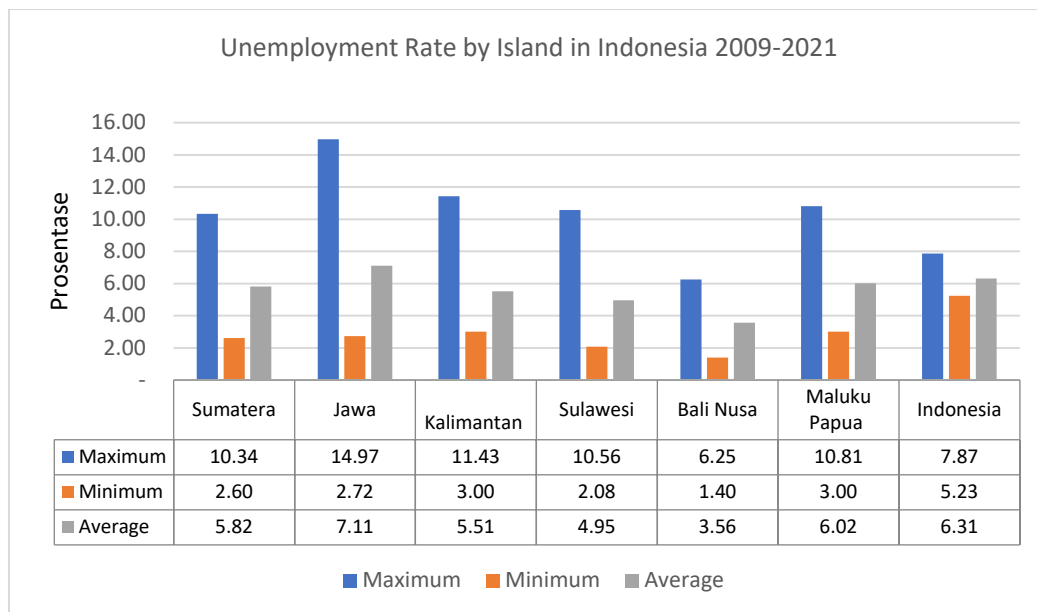


Fig.3. Unemployment Rate by Island in Indonesia 2009-2021

Comparing the conditions of unemployment and income inequality on the two islands, such as Sumatra and Sulawesi, it is carried out so that it can be seen whether in the same year the unemployment and income inequality conditions are the same or significantly different the two islands.

2 Literature

Unemployment consists of residents not working but still looking for work, or preparing to do business, or thinking they can't get a job (desperate), or have been accepted for work but have not started [1]. Unemployment is defined as a condition of a person belonging to the labor force category who does not have a job and is actively looking for work [2] [3].

The Open Unemployment Rate (TPT) is the percentage of the number of unemployed to the total workforce. The Labor Force is a category of population aged 15 years who are working or have a job but temporarily not working. Unemployment, namely: (1) residents who are actively looking for work (2) residents who are preparing for business (3) residents who are not looking for work because they feel it is impossible to get a job, (4) groups of people who are not actively looking for work on the grounds that they already have a job but have not start working. The calculation of the open unemployment rate is as follows: The open unemployment rate in the form of a percentage is obtained from the number of unemployed (persons) divided by the number of labor force (persons) multiplied by one hundred percent [4]

Unemployment is an unavoidable situation in developing or developed countries. Unemployment has significant implications for the emergence of various crime vulnerabilities and the emergence of social, political and poverty anxiety problems so there are limitations that need to be considered. Unemployment causes a decrease in the level of prosperity and welfare

in society. To see the welfare of the community can be seen based on the number of the unemployment rate. The impact of self-inflicted unemployment also has an impact on the government, family and the environment.

Income inequality has an impact on people's conditions, including affecting the level of poverty and slowing the rate of economic growth. There are eight factors that cause income inequality in a region: (1) If population growth increases significantly, it causes per capita income to decrease (2) Inflation where monetary income increases, which is not proportional to the increase in the production of goods. (3) uneven development between regions. (4) high capital-intensive project investment. (5) minimum social movement. (6) The implementation of the import policy has an impact on increasing the price of industrial goods in order to protect capitalist companies. (7) low currency exchange rates (8) Damage to the Home industry. One way to measure the level of income inequality in a country is to use the Gini Ratio indicator.

The Gini coefficient is a calculation method for measuring the degree of inequality in the distribution of income, wealth, and population of a country. [5]). In the calculation by dividing the ratio of the plane located between the diagonal line and the Lorenz curve divided by the area of the half plane where the curve is. Lorenz Curve Describing the vertical axis shows the share of the total amount of income earned by each percentage of the population while the horizontal axis shows the cumulative percentage of the population. Then there is the "perfect evenness line" shown on the diagonal line. At all points on the diagonal line, the percentage of acceptance of the opinion is the same as the percentage of the population. The level of evenness is shown in the Lorenz line from the diagonal line, the farther the distance from the diagonal line, the higher the level of inequality. On the other hand, the higher the level of income distribution distribution is shown, the closer the Lorenz curve is to the diagonal line. The value of the Gini coefficient is close to zero (0) then a more even distribution of income. On the other hand, if the Gini coefficient is closer to one, then an income distribution is said to be more unequal. In the Lorenz curve, the diagonal line represents perfect equality. Measurement of Income Inequality The Gini Ratio value has a number below 0.40 then Income Distribution with a Low Inequality Level, if between numbers 0.40-0.50 then the Inequality Level is Low, if the number is greater than 0.50 then the Inequality Level is High.

Previous research was conducted by Saunders who stated that persistent and high unemployment condition in Australia has presented a major challenge for the welfare state from two directions, 1) it has eroded the funding base and 2) it has increased the demands on welfare programs because of the consequences for poverty and inequality resulting from high unemployment. [6]

3 Methodology

Descriptive analysis is the method used to determine the value of the variable independently, namely the variable Unemployment and Income Inequality on the islands of Sumatra and Sulawesi. Sources of data in the study were obtained from Bank Indonesia (BI) and Statistic Indonesia (BPS).

The study uses time series secondary data using data in each province on the island of Sumatra from 2009 to 2021 and data in each province on the island of Sulawesi from 2009 to 2021. Data analysis uses the Two Way Anova test but previously it will Normality and heteroscedasticity tests. The research hypotheses to be tested are:

- There is a significant difference between unemployment on the island of Sumatra and Sulawesi
- There is a significant difference in unemployment conditions based on the same year
- There is interaction between islands in the same year on unemployment conditions
- There is a significant difference between income inequality on the islands of Sumatra and Sulawesi
- There is a significant difference in income inequality conditions based on the same year
- There is interaction between islands in the same year on income inequality conditions

4 Result and Discussion

Descriptive analysis was carried out separately for each island for 13 years of research data samples. The unemployment condition of each province on the island of Sumatra (figure 4) shows that of the 13 years of the research sample on the island of Sumatra, the province with the highest unemployment rate is Riau Islands in 2020 and 2021, the next province is Aceh in 2013 and 2015. The lowest unemployment rate is in Bangka Belitung province in 2016.

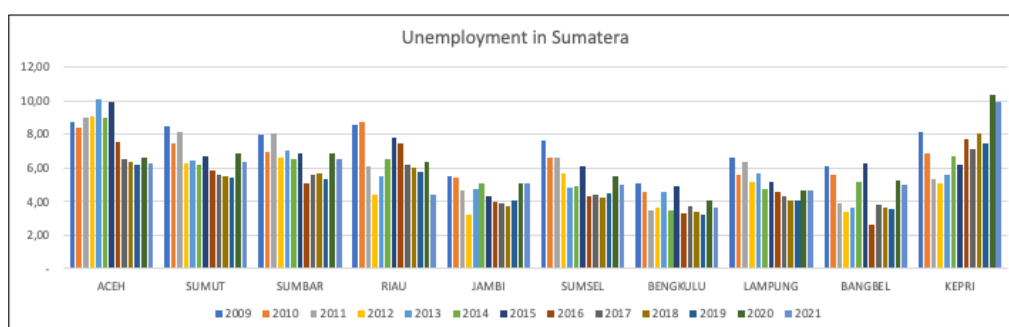


Fig.4. Unemployment Rate of each Province in Sumatera.

The unemployment condition of each province in Sulawesi (figure 5) shows that from the 13-year research sample on the island of Sulawesi, the province with the highest unemployment rate is North Sulawesi in 2009, 2011 and 2015, followed by South Sulawesi province in 2009, 2010 and 2011. The lowest unemployment was in the province of West Sulawesi in 2012, 2014 and 2013.

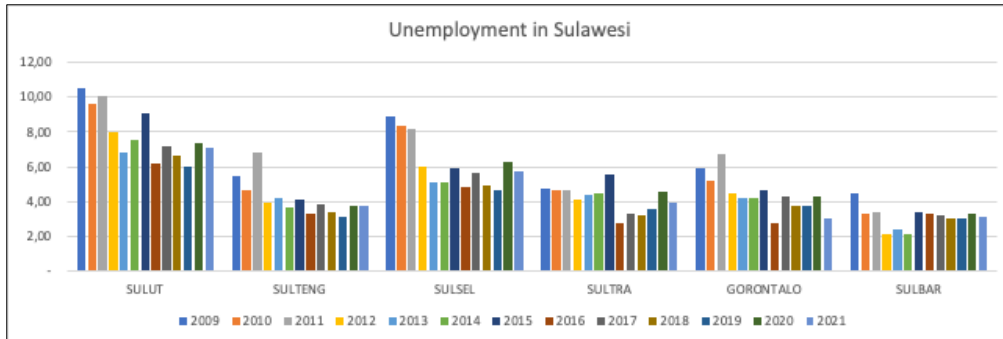


Fig.5. Unemployment Rate of each Province in Sulawesi

The condition of income inequality in each province on the island of Sumatra (figure 6) shows that from the 13-year study sample on the island of Sumatra, the province with the highest income inequality rate is Riau Islands in 2014, followed by South Sumatra province in 2011 and 2012. The lowest level of income inequality located in Bangka Belitung province in 2021 and Jambi in 2009.

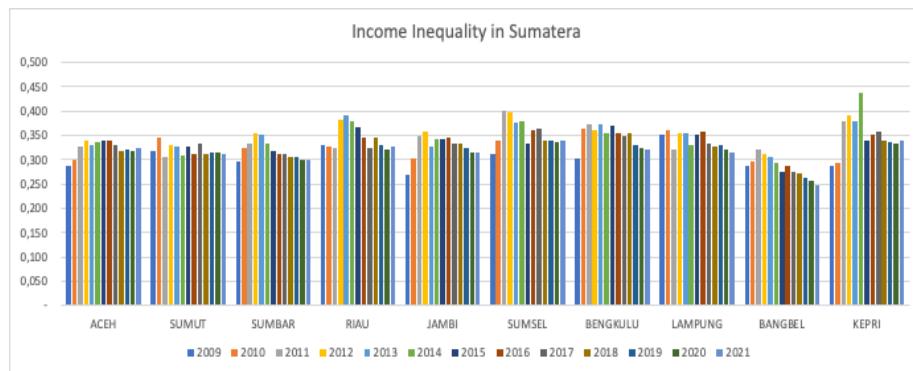


Fig.6. Income Inequality of each Province in Sumatera.

The condition of income inequality in each province in Sulawesi (figure 7) shows that from the 13-year research sample on the island of Sulawesi, the province with the highest income inequality rate is North Sulawesi in 2012, 2013 and 2014, the next province is Gorontalo in 2013 and 2014. The lowest unemployment rate found in West Sulawesi province in 2009 and North Sulawesi province in 2009.

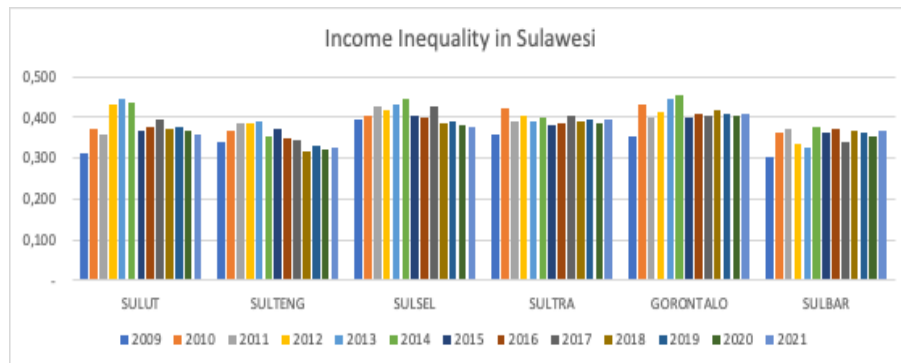


Fig.7.Income Inequality of each Province in Sulawesi

The analysis in this research is a two-way ANOVA, an analysis to compare whether there are significant differences in unemployment conditions in Sumatra with unemployment conditions in Sulawesi, whether there are differences in conditions on the two islands when compared in the same year and to find out whether there is an interaction between unemployment conditions on the island and the same year.

However, before testing with two-way ANOVA, the research data needs to test for normality and homogeneity. Normality test results are shown in table 1, the data is declared normally distributed if the Sig value on Kolmogorov-Smirnov > 0.05 . Based on table 1, the data that are not normally distributed are unemployment on the island of Sulawesi, while other data based on the island and year on both variables have a Sig value > 0.05 so it can be said that the data is normally distributed. Homogeneity testing is carried out on the data of the two variables and if the sig number on the Levene Test > 0.05 then the data is homogeneous, the test results in table 2 show that the Sig Levene test income inequality value is $0.630 > 0.05$, it can be concluded that the income inequality data has a homogeneous. The unemployment variable has a sig value of $0.944 > 0.05$, which means the data is homogeneous. The conclusion from these two tests is that the data can be tested with a two-way Anova

Table 1. Normality test result

Variabel		Income Inequality	Unemployemen
Island	Sumatera	0,200	0,200
	Sulawesi	0,200	0,000
Year	2009	0,200*	0,200*
	2010	0,200*	0,200*
	2011	0,200*	0,200*
	2012	0,200*	0,200*
	2013	0,200*	0,200*
	2014	0,200*	0,200*
	2015	0,200*	0,200*
	2016	0,200*	0,200*
	2017	0,200*	0,050
	2018	0,200*	0,159
	2019	0,053	0,200*
	2020	0,118	0,200*
2021	0,200*	0,200*	

Table 2. Homogeneity test result

Variable	Levene's Test (Sig)
Income inequality	0,630
Unemployment	0,944

Two-way ANOVA analysis to perform hypothesis testing. Table 3 shows the results of a two-way ANOVA on the unemployment variable, in the island category having a sig value of $0.00 < 0.05$, which means that there is a significant difference between unemployment on the island of Sumatra and Sulawesi. The year category has a sig value of $0.00 < 0.05$ which means that there is a significant difference in unemployment conditions based on the same year. The results of the interaction test between islands and years have a sig value of $0.978 > 0.05$, which means that there is no interaction between islands in the same year under unemployment condition

Table 3. Tests of Between-Subjects Effects Variable Unemploymen

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	159.031 ^a	25	6.361	2.229	.001
Intercept	5656.808	1	5656.808	1981.860	.000
Island	36.790	1	36.790	12.889	.000
Year	111.649	12	9.304	3.260	.000
Island * Year	11.949	12	.996	.349	.978
Error	519.481	182	2.854		
Total	6958.199	208			
Corrected Total	678.513	207			

Based on table 4, the results of the two-way ANOVA on the income inequality variable, the island category has a sig value of $0.00 < 0.05$, which means that there is a significant difference between income inequality on the island of Sumatra and Sulawesi. The year category has a sig value of $0.00 < 0.05$ which means that there is a significant difference in income inequality conditions based on the same year. The results of the interaction test between islands and years have a sig value of $0.983 > 0.05$, which means that there is no interaction between islands in the same year in conditions of income inequality.

Table 4. Tests of Between-Subjects Effects Variable Income Inequality

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.183 ^a	25	.007	8.632	.000
Intercept	24.915	1	24.915	29303.501	.000
Island	.130	1	.130	152.434	.000
Year	.048	12	.004	4.688	.000
Island * Year	.003	12	.000	.329	.983
Error	.155	182	.001		
Total	25.965	208			
Corrected Total	.338	207			

5 Conclusion

Based on the results of the analysis test, the conclusions of the research hypothesis are as follows:

Unemployment conditions on the islands of Sumatra and Sulawesi proved to have significant differences. A comparison made by looking at the average unemployment rate on the islands of Sumatra and Sulawesi states that there is a significant difference between the two islands, this result supports the data in Figure 3 which shows an average difference of 0.87%.

Unemployment conditions if categorized based on the same year on the islands of Sumatra and Sulawesi, are proven to have significant differences. The comparison made by looking at the average unemployment rate for 13 years on the islands of Sumatra and Sulawesi reveals a significant difference between each year.

The test of the interaction between islands in the same year on unemployment conditions based on the calculation results proved that there was no significant interaction between the island category and the year on unemployment conditions on the islands of Sumatra and Sulawesi for 13 years of research sample data.

The condition of income inequality on the islands of Sumatra and Sulawesi is proven to have a significant difference. A comparison made by looking at the average between the income inequality figures on the islands of Sumatra and Sulawesi reveals a significant difference between the two islands.

The condition of income inequality, if categorized based on the same year on the islands of Sumatra and Sulawesi, is proven to have a significant difference. A comparison made by looking at the average income inequality rate for 13 years on the islands of Sumatra and Sulawesi shows that there is a significant difference between each year.

The test of the interaction between islands in the same year on income inequality based on the calculation results proved that there was no significant interaction between the island category and the year on income inequality that occurred on the islands of Sumatra and Sulawesi for 13 years of research sample data.

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