

Research Article

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The Effect of Fiscal Decentralization on Economic Growth: Panel Data of 16 Provinces in Sumatra and Java Island

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Abstract: *This study aims to examine the effect of fiscal decentralization with initial growth as a control variable on economic growth in 16 provinces on the island of Sumatra and Java. The study used panel data from 2012 to 2022. This study used panel data regression analysis techniques. In this study, the model chosen was CEM with an Ordinary Least Squares (OLS) approach. The results of this study show that there is a significant influence of the level of fiscal decentralization and initial growth on per capita economic growth on the island of Sumatra and Java. Simultaneously, the degree of fiscal decentralization and initial growth affect per capita economic growth on the island of Sumatra.*

Keywords: *fiscal decentralization, initial economic growth, economic growth.*

Introduction

Economic growth measured through per capita growth can overcome the characteristic differences that arise in each region, namely in the form of population. In addition, in analyzing economic growth according to Levine & Renelt (1992), a control variable is required in the form of an initial growth variable. Initial growth is economic growth in the year before the research year which becomes capital to carry out growth in the following year. Initial growth will be able to reflect the development of economic factors in the future. Through initial growth the speed of convergence between regions can be seen.

Per capita economic growth in provinces on the island of Sumatra and Java from 2012 to 2022 fluctuates and tends to slow. If viewed further, on the island of Sumatra in 2012 it fell to 4.05 percent and the decline continued to occur until 2020, which was -0.33 percent, but per capita economic growth increased again in 2021 and 2022. Per capita economic growth in Java Island in 2012 was 4.84 percent, in the following year per capita economic growth tended to fluctuate until in 2020 it was -1.56 percent then in 2021-2022 it increased again. In 2022, per capita economic growth on the islands of Sumatra and Java of 3.10 and 4.37 is still lower than in 2012 (Badan Pusat Statistik, 2023). The government implements two policies to encourage and stabilize economic growth, namely monetary policy dan fiscal policy. Fiscal policy is carried out to restore the economy and strengthen reforms in order to get out of the middleincome trap (Hayati, 2022). Through fiscal decentralization, a region is given the freedom to independently manage its region (Sofilda et al., 2023).

The pioneer of fiscal decentralization studies Tiebout (1956), posited that fiscal decentralization is the granting of delegation of power from the central government to local governments. Through decentralization, local governments can create more efficient public services that can boost economic growth. Fiscal decentralization applied to the regions must be followed by the financial capabilities of each region. According to Undang-Undang Republik Indonesia Nomor 23 Tahun 2014 About Local Government, Decentralization is carried out to realize the effectiveness of local government administration, improve

well-being and quality of public services, improve the quality of government governance and competitiveness and maintain regional privileges in terms of customs, traditions and culture. The law also clarifies that the sources of funding for local governments in the implementation of decentralization are local original revenues and equalization funds in the form of physical and non-physical special allocation funds, profit sharing funds, and general allocation funds as well as valid regional loans and other revenues. Local original revenue can increase economic growth which is reflected through the ability to manage local government expenditures in spending (Kusuma, 2016).

The delegation of power from the central government handed over to regional governments formed in regional autonomy aims to improve public services, accelerate economic development to realize community welfare, and accelerate the democratization process at the district and city levels and public accountability can be created in each region (Rondinelli, 1981). Oates (1972), Develop a theory of fiscal decentralization through the hypothesis that there is a trade-off between the responsiveness of local governments to the capacity and desires of local governments. This shows that if local governments gain greater capacity, better public services will be provided by local governments to the community. Fiscal decentralization is a research indicator in an economic perspective from the side of government revenue. Nominal government revenue has a real value that is used as government expenditure. This is contained in Wagner's law, Wagner suggests that relatively government spending gets higher when per capita income increases. The growing economy causes the role of the government to be greater because the government must regulate everything that arises in society.

Fiscal decentralization can boost economic growth through economic efficiency in the government spending sector, but fiscal decentralization can interfere with economic growth because it can cause macroeconomic instability, besides that fiscal decentralization has different effects on developed and developing countries (World Bank, 1997).

Previous research in the 1995-2000 decentralization negatively impacts the expenditure side and income side on economic growth. In that year the role of the central government still dominated in controlling local government budgets. In the 2001-2004 study, fiscal decentralization in terms of expenditure and revenue had an effect in encouraging economic growth (Kharisma, 2013). In line with research conducted by Yushkov (2015), Decentralization of spending negatively affects economic growth and Jin & Rider (2020), also argues that in the short run decentralization of spending has a significant impact but has a negative relationship to economic growth in India and China whereas in the long run economic growth has a significant influence and has a positive relationship in China but not in India.

But it is different from research Sofilda et al. (2023), Regional financial capabilities can be increased through decentralization policies. Regions that have low financial capacity still need funding assistance from the central government. The results of research conducted in Indonesia found that fiscal decentralization has a negative influence on economic growth in regions that have a level of independence below 50 percent and a positive effect on countries with a level of independence above 50 percent. On the contrary, in research Saputra et al. (2012), The negative influence on economic growth.

But in research Ginting et al. (2019), contains the conclusion that fiscal decentralization in all districts/cities in Indonesia has a significant positive influence. Another study conducted in Jambi Province revealed that there is a direct impact on per capita economic growth due to the freedom of the government in a region to manage and manage its territory according to the conditions and needs and expectations of the community (Adipura et al., 2022). Different results of research in West Sumatra Province in 2016-2020 showed that there was a positive relationship with economic growth but did not have a significant effect

(Fitria et al., 2023). Through the method Geographically Weighted Regression (GWR) Permai et al. (2021), draw conclusions that economic performance is positively and significantly affected by fiscal decentralization.

Research on fiscal decentralization has been debated. In the opinion of some, through fiscal decentralization, revenue management can occur in a region and the quality of public services can increase so as to encourage economic growth which in turn will have an impact on people's welfare. However, not all economists agree with this view. Some economists also argue that slowing economic growth results from fiscal decentralization. Fiscal decentralization aims to facilitate and facilitate decision and policy making in a region (Bojanic, 2018). But the impact of decentralization remains unclear and its impact is debatable.

Previous research on the effect of fiscal decentralization on economic growth has shown different results. In this study want to see the effect of fiscal decentralization measured through the ratio of local original income to regional income to per capita economic growth on the island of Sumatra and Java with initial economic growth as a control variabel.

Method

Scope of Research and Data Sources

This study used panel data. The study was conducted in 16 provinces on the islands of Sumatra and Java. Cross section data is in the form of 16 provinces in Sumatra and Java in the 2012-2022 period while time series data is in the form of 2012-2022 period. The variables used in this study are economic growth, degree of fiscal decentralization, and initial economic growth. The data in this study was sourced from the Central Statistics Agency and the Directorate General of Financial Balance of the Ministry of Finance.

Operational Definition

Economic Growth is seen using the indicator of Economic Growth per capita measured through GRDP per capita year t minus GRDP per capita $t-1$ divided by GRDP per capita $t-1$. $t-1$ is the year before the year of study. The fiscal decentralization rate indicator is measured through the ratio of local original income to regional income and initial growth is economic growth before the study year, which is 2011-2021.

Table 1. Operational Definition

No	Variabel	Symbol	Unit
1	Economic Growth	EG	Percent
2	Degree of Fiscal Decentralization	DD	Percent
3	Initial Economic Growth	EG _{t-1}	Percent

Data Analysis

The panel data regression equation with the OLS approach formed in this study is as follows:

$$EG_{it} = \beta_0 + \beta_1 DD_{it} + \beta_2 EG_{it-1} + e_{it}$$

Where:

EG_{it} = Economic Growth (percent)

DD_{it} = Degree of Fiscal Decentralization (percent)

EG_{t-1} = Initial Growth (percent)

- i = Individual number (*cross section*)
 t = Period (*time series*)
 β_0 = Konstanta
 β_1, β_2 = Koefisien regresi
 e_t = Error Term

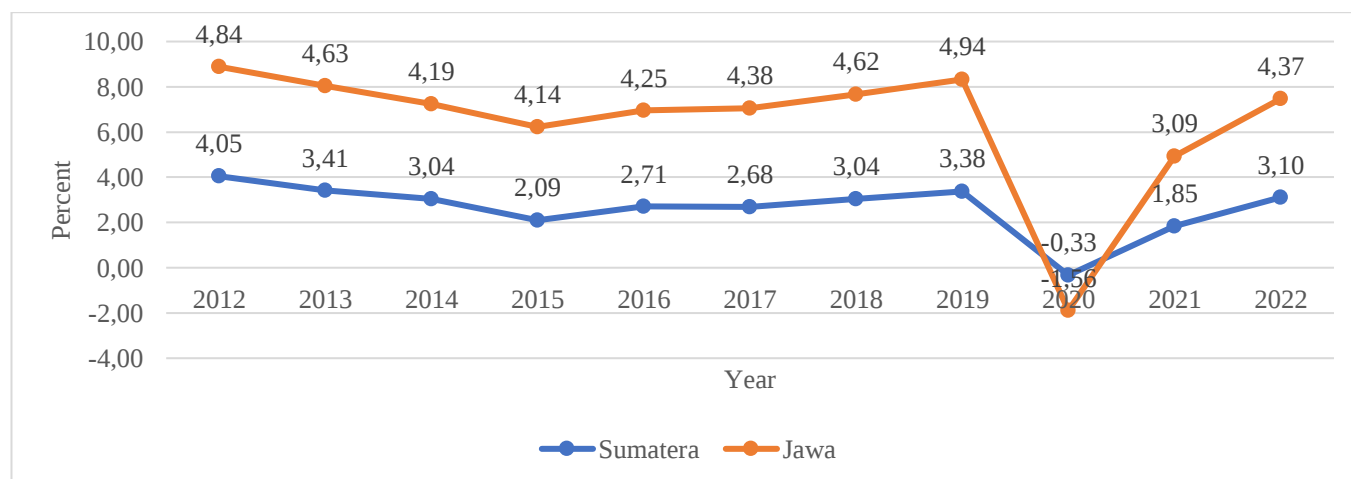
The panel data regression estimation stage is carried out by determining the best model to be used, the model includes three models, including a simple model combined with time series and cross-section data or Common Effect Model (CEM), a model with different intercept assumptions or Fixed Effect Model (FEM), and a model to overcome error terms or Random Effect Model (REM). Model selection is carried out through three tests, including the Chow test, Hausman test and Lagrange Multiplier (LM) test.

Furthermore, a classical assumption test was carried out to prove that the model did not have a classical assumption problem, namely there was no heteroscedasticity, no autocorrelation, and no multicollinearity, and a hypothesis test was carried out, namely the t-statistical test and the F-statistik test also the coefficient of determination test (R²).

Results and Discussion

Review of Per-Capita Economic Growth and Degrees of Fiscal Decentralization

Per Capita Economic Growth is an indicator that describes changes in the average income per individual in a region. Figure 1 shows the average per capita economic growth on the island of Sumatra and Java in 2012-2022.



Source: Badan Pusat Statistik, 2023

Figure 1. Trends of Economic Growth per Capita Sumatra and Java Island 2012-2022

The trend of per capita economic growth in Sumatra Island fluctuates and tends to decline. In 2012 the per capita economic growth of Sumatra Island amounted to 4.05 percent and Java Island amounted 4.84 percent. Per capita economic growth is likely to experience a slowdown that is exacerbated in 2020. Per capita economic growth in 2020 was -0.33 percent on Sumatra Island and -1.56 on Java Island, but per capita economic growth increased again in 2021 and 2022. In 2020, the COVID-19 pandemic that hit all countries caused a significant decline in economic growth.

However, table 2 shows the level of fiscal decentralization, which is a measure of a region's financial ability to finance expenditures in a region in each province on the island of Sumatra, ranging from 16.10 percent to 69.19 percent.

Table 2. Average Degree of Fiscal Decentralization in Sumatra and Java Island 2012-2022

Province	Average degree of fiscal decentralization (percent)
Aceh	16.10
North Sumatra	50.11
West Sumatra	40.86
Riau	43.02
Jambi	38.27
South Sumatra	39.45
Bengkulu	30.29
Lampung	44.53
Kep. Bangka Belitung	31.75
Kep. Riau	35.44
Banten	63.92
Jakarta	69.19
West Java	60.98
Central Java	58.89
Yogyakarta	40.72
East Java	62.12

Source: DJPK Kemenkeu, 2023 data processed

According to Halim (2004), There are 6 categories that can interpret the degree of fiscal decentralization, these categories are as follows:

Table 3. Categories Degrees of Fiscal Decentralization

Degree of Fiscal Decentralization (in percent)	Category
0.00 - 10.00	Very Lacking
10.01 - 20.00	Less
20.01 - 30.00	Intermediate
30.01 - 40.00	sufficient
40.01 - 50.00	Good
> 50.00	Excellent

Source: Halim, 2004

From tables 1 and 2, it is known that provinces with Excellent financial capability categories are Jakarta Province, Banten Province, East Java Province, West Java Province, Central Java Province, and North Sumatra Province. Good financial capability categories Riau Province, Lampung Province, West Sumatra Province, and Yogyakarta Province. South Sumatra Province, Jambi Province, Kep. Riau Province, Kep. Bangka Belitung Province, and Bengkulu Province, are included in the category of sufficient financial

capacity to finance their regional expenditures. Only one province on the island of Sumatra with less financial capacity to finance its regional expenditures is Aceh Province.

Best Model Selection

Before estimating the data, it is important to first conduct testing to select the best model that will be used in research and can answer the research objectives.

Table 4. Best Model Selection Test Output

	Summary Test	Probability	Results
Chow test	Cross-section F	0.2924	CEM
	Cross-section Chi-Sq	0.2282	
Hausman test	Cross-section Random	0.0002	FEM
Lagrange Multiplier test	Breusch-Pagam	0.5048	CEM

The Chow test is conducted to determine the choice of CEM or FEM as the best model. In the chow test if the significance level of the Probability $<$ is 0.05, then the model chosen is FEM and vice versa. The probability number is $0.2924 >$ the significance level is 0.05 so that the CEM is chosen.

The Hausman test is conducted to determine the choice of REM or FEM model as the best model. In the Hausman test if the significance level $<$ Probability is 0.05, then FEM is chosen and vice versa. The probability number is $0.0002 <$ the significance level is 0.05 so that the FEM is selected.

The LM test conducted to determine the choice of CEM or REM model selected as the best model. In the Lagrange Multiplier test if the significance level of Probability $<$ is 0.05, then REM is chosen and vice versa. The probability number is $0.5048 >$ a significance level of 0.05 so that the CEM is chosen. Through model selection testing, the CEM was selected as the best model.

Classical Assumption Testing

In this study for the detection of multicollinearity using the correlation method. According to the correlation method, the decision regarding the absence of multicollinearity problems in the model if the correlation value is below 0.85, if the value is more than 0.85, indicates that there is a multicollinearity problem.

Table 5. Multicollinearity Test Results

	DD	EGt-1
DD	1.0000	0.2605
EGt-1	0.2605	1.0000

The correlation value of DD and PET1 variables is 0.2605 below 0.85, so there is no multicollinearity.

The heteroskedasticity test in this study used the white method. The decision-making criterion in the heteroscedasticity test is that if the statistical Chi-Square $<$ the Chi-Square table, then there is no heterokedasticity.

Table 6. Heteroskedasticity Test Results

Observasi	R-square	Chi-Sq. stat.	d.f.	Chi-Sq. tabel.
176	0.018148	3.1940	2	5.9915

The statistical Chi-Square value is $3.1940 < \text{the Chi-Square table is } 5.9915$, hence there is no heterokedasticity.

Autocorrelation test in this study using Breusch-Godfrey method. The decision-making criterion in the heteroscedasticity test is that if the statistical Chi-Square $< \text{the Chi-Square table}$, then there is no autocorrelation.

Table 7. Autocorrelation Test Results

Observasi	R-square	Chi-Sq. stat.	d.f.	Chi-Sq. tabel.
144	0.008392	1.2084	2	5.9915

The statistical Chi-Square value is $1.2084 < \text{the Chi-Square table is } 5.9915$, hence there is no heterokedasticity.

Through testing the calcic assumption, it is known that the calcic assumption problem does not exist in this model.

Panel Data Regression Estimation Results with OLS approach

Table 8. Panel Data Regression Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.63778	0.51423	1.24027	0.2166
DD	0.03793	0.01098	3.45343	0.0007
PET1	0.22761	0.07118	3.19768	0.0016
R-squared	0.14752	F-statistic		14.9682
Adjusted R-squared	0.13766	Prob(F-statistic)		0.0000

Note: The dependent variable is GRDP per capita growth (EG)

Based on Table 8, regarding the acquisition of panel data, the estimation of regression results shows that there is a significant positive influence of the degree of fiscal decentralization (DD) and initial growth (PET1) on per capita economic growth. An increased degree of fiscal decentralization (DD) of one percent would increase per capita economic growth by 0.038 percent, *ceteris paribus*. Similarly, with initial growth increasing by one percent, this will provide an increase in per capita economic growth of 0.228 percent, *ceteris pasribus*. Simultaneously, both variables, fiscal decentralization and initial growth, have a significant influence on per capita economic growth. The R-Square coefficient value of 0.1475 or 14.75 percent means that the variable degree of fiscal decentralization and initial growth has an effect of 14.75 percent, the rest is influenced by other variables that were not included in this study. This is explained in the study Ginting et al. (2019) that to increase economic growth, fiscal decentralization is needed, but relying solely on fiscal decentralization is not enough.

Discussion

In this study, through the panel data regression method, it is known the degree of influence of fiscal decentralization and the influence of initial growth on per capita economic growth on Sumatra Island and Java Island with a research period range of 2012-2022. In this study, the Common Effect Model was determined as the selected model through testing the selection of models that had been carried out. Based

on the results of the study, it was found that there was a significant positive influence of the degree of fiscal decentralization (DD) and prime economic growth (PET1) on per capita economic growth on Sumatra Island and Java Island in 2012-2022. Ginting et al. (2019) and Adipura et al. (2022), supporting this research where in his research on fiscal decentralization it is explained that there is a significant influence and positive relationship to economic growth. This is also supported by research Jin & Rider (2020), that in the long run China's economic growth is positively and significantly affected by the country's fiscal decentralization policy. In addition, these results are also supported by Suharyono (2020), that the ratio of local original income to total regional income directly positively affects economic growth. District revenue will be used as regional production directed to development in each area.

Oates (1972), suggests that increased efficiency of public services resulting from fiscal decentralization can stimulate economic growth. The implementation of fiscal decentralization can boost economic growth. Through fiscal decentralization in the form of granting authority to local governments to regulate and carry out regional activities more precisely because local governments are more familiar with and aware of their regional conditions so that the allocation of regional revenues for regional expenditures can be used more effectively and efficiently for regional development and community welfare. Fiscal decentralization policy can bring the government closer to the community so that efficiency in the economy through a decentralized government system can improve the economy (Suwandi & Tahar, 2015).

Good financial capabilities can help the government to respond well to critical regional conditions. The government can allocate budgets to sectors that are in accordance with the needs of their regions, such as allocations for education, health, and infrastructure that aim to improve community capacity and improve public services that can encourage economic growth.

In addition, the positive value shown from the initial growth variable coefficient indicates that there is a convergence of economic growth on the island of Sumatra. Convergence means that areas with low growth rates tend to catch up with other regions.

Conclusion

According to the results of the study, the degree of fiscal decentralization can boost Economic Growth. Good financial capacity in a region can stimulate economic growth through revenues that will be allocated as regional expenditures which are then directed to development carried out in an area such as the development of public services. Therefore, the government is expected to use regional revenues as well as possible, ensuring that every revenue received by regions can be utilized and allocated according to regional needs.

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