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# The Effect of Fiscal Decentralization, Human Development Index (HDI), and Poverty Rate on Income Disparity in Sumatra Provinces

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**ABSTRACT:** Income disparity is defined as the discrepancy in income distribution between different communities. The existence of high and low income levels can serve as a benchmark for a country, regardless of whether it is classified as developed or developing. The impact of income disparity has the potential to influence the sustainability of economic development at the regional and national levels. High income disparity has a deleterious effect on the political and economic stability of a country. This research employs a descriptive quantitative methodology. This research employs secondary data and panel data regression analysis tools. The data utilized in this study were procured from the Directorate General of Fiscal Balance and the Central Bureau of Statistics of all provinces within the Sumatra region. The research data set includes the Fiscal Balance Fund, the Human Development Index, the percentage of the population living below the poverty line, and the Gini Ratio Index for the past seven years, from 2017 to 2023. The findings of this study indicate that fiscal decentralization and poverty level exert a negative but insignificant influence on income disparity in the Sumatra region provinces. Conversely, the human development index exerts a negative and significant influence on income disparity in the same region.

**KEYWORDS:** Fiscal Income Disparity, Fiscal Desentralization, Human Development Index, Poverty Rate

## I. INTRODUCTION

A common challenge faced by developing countries is income inequality, which refers to the disparity between high-income groups and low-income groups. Additionally, the level of poverty and the number of individuals below the poverty line are significant concerns in these countries. (Wahyuni & Andriyani, 2022). A significant discrepancy in income levels has an adverse effect on the political and economic stability of a nation. It is thus imperative to pursue a range of policies aimed at reducing disparities between regions. (Anshari et al., 2019). These disparities manifest initially in differences in the composition of natural resources and demographic conditions across regions (Irwanto & Noviandari, 2019). As a consequence of these discrepancies, the capacity of a region to enhance the well-being of its inhabitants may vary. Consequently, there are regions that have undergone economic development, while others remain underdeveloped. (Nadya & Syafri, 2019).

In their research, Agustin & Nuryadin (2023) defined income disparity as the difference in income between communities. The existence of high and low income levels can serve as a benchmark for a country, regardless of whether the country is classified as developed or developing. The impact of income disparity has the potential to influence the sustainability of economic development at the regional and national levels. Income disparity in the Sumatra Region Province has the potential to become a significant challenge if not addressed by the government. Failure to address this issue could result in a range of adverse consequences, including population, economic, political, and social issues that could impede the region's development trajectory.
(Hidayat, 2020).

The Gini ratio is the most appropriate measure for assessing income disparity. The Gini Ratio is a numerical indicator that measures disparity between regions, with a range of values from 0 (indicating the greatest equality) to 1 (indicating the greatest inequality) (Todaro & Smith, 2020). The Gini Ratio is classified into three categories: low disparity (0-0,3), moderate disparity (0.3-0.5), and high disparity (>0.5). The Gini Ratio Index for the Sumatra Region Province is illustrated in Figure 1.1 below.

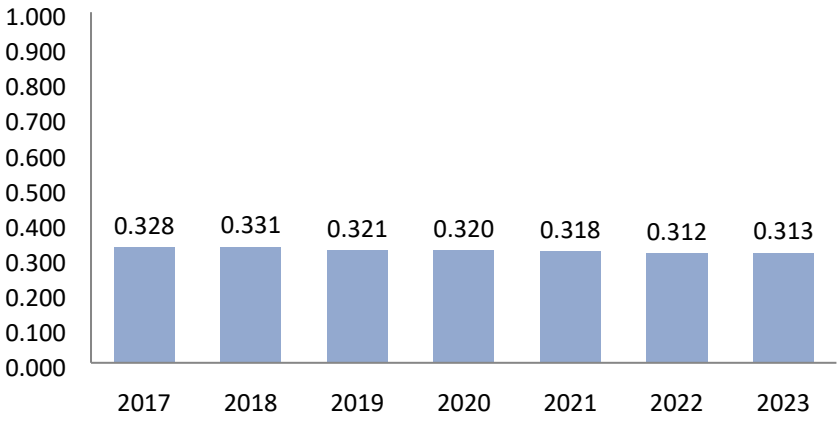


**Figure 1.1 Gini Ratio Index of Sumatra Region Provinces Year 2017-2023**
**Source:** Data processed, 2024

As illustrated in Figure 1.1, the Gini Ratio, a measure of economic disparity, has demonstrated fluctuations in the Sumatra Region Province between 2017 and 2023. The highest disparity rate was observed in 2018, reaching 0.331. The lowest figure was recorded in 2022, at 0.312. In 2023, the Gini Ratio Index exhibited an increase, reaching a value of 0.313. The mean Gini Ratio Index of the Sumatra Region Province, calculated from 2017 to 2023, is 0.320, which falls within the category of moderate disparity. This evidence indicates that the economic growth of the community in the Sumatra Region Province has not been fully equitable, suggesting the persistence of inequality. Income disparities in the Sumatra Region Province exhibit considerable variation on an annual basis. This is due to the fact that the various regions within the province possess differing natural resources and infrastructure, which in turn give rise to discrepancies in income levels. (Ningsih et al., 2023). To mitigate income disparities, the government delegates authority to regional authorities to manage resources and maximize existing economic potential, thereby encouraging economic growth through the implementation of fiscal decentralization in each region. (Wardani et al., 2023).

## II. RESEARCH METHODS

This research method is descriptive and quantitative, which is a metodologhy based on the examination of secondary data and the statistical analysis of numerical data through the use of research tools in order to test the hypothesis (Sugiyono, 2019). The research was conducted in all provinces within the Sumatra region, which encompasses the following provinces the provinces included in this study were Aceh, North Sumatra, West Sumatra, Riau, Jambi, South Sumatra, Bengkulu, Lampung, Bangka Belitung Islands, and Riau Islands. This study employs secondary data and panel data regression analysis tools. The data utilized in this study were sourced from the Directorate General of Fiscal Balance and the Central Bureau of Statistics of all provinces within the Sumatra region.

The research employs two analytical techniques: panel data regression and descriptive statistical analysis. Descriptive statistics are employed to respond to the initial research question, which pertains to the characterization of the degree of disparity as reflected by the Gini Ratio. Panel data regression analysis is employed to address the second research question, which concerns the impact of fiscal decentralization variables, the Human Development Index, the poverty rate, and income disparity in Sumatra region provinces.

Panel data is defined as a combination of time series and cross-sectional data. A time series is a series of observations collected at regular intervals over time. In contrast, cross-sectional data is data collected at a single point in time from a variety of samples (Widodo, 2017). The application of linear regression models entails the utilisation of both cross-sectional and time-series data. So, the equation for this research model is as follows:

$$ID_{it} = \alpha + \beta_{1it}FD_{1it} + \beta_{2it}HDI_{2it} + \beta_3 PR_{3it} + e_{it} \quad \text{.....(1)}$$

Description:

ID : Income Disparity
FD : Fiscal Desentralization
HDI : Human Development Index
PR : Poverty Rate
$\alpha$ : Intercept or constant
i : Cross section data (ten provinces in the Sumatra region)
t : Time series data (2017 to 2023)

$\beta_1, \beta_2, \beta_3$ : Regression Coefficient of Independent Variables $e_{it}$
: Individual error (i) and time error (t)

There are three models that can be used for panel data regression. The three models are the common effect model, the fixed effect model, and the random effect model.

## III. RESULTS AND DISCUSSION

### 1. Panel Data Regression Model Selection A. Chow Test

The Chow Test is a panel data test that is used to determine which model is the most appropriate for a given set of data: the Common Effect Model or the Fixed Effect Model. The results of the Chow Test are presented in the following table.

**Table 3.1 Chow Test Results**

| Effects Test | Statistic | d.f. | Prob. |
|---|---|---|---|
| Cross-section F | 36.381724 | (9,57) | 0.0000 |
| Cross-section Chi-square | 133.610736 | 9 | 0.0000 |

**Source:** Data processed, 2024

As evidenced in Table 3.1, the results of the Chow Test yielded a probability of 0.0000 for the cross-section F, indicating a statistically significant result at the $\alpha = 5$ percent level (0.05). The probability value of 0.0000 is less than the significance level of $\alpha = 0.05$, indicating that the fixed effect model is the most appropriate for the data set.

### B. Hausman Test

The Hausman test is employed to ascertain the optimal model between the fixed effect model and the random effect model. The results of the Hausman test are presented in the following table:

**Table 3.2 Hausman Test Results**

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random | 5.198654 | 3 | 0.1578 |

Source: Data processed, 2024

As evidenced in Table 3.2, the results of the Hausman Test yield a probability value of 0.1578, which is greater than 0.05. This suggests that the Random Effect Model is the optimal choice for the model decision, as determined by the Hausman Test results.

### C. Uji Lagrange Multiplier Test

Lagrange Multiplier (LM) test to determine the best model between the Common Effect Model (CEM) and the Random Effect Model (REM). The following Lagrange Multiplier (LM) Test Results in this study can be seen in the following table:

**Table 3.3 Lagrange Multiplier Test Results**

| | Test Hypothesis | | |
|---|---|---|---|
| | Cross-section | Time | Both |
| Breusch-Pagan | 98.62868 | 0.424522 | 99.05320 |
| | (0.0000) | (0.5147) | (0.0000) |
| Honda | 9.931197 | 0.651554 | 7.483135 |
| | (0.0000) | (0.2573) | (0.0000) |
| King-Wu | 9.931197 | 0.651554 | 6.785732 |
| | (0.0000) | (0.2573) | (0.0000) |

**Source:** Data processed, 2024

The results of the Lagrange Multiplier (LM) test indicate that the probability value associated with the Breusch-Pagan cross-section is 0.0000. The probability value is less than $\alpha = 0.05$, indicating that the Random Effect Model is the optimal choice for the analysis.

**2. Classical Assumption Test**

The classical assumption test stages are divided into three, namely normality test, multicollinearity test and heterosceadsticity test.

**A. Normality Test**

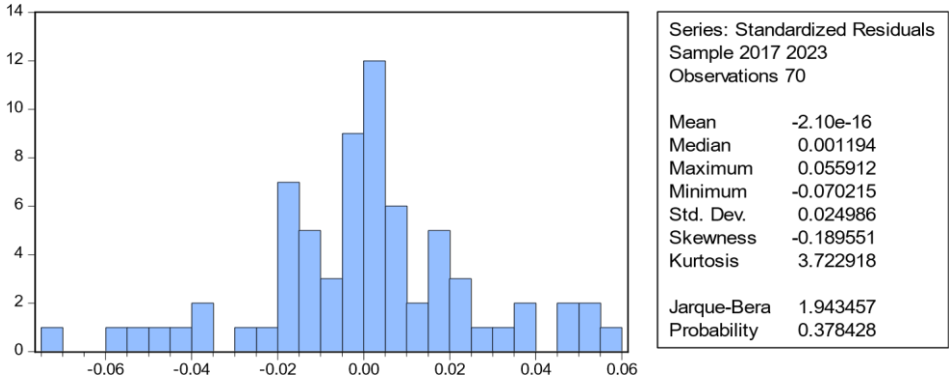


**Figure 3.1 Normality Test Results**

**Source:** Data processed, 2024

As illustrated in Figure 3.1, the probability value of the normality test results is 0.378428, which is greater than 0.05. Therefore, it can be concluded that the data in this study are normally distributed.

**B. Multicollinearity Test**

**Table 3.4 Multicollinearity Test Results**

| | FD | HDI | PR |
|---|---|---|---|
| FD | 1.000000 | -0.233436 | 0.229756 |
| HDI | -0.233436 | 1.000000 | -0.484227 |
| PR | 0.229756 | -0.484227 | 1.000000 |

**Source:** Data processed, 2024

As illustrated in Table 3.4, the correlation coefficient between FD and HDI is -0.233436, which falls below the 0.90 threshold for a strong correlation. Similarly, the correlation coefficients between FD and PR and between HDI and PR are 0.229756 and 0.484227, respectively, both of which are also below the 0.90 threshold. Therefore, it can be concluded that this study is free of multicollinearity.

**C. Heteroscedasticity Test**

**Table 3.5 Heteroscedasticity Test Results**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.006732 | 0.024021 | 0.280271 | 0.7801 |
| FD | -7.97E-14 | 5.69E-14 | -1.401781 | 0.1657 |
| HDI | 1.86E-05 | 0.000322 | 0.057837 | 0.9541 |
| PR | -0.000176 | 0.000151 | -1.166345 | 0.2477 |

**Source:** Data processed, 2024

Based on table 3.5, shows that the probability value of each variable > 0.05, so it can be concluded that this study does not occur heteroscedasticity.

**3. Panel Data Regression Equation Model**

Based on the results of the panel data regression model estimation test, the Chow Test and the Hausman Test that have been carried out, can be concluded that the best and suitable model for use in this research is the Random Effect Model (REM).

**Table 3.6 Random Effect Model (REM) Analysis Results**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.668823 | 0.127442 | 5.248045 | 0.0000 |
| FD | -0,000642 | 0,000642 | -0.102825 | 0.9184 |
| HDI | -0.005169 | 0.001624 | -3.182444 | 0.0022 |
| PR | 0.002528 | 0.001854 | 1.363210 | 0.1774 |
| | Weighted Statistics | | | |
| R-squared | 0.307476 | Mean dependent var | | 0.048282 |
| Adjusted R-squared | 0.275997 | S.D. dependent var | | 0.010718 |
| S.E. of regression | 0.009120 | Sum squared resid | | 0.005489 |
| F-statistic | 9.767844 | Durbin-Watson stat | | 1.112779 |
| Prob(F-statistic) | 0.000020 | | | |
| | Unweighted Statistics | | | |
| R-squared | -0.013470 | Mean dependent var | | 0.320386 |
| Sum squared resid | 0.043077 | Durbin-Watson stat | | 0.141804 |

**Source:** Data processed, 2024

The results of the panel data regression model in Table 3.6, the equation is as follows:

$ID_{it} = \alpha - \beta_1 FD_{it} - \beta_2 HDI_{it} + \beta_3 PR_{it}$ .....(2)

$ID = 0.668823 - 0.000642 FD_{it} - 0.005169 HDI_{it} + 0.002528 PL_{it}$.....(3)

The explanation of the above equation can be explained as follows:

A. The regression coefficient of Income Disparity is 0.668823 percent. If the value of Fiscal Decentralization, Human Development Index, and Poverty Level is 0 (zero), then the Income Disparity variable is 0.668823 percent
B. The regression coefficient of Fiscal Decentralization is -0.000642 percent. The value of Fiscal Decentralization has a negative and insignificant effect. If the value of Fiscal Decentralization increases by 1 (one) percent, it will reduce the value of Income Disparity by 0.000642 percent.
C. The Human Development Index regression coefficient is -0.005169 percent. The value of the Human Development Index has a negative and insignificant effect. If the value of the Human Development Index increases by 1 (one) percent, it will reduce Income Disparity by 0.005169 percent.
D. The Poverty Rate Coefficient is 0.002528 percent. The Poverty rate value has a positive and insignificant effect. If the Poverty rate value increases by 1 (one) percent, it will increase the Income Disparity value by 0.002528 percent.

**4. HYPOTHESIS TEST**

The hypothesis test includes the t-test, and the coefficient of determination ($R^2$). The test is explained as follows: **A. t-statistic Test**

**Table 3.7 Result of t test**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.668823 | 0.127442 | 5.248045 | 0.0000 |
| FD | -0,000642 | 0,000642 | -0.102825 | 0.9184 |
| HDI | -0.005169 | 0.001624 | -3.182444 | 0.0022 |
| PR | 0.002528 | 0.001854 | 1.363210 | 0.1774 |

**Source:** Data processed, 2024

Based on table 3.7, the results of the t test or partial test of each variable, the analysis of the t test can be described as follows:

1. $H_1$: There is a negative and insignificant effect of Fiscal Decentralization on Income Disparity in Sumatra Region Provinces.
   a. The value of t-count = -0.102825 indicates that the greater the value of Fiscal Decentralization, the lower the Income Disparity in Sumatra Region Provinces.

b. The t-table value with an α (0.05) or 5 percent and the degree of freedom (df) = (n-k) or (70-4) = 66, then the t-table is obtained at (1.66827).
c. The value of t-count < t-table (-0.102825 < 1.66827) means that $H_0$ is accepted $H_1$ is rejected.
d. The probability of Fiscal Decentralization is 0.9184 > α (0.05) then $H_0$ is accepted and $H_1$ is rejected with a negative coefficient direction.
e. Conclusion: Fiscal Decentralization has a negative and insignificant effect on Income Disparity, meaning that if Fiscal Decentralization increases, then Income Disparity decreases.

2. $H_2$: There is a negative and significant effect of Human Development Index on Income Disparity in Sumatra Region Provinces.
   a. The value of t-count = -3.182444 indicates that the greater the value of the Human Development Index, the lower the Income Disparity in the Sumatra Region Provinces.
   b. The t-table value with an α (0.05) or 5 percent and the degree of freedom (df) = (n-k) or (70-4) = 66, then the t-table is obtained at (1.66827).
   c. The value of t-count < t-table (-3.182444 < 1.66827) means that $H_0$ is accepted $H_2$ is rejected.
   d. The probability of Human Development Index is 0.0022 < α (0.05) so $H_0$ is rejected and $H_2$ is accepted with a negative coefficient direction.
   e. Conclusion: The Human Development Index has a negative and significant effect on Income Disparity in Sumatra Region Provinces, meaning that if the Human Development Index increases, then Income Disparity also decreases.
3. $H_3$: There is a negative and insignificant effect of Poverty Level on Income Disparity in Sumatra Region Provinces.
   a. The value of t-count = 0.002528 indicates that the greater the value of the Poverty Level, the higher the Income Disparity in the Sumatra Region Provinces.
   b. The t-table value with an α (0.05) or 5 percent and the degree of freedom (df) = (n-k) or (70-4) = 66, then the t-table is obtained at (1.66827).
   c. The value of t-count < t-table (0.002528 < 1.66827) means that $H_0$ is accepted $H_3$ is rejected.
   d. The probability of Poverty Level is 0.1774 > α (0.05) then $H_0$ is accepted and $H_3$ is rejected with a positive coefficient direction.
   e. Conclusion: Poverty Level has a negative and insignificant effect on Income Disparity in Sumatra Region Provinces.

**B. Determinant Coefficient Test ($R^2$)**

**Table 3.8 Adjusted Determination Coefficient Test ($R^2$)**

| | | | |
|---|---|---|---|
| R-squared | 0.307476 | Mean dependent var | 0.048282 |
| Adjusted R-squared | 0.275997 | S.D. dependent var | 0.010718 |

**Source:** Data processed, 2024

As indicated in Table 3.8, the outcome of the Adjusted $R^2$ Determination Coefficient Test is 0.275997, representing a 27.60 percent correlation. This figure demonstrates that the variation in the fiscal decentralization, human development index, and poverty level variables on income disparity is capable of explaining this study by 0.275997, or 27.60 percent. The remaining portion is influenced by variables that are not included in this study.

**5. DISCUSSION**

A. The Effect of Fiscal Decentralization on Income Disparity

The coefficient index value of fiscal decentralization (t-count) is less than the critical value (t-table), indicating a statistically insignificant effect. Furthermore, the probability value of fiscal decentralization is greater than the alpha level (α), confirming the rejection of the alternative hypothesis ($H_1$) and the acceptance of the null hypothesis ($H_0$). This implies that the coefficient is negative and statistically insignificant. It can thus be concluded that fiscal decentralization exerts a negative and insignificant effect on income disparity in the Sumatra region's provinces. This indicates that an increase in fiscal decentralization will result in a reduction in income disparity.

B. The Effect of Human Development Index on Income Disparity

This study examines the relationship between the Human Development Index (HDI) and income disparity in the Sumatra region. Provinces are classified based on the coefficient value of the HDI variable, which yielded a t-count of -3.182444 and a ttable value of 1.66827. Subsequently, with a probability value of the Human Development Index of 0.0022 < α (0.05), it can be concluded that the null hypothesis ($H_0$) is rejected and the alternative hypothesis ($H_1$) is accepted, with a negative coefficient direction. In light of

these findings, it can be concluded that the Human Development Index exerts a negative and statistically significant influence on income disparity in the Sumatra region provinces.

C. The Effect of Poverty Level on Income Disparity

The effect of poverty level on income disparity in the Sumatra region provinces is contingent upon the coefficient value of the poverty level variable. Upon obtaining the t-count value, it was determined that it was less than the t-table value, which was 1.363210 < 1.66827. Consequently, with a probability value of poverty level of 0.1774 > α (0.05), it can be inferred that H0 is accepted and $H_1$ is rejected with a positive coefficient direction. It can thus be concluded that the effect of poverty level on income disparity in the Sumatra region is negative but insignificant.

## IV. CONCLUSIONS

Based on the results of the discussion and analysis of research on the Effect of Fiscal Decentralization, Human Development Index, and Poverty Level on Income Disparity in Sumatra Region Provinces, the following conclusions are obtained:

1. There is a negative and insignificant effect of Fiscal Decentralization on Income Disparity in Sumatra Region Provinces.
2. There is a negative and significant effect of Human Development Index on Income Disparity in Sumatra Region Provinces
3. There is a negative and insignificant effect of Poverty Level on Income Disparity in Sumatra Region Provinces.

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