Poverty in Riau Province: The Role of Economic Growth, Income Distribution, and Human Development

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| KEYWORDS	ABSTRACT
Poverty, Economic Growth, Income Distribution, Human Development Index, Panel Data, Riau Province	This study aims to analyze the effect of economic growth, income distribution, and the Human Development Index (HDI) on poverty levels in Riau Province during the 2018-2021 period. The data used is secondary data from the Central Statistics Agency (BPS), analyzed using panel data regression with a random effect approach. The results show that economic growth has a negative and significant effect on poverty levels, with each 1% increase in economic growth reducing poverty levels by 0.0899%. The Human Development Index also has a negative and significant effect, where a 1-point increase in HDI reduces poverty levels by 0.5371%. However, income distribution (measured by the Gini Index) does not significantly affect poverty. Simultaneously, these three variables significantly influence poverty levels, as indicated by an F-test probability value of 0.0024. These findings highlight the importance of inclusive economic growth and improving human development quality as key strategies for poverty alleviation in Riau Province. This study recommends an integrated policy approach, including strengthening productive economic sectors, reducing income inequality, and enhancing education and healthcare quality to achieve sustainable development.

1. INTRODUCTION

Riau Province is known as one of the richest provinces in Indonesia, ranking third based on its contribution to the national Gross Domestic Product (GDP), especially from the oil, gas, and oil palm plantation sectors. However, this economic wealth is not fully reflected in the welfare of its people. The poverty rate in Riau remains a concern, with the percentage of the poor population reaching 6.67% in March 2024 (Central Statistics Agency of Riau Province., 2024).

Figure 1. Percentage of Poor Population in Riau Province in 2018-2024
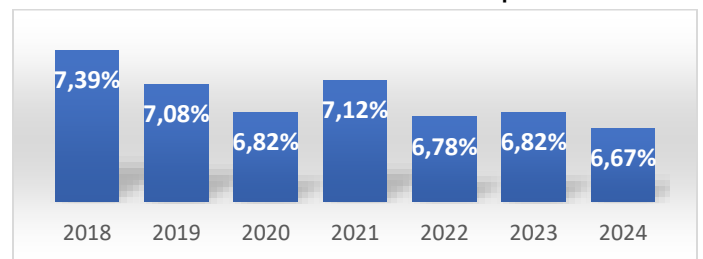
Source: BPS, Riau Province, 2024

The poverty rate in Riau Province during the 2018-2024 period is quite high, although it shows a downward trend from 7.39% in 2018 to 6.67% in 2024. This figure puts Riau in a category that still needs attention, especially

when compared to other provinces that have lower poverty rates. In addition, the majority of the poor are in rural areas, indicating that there is a development inequality between cities and villages. Fluctuations in poverty rates, such as the rise in 2021, highlight the region's economic vulnerability to a variety of factors, including the COVID-19 pandemic and fluctuations in the prices of key commodities such as palm oil and petroleum.

Inequality in income distribution and access to basic services such as education and health are the main factors that cause high poverty rates despite the province's economic wealth. This condition shows the need for more inclusive policies to ensure that the wealth of natural resources can be enjoyed by all levels of society in Riau (Pebriani, 2022).

Economic growth is one of the main indicators in measuring people's welfare because it reflects the increase in production capacity and income of a region. According to Todaro and Smith in (Nainggolan, 2020), sustainable economic growth can create jobs, increase income, and reduce poverty. In Riau Province, economic growth over the past few years has shown positive dynamics, even though it was affected by the COVID-19 pandemic. In 2023, Riau's economic growth was recorded at 4.21% (year-on-year), driven by leading sectors such as oil, gas, and oil palm plantations (Central Statistics Agency of Riau Province., 2024). However, the sustainability of this growth needs to be balanced with a more equitable distribution to ensure that the benefits can be felt by all levels of society, so that they can improve welfare in an inclusive manner.

Income distribution inequality is closely related to poverty levels, including in Riau Province. According to the development economics theory put forward by Simon Kuznets in (Anggraini, 2023), in the early stages of development, economic growth is often accompanied by an increase in income inequality before finally decreasing at a later stage of development. In Riau, despite the high economic growth, income inequality is still a challenge, as reflected in the value of the Gini Index. This inequality contributes to poverty because low-income groups do not have equal access to economic opportunities and basic services such as education and health. High inequality can hinder poverty reduction, even if economic growth is ongoing (Sriwahyuni, 2020).

The Human Development Index (HDI) has a significant relationship with the poverty rate in Riau Province, because the HDI reflects the quality of life of the community which includes aspects of health, education, and living standards. According to the human development theory developed by Amartya Sen in (Widodo et al., 2011), poverty is not only measured in terms of income, but also from the inability to access basic services such as quality education and health. In Riau Province, although HDI has increased, there is still inequality in access to these services, especially in remote areas. A more equitable increase in HDI can reduce poverty by giving people the ability to acquire better skills, live healthier lives, and increase work productivity. Therefore, investment in education and the health sector is very important to reduce poverty rates in Riau, because both can improve the quality of life and open up wider economic opportunities for the poor (Suharlina, 2020).

2. METHOD

This study uses a quantitative approach with panel data analysis covering the period from 2018 to 2021. The data used is secondary data

obtained from the Central Statistics Agency (BPS) of Riau Province. The dependent variable in this study is the poverty rate, while the independent variables include economic growth, the Gini Index (as a measure of income distribution inequality), and the Human Development Index (HDI). The selection of the period 2018-2021 is based on the limited data available for all the variables analyzed in this study, so that the period is considered the most representative to describe the relationship between the existing variables. To analyze the data, this study uses panel data regression analysis, which allows data processing involving variations between time and between regions, and can identify the influence of each variable on poverty levels in more depth.

In this study, the data analysis technique used involves several steps of data processing with a panel data regression approach. The first step is to estimate the model using three approaches, namely Common Effect, Fixed Effect, and Random Effect. The selection of the right model between Common Effect and Fixed Effect is carried out through the Chow test or likelihood ratio test, which aims to test whether a more complex model (Fixed Effect) is more suitable than a simpler model (Common Effect). Furthermore, the selection of the model between Fixed Effect and Random Effect was carried out by the Hausman test, which was used to test whether the Fixed Effect model was more suitable than the Random Effect. The Hausman test tested whether there was a systematic difference between the coefficient estimates in the two models. Finally, the selection of the model between Random Effect and Common Effect is carried out through the Lagrange Multiplier (LM) test, which aims to select the most efficient model by considering heteroscedasticity assumptions and model specifications. After choosing the right model, the next step is to perform a classical assumption test to ensure the validity of the model. The classical assumption tests carried out include normality tests, multicollinearity tests, heteroscedasticity tests, and autocorrelation tests, which aim to test whether the data meet the basic assumptions of regression, so that the resulting model is reliable and valid (Sholihin et al., 2021).

After confirming that the model used meets the classical assumption test, the next step is to conduct an analysis with a determination coefficient test (R2), t-test, and F test. The higher the R2 value, the better the model's ability to explain data variations. The t-test was carried out to test the influence of each independent variable partially on the dependent variable. Through the t-test, it can be known whether each independent variable has a significant influence on the dependent variable at a certain level of significance. This provides an in-depth understanding of the individual role of each independent variable in influencing poverty levels. Meanwhile, the F test is used to test the influence of independent variables simultaneously on dependent variables. This test helps determine whether the overall regression model has statistical significance in explaining the relationship between independent and dependent variables. If the results of the F test are significant, then it can be concluded that the model as a whole is relevant and can be used to predict dependent variables based on existing independent variables (Baltagi et al., 2023).

3. RESULT AND DISCUSSIO

To determine the best model of Common Effect, Fixed Effect and random Effect, the Chow, Hausman and Lagrange Multiplier tests were carried out.

Table 1. Chow Test Results,
Hausman and Lagrange Multiplier

Test	Probability
Chow	Prob > F = 0.0000
Hausman	Prob > x2 = 0.6303
Lagrange Multiplier	Prob > chibar2 = 0.0000

Source: Processed Stata 17, 2024

The results of the best model test between Common Effect, Fixed Effect, and Random Effect were carried out through three statistical tests, namely the Chow Test, Hausman Test, and Lagrange Multiplier Test. Based on the results of the Chow test with a Prob value of > F = 0.0000, it shows that the Fixed Effect model is more accurate compared to the Common Effect model, because a very small probability value indicates that the difference between the two models is statistically significant. Furthermore, the results of the Hausman test with Prob > x2 = 0.6303 show that there is no significant difference between the Fixed Effect and Random Effect models, as a large probability value (more than 0.05) indicates that the two models do not differ significantly in terms of coefficient estimation. Therefore, the Random Effect model can be considered as an alternative. Finally, the Lagrange Multiplier test with a Prob value of > chibar2 = 0.0000 shows that the Random Effect model is more precise compared to the Common Effect model, as a very small probability value indicates that the Random Effect model provides more efficient results than the Common Effect. Based on the results of the three tests, the Random Effect model was selected as the best model for the regression analysis of this panel data.

Multiple Linear Regression Test with Random Effect

Based on the Multiple Linear Regression test with Random Effect, the following equation can be made:

$$Y = 46.8556 - 0.0899X_1 - 0.6786X_2 - 0.5371X_3 + e$$

Based on the resulting regression equation, it can be interpreted that the poverty level in Riau Province is influenced by economic growth, income distribution gap (Gini Index), and Human Development Index (HDI). A constant of 46.8556 indicates that if the variables of economic growth, Gini Index, and HDI are zero, the poverty rate is estimated to be 46.8556%. The variable coefficient of economic growth of -0.0899 indicates that every 1% increase in economic growth will reduce the poverty rate by 0.0899%, assuming the other variables remain constant. Furthermore, the Gini Index coefficient of -0.6786 indicates that an increase of 1 unit in the Gini Index is estimated to reduce the poverty rate by 0.6786%, although this variable is not statistically significant. Meanwhile, the HDI coefficient of -0.5371 shows that an increase of 1 unit in HDI will reduce the poverty rate by 0.5371%. From these results, it can be concluded that economic growth and improving the quality of human development (HDI) have a significant influence in reducing poverty in Riau Province, while the impact of income distribution gap requires further study because it is not statistically significant.

Statistical Test
1. Determination Coefficient Test (R-Squared)

Based on the results of regression analysis with the random effect model, the resulting

determination coefficient (R-squared) has three components, namely within of 0.2196, between of 0.4095, and overall of 0.4078. The overall R-squared value of 0.4078 shows that around 40.78% of the variation in poverty rates in Riau Province can be explained by independent variables in the model, namely economic growth, income distribution gap (Gini Index), and Human Development Index (HDI). The rest, amounting to 59.22%, was influenced by other factors outside the model that were not included in this analysis. An within R-squared value of 0.2196 indicates that the model is able to explain 21.96% of poverty variations based on changes over time within a province, while an between R-squared of 0.4095 indicates that the model can explain 40.95% of the variation in poverty between provinces on average during the study period. These results show that the independent variable has a moderate influence in explaining poverty levels, and there are other variables that may be important to add to the model to improve the explanatory power.

2.   Test t (Partially)

Based on the results of the t-test, the influence of each independent variable on the poverty level in Riau Province can be partially interpreted. The economic growth variable has a coefficient of -0.0899 with a p-value of 0.002, which shows that this variable has a significant effect on the poverty rate at a significance level of 5%. This indicates that every 1% increase in economic growth will reduce the poverty rate by 0.0899%, assuming the other variables remain constant. Furthermore, the variable income distribution gap (Gini Index) has a coefficient of -0.6786 with a p-value of 0.858. Because the p-value is greater than the significance level (e.g. 0.05), this variable has no significant influence on the poverty level in the model. Meanwhile, the Human Development Index (HDI) variable

has a coefficient of -0.5371 with a p-value of 0.008, which shows a significant influence on the significance level of 5%. This means that every 1 unit increase in HDI will reduce the poverty rate by 0.5371%, assuming other variables remain the same. These results show that partially, economic growth and HDI have a significant influence on poverty reduction in Riau Province, while the income distribution gap is not significant in this model.

3.   Test F (Simultaneously)

Based on the results of the F (simultaneous) test, the Prob value of > chi2 of 0.0024 shows that simultaneously independent variables, namely economic growth, income distribution gap (Gini Index), and Human Development Index (HDI), have a significant effect on the poverty rate in Riau Province at a significance level of 5%. This means that, together, these three variables are able to explain the change in the poverty level in the region. These results indicate that the regression model used as a whole can be considered feasible to analyze the relationship between independent variables and poverty levels. Thus, policies that focus on increasing economic growth, reducing income distribution gaps, and improving the quality of human development at the same time can be an effective strategy in reducing poverty rates in Riau Province.

Discussion

The results show that economic growth, income distribution (represented by the Gini Index), and human development (represented by the Human Development Index/HDI) have various influences on poverty rates in Riau Province. The panel data regression model with the random effect approach used successfully explained about 40.78% of the variation in

poverty level (R-squared overall = 0.4078), while the rest was influenced by other factors outside the model.

Partially, the economic growth variable has a coefficient of -0.0899 and is significant at a significance level of 5% (p-value = 0.002). This suggests that every 1% increase in economic growth can lower the poverty rate by 0.0899%, assuming other variables remain constant. These findings are in line with economic theory that states that economic growth creates better income opportunities, employment, and access to resources, thereby contributing to poverty reduction. However, although economic growth has a positive impact, the magnitude of the relatively small influence shows that the effect of economic growth on poverty in Riau is still limited, likely because the distribution of growth benefits is not evenly distributed.

The income distribution variable (Gini Index) has a coefficient of -0.6786 but is not significant (p-value = 0.858). This insignificance indicates that the income distribution gap does not have a strong enough influence on the poverty rate in Riau Province in the study period. This can be explained by assuming that although inequality exists, poverty rates may be more influenced by other factors such as economic structure, access to education, or the quality of public services.

The results of this study are consistent with various previous studies and economic theories that support the relationship between economic growth, income distribution, human development, and poverty levels. (Todaro & Smith, 2015) in Economic Development emphasizes that economic growth is one of the main determinants of poverty alleviation, because it creates greater employment opportunities and incomes. The discovery that economic growth in Riau has a significant

impact on poverty reduction is in line with this view. However, its relatively small effect suggests that the benefits of economic growth have not been fully evenly distributed, which supports the finding (Ravallion, 2001) that economic growth is effective in reducing poverty when accompanied by a fair distribution of income.

Although the Gini Index in this study is not significant, economic theory and previous research, such as by (Liu, 2012), suggest that income distribution inequality can significantly affect poverty rates, especially in developing countries. This insignificance can be caused by the characteristics of Riau's local economy, where inequality may be more influenced by the concentration of economic sectors, such as the dominance of the oil and gas industry, which tends to be less inclusive of the poor. This is also supported by research (Rosyadi, 2017), which shows that the relationship between inequality and poverty is often mediated by economic structure.

Meanwhile, the Human Development Index (HDI) variable has a coefficient of -0.5371 and is significant at a significance level of 5% (p-value = 0.008). This means that every 1 point increase in HDI can reduce the poverty rate by 0.5371%, assuming other variables remain the same. These results confirm that human development, which includes indicators of health, education, and living standards, plays an important role in poverty alleviation. The increase in HDI reflects an improvement in the quality of life of the community, which in turn opens up better economic opportunities and increases individual competitiveness in the labor market.

The findings regarding the significant and strong role of HDI in reducing poverty levels are also supported by the human development

theory introduced by (Siregar & Hasibuan, 2024), human development that includes health, education, and living standards is an important foundation to improve individual capabilities, so that they can get out of the poverty trap. Previous research by (Pratama, 2014) also showed that increasing HDI significantly accelerated poverty reduction in various developing countries.

Simultaneously, the results of the F test show that the three independent variables together have a significant effect on the poverty rate (p-value = 0.0024). These findings indicate that poverty reduction efforts cannot rely on just one factor, but require a holistic approach involving inclusive economic growth, reducing income inequality, and improving the quality of human development.

Simultaneously, this study emphasizes the importance of a multidimensional approach in poverty alleviation, as suggested by the concept of sustainable development from UNDP (United Nations Development Programme, 2016). This approach involves economic growth, income redistribution, and improving the quality of life of the community at the same time. By linking these results to previous research and supporting theories, this study provides relevant empirical evidence to support more holistic policy formulations in addressing poverty in Riau Province.

Thus, policies to reduce poverty in Riau Province should be focused on three main things: (1) Promoting equitable and sustainable economic growth, especially in sectors that can absorb poor workers; (2) Reducing income inequality through redistribution policies, such as targeted social assistance programs and access to economic opportunities for vulnerable groups; and (3) Improving the quality of education, health, and basic infrastructure to improve HDI. An integrated approach will be more effective in significantly reducing poverty in Riau Province.

4. CONCLUSION

Based on the results of panel data analysis on the influence of economic growth, income distribution (Gini Index), and Human Development Index (HDI) on poverty levels in Riau Province, it can be concluded that economic growth has a negative and significant influence on poverty levels. Every 1% increase in economic growth can reduce the poverty rate by 0.0899%. This shows that economic growth plays an important role in creating income and employment opportunities, although the impact is relatively small. On the other hand, the income distribution measured by the Gini Index has no significant effect on poverty rates. This insignificance indicates that although income inequality exists, its impact on poverty in Riau Province has not been evident in the research period. Meanwhile, the Human Development Index (HDI) has a negative and significant effect on poverty rates, with every 1 point increase in HDI can reduce the poverty rate by 0.5371%. This emphasizes the importance of quality education, health, and living standards in alleviating poverty. Simultaneously, these three variables have a significant effect on poverty levels, which shows that poverty alleviation efforts in Riau Province require an integrated approach involving these three factors.

Based on these findings, some suggestions can be given. First, to increase inclusive economic growth, the Riau Provincial Government needs to encourage sectors that can absorb poor workers, such as the agricultural sector, small-medium industry, and creative economy.

Increasing investment and creating quality jobs are also important keys in reducing poverty. Second, although income distribution does not show a significant influence in the model, income inequality still needs to be a concern. Redistribution programs, such as targeted social assistance, increased access to financial services, and progressive tax policies can help create better economic justice. Third, increasing HDI through improving the quality of education, access to health services, and the provision of adequate basic infrastructure is essential to reduce poverty. Skills training programs for the poor can also increase their competitiveness in the job market. Fourth, local governments need to design integrated development policies that cover various sectors to overcome poverty comprehensively. Cooperation between the government, the private sector, and the community is the key to realizing sustainable development.

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