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Analysis of Fiscal Decentralization Impact on the Human Development Index (HDI) and Poverty in Indonesia: Study Case South Sumatra Province

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Abstract- Fiscal decentralization in South Sumatra seems to have been going on for more than two decades but in terms of fiscal independence it has not yet been implemented properly. The realization of regional income and capital expenditure of South Sumatra is third ranked of all provinces on the Sumatra. However, the Human Development Index (IPM) and Poverty in South Sumatra are still in the poor category. This study purpose to the factors of fiscal decentralization that affect the human development index (HDI) and poverty in South Sumatra. The data used in this study is secondary data from 15 districts/cities in South Sumatra Province with the period 2013 – 2020. This study uses panel data regression analysis with the Fix Effect Model (FEM) method. Based on the results of data analysis shows that the degrees of fiscal decentralization, GRDP, educational facilities, and health facilities have significant effect the human development index (HDI) in South Sumatra Province. The variables of capital expenditure, GRDP, open unemployment rate, and Gini ratio have a significant effect on poverty in South Sumatra Province.

Keywords- Capital expenditure, fiscal desentralization, HDI, panel data, poverty.

I. INTRODUCTION

Indonesia is a country formed from the ranks of islands. With some regions that have advantages or potential to improve the economy of their regions. The increase in regional potential began to be carried out with the issuance of a fiscal decentralization policy. With fiscal decentralization, it is hoped that macroeconomic stability will be carried out and can improve the economy of a region. [1]

The implementation of regional autonomy certainly has the aim that autonomous regions are able or independent in financing related to regional government activities, and the dependence on the central government is getting smaller. The level of regional fiscal independence can be studied by looking at the magnitude of a region's fiscal decentralization, where the measurement of regional fiscal independence uses a degree of fiscal autonomy or a degree of fiscal decentralization. The degree of Fiscal decentralization (DF) shows how much the central government intervenes in the implementation of regional development and shows the level of readiness of local governments in the implementation of regional autonomy [2].

This is illustrated by the contribution of the tourism sector to the economy in West Java. Referring to Central Bureau of Statistics data, South Sumatra Province is one of the provinces that have high regional income realization and is in third place under North Sumatra Province and Aceh Province. In 2020, the realization of South Sumatra's regional revenue was 39.246 trillion rupiah. In addition, the expenditure side of South Sumatra Province in 2020 reached 9.51 trillion rupiah. This value is a high enough value to be issued by local governments in improving the regional economy. In addition to looking at the realization of regional income and expenditure, efforts to improve public welfare in conditions of fiscal decentralization need attention from other levels of welfare. The welfare of the community can be shown by the human development index (HDI) and the level of poverty in the area.

The main objectives of the government in order to improve the quality of Human Resources, namely: intellectual improvement, physical improvement, and economic capabilities. Intellectual improvement can be seen by the large number of participations at the school level. The large number of people who feel that schooling means reducing the number of illiterates which makes it one of the indicators of intellectual improvement. Health can also show the quality of human resources, the number of people affected by the disease means that it shows a bad human resource.

Apart from the HDI value, one of the factors of community welfare is poverty. Poverty is an individual or society becoming unable to meet basic needs in every

aspect of life [3]. Low income levels and causing lack of money are the main problems of the poor, individuals/poor people become powerless in determining their way of life, including due to low levels of health, low education, unfair legal treatment, and easy treatment of crimes [4]. This paper will analyze the relationship and impact of fiscal decentralization on HDI and poverty levels in South Sumatera Province.

II. LITERATURE REVIEW

The research conducted by Pambudi used a data panel whose research began from 2002 to 2006 using 16 districts and 6 cities in West Java. It shows that fiscal decentralization affects the Human Development Index in terms of regional revenue variables such as taxes and levies [5].

The journal created by Soleh and Ardilla on the role of fiscal decentralization on economic growth, human development index, and direct and indirect labor absorption that occurred in Jambi City for the period 2007-2016. The average degree of fiscal decentralization in Jambi City is 12.11 percent and is included in the less criteria. The negative and insignificant influence of the degree of fiscal decentralization on economic growth in Jambi City. The degree of fiscal decentralization has a positive and insignificant effect on HDI while on positive and significant employment [6].

Corroborating this research, Hanif *et al* [7] conducted using panel data from 15 developing countries from 2000-2015. The results of the test that the developing federal states resulting from income from taxes and decentralization of regional expenditures have a positive as well as significant impact on economic growth and then the impact of fiscal decentralization on economic growth depends on the level of corruption and quality of state institutions.

Usman and Mita's research [8] is related to the influence of population, economic growth and unemployment on poverty in Riau Islands Province with the period 2007 – 2016. Multiple linear regression analysis is the method used in this study. The estimation results show that the population has a negative and significant influence, economic growth has a positive and significant influence on poverty in the Riau Islands Province. While unemployment has no significant effect on poverty in Riau Islands Province.

III. RESEARCH METHODOLOGY

This study uses secondary data in the form of panel data which is a combination of time series and cross section data. The cross section data used is data from districts / cities in South Sumatera while the time series data is annual data from 2013-2020. The data sources used in this study were obtained from Central Bureau of Statistic (BPS). The analysis in this study was carried out using Microsoft Excel and Eviews 10.

Table 1. Variables and Data Sources

No	Variables	Data used	Source
1	Poverty	Poverty rate (percent)	Central Bureau of Statistic
2	Hdi	Human Development Indeks	Central Bureau of Statistic
3	Df	Degree of fiscal decentralization (percent)	Central Bureau of Statistic
4	Capital	Capital Expenditure (rupiah)	Central Bureau of Statistic
5	Edu	Educational facilities (units)	Central Bureau of Statistic
6	Health	health facilities (units)	Central Bureau of Statistic
7	Gdrp	Gross Domestic Regional Product (rupiah)	Central Bureau of Statistic
8	Gini	Gini ratio (0-1)	Central Bureau of Statistic
9	Tpt	Open unemployment rate (percent)	Central Bureau of Statistic

The analysis method used panel data regression. Panel data regression is carried out by performing several stages of analysis. Panel data regression analysis uses three test methods to select the best model. In this study, it was determined that the method used was ordinary least square (OLS) with a fix effect model.

The research model used:
Fiscal decentralization model to HDI:

$$HDI_{it} = \beta_0 + \beta_1 DF_{it} + \beta_2 LN\_CAPITAL_{it} + \beta_3\ LN\_GDRP_{it} + \beta_4 LN\_HEALTH_{it} + \beta_5\ LN\_EDU_{it} + \varepsilon$$

Fiscal decentralization model to poverty:

$$POVERTY_{it} = \beta_0 + \beta_1 DF_{it} + \beta_2 LN\_CAPITALI_{it} + \beta_3\ LN\_GDRP_{it} + \beta_4 GINI_{it} + \beta_5 TPT_{it} + \varepsilon$$

Description:

β_0	=	Constant (intercept)
β_1 - β_4	=	Parameters of each independent variable
$POVERTY_{it}$	=	Poverty rate (percent) of district i in year t
DF_{it}	=	Degree of fiscal decentralization of district/city i in year t
$LN\_CAPITAL_{it}$	=	Capital Expenditure (Billion rupiah) in district/city i in year t (natural logarithm)

LN_GDRP_{it}	=	Gross Domestic Regional Product (rupiah) in district/city i in year t (natural logarithm)
LN_HEALTH_{it}	=	health facilities (units) in district/city i in year t (natural logarithm)
LN_EDU_{it}	=	Educational facilities (units)) in district/city i in year t (natural logarithm)
$GINI_{it}$	=	Gini ratio of district i in year t
TPT_{it}	=	Open unemployment rate (percent) of district i in year t
i	=	Cross section data of 15 regencies/cities in West Java Province
t	=	Years of research from 2013 to 2020
ε_{it}	=	Error

IV. RESULTS AND DISCUSSIONS

1. Impact of Fiscal Decentralization on Human Development Indeks in South Sumatera Province:

1.1 Best Model Selection: The selection of the best model in panel data analysis is carried out through two stages, namely the chow test and Hausman test. The chow test is carried out in selecting the FEM or PLS model. In the chow test, the probability value of 0.0000 is smaller than the real level α (5%), meaning that there is enough evidence to reject H0. The result purpose that the FEM model is better than the PLS model. After doing the chow test, then we do the Hausman test. The results of the Hausman test obtained a probability value of 0.0000 smaller than the real level α (5%), meaning that there is enough evidence to reject H0 or the FEM model is better than REM. So that it can be said that the best model in this study is the Fix Effect Model (FEM).

1.2 Classical Assumption Test: Fixed Effect Model (FEM) is the best model for conducting research data analysis. Then it will be continued by testing the classic assumptions to meet BLUE (best, linear, unbiased, and estimated). The first test we do is the normality test. The normality test showed that the Jarque–Fallow value of 3.9994 was greater than 0.05 and the probability value of 0.1354 was greater than 0.05 so it can be concluded that the model already has error terms that spread normally. The second test is a multicholinearity test by looking at the comparison between probability values and the correlation matrix between variables. The model has an R-squared value of 0.9909 and all free variables are significantly. These results show that the model is free from multicholinearity problems. The heteroskedasticity test can see in the results of Table 2 that the sum square resid value in weighted statistics of 38.5352 is smaller than the sum square resid value in unweighted statistics of 40.6420. This indicates that there is a problem of heterochedasticity that can be overcome in the model. In the final test is an autocoleration test by looking at the Durbin-Watson (DW) numbers. In the analyzed model, the statistical DW value was 0.9826. The autocoleration test is not appropriate, but according to Baltagi this problem can be solved by weighting using General Least Square (GLS) [9]. In models that have used cross section weighting, the problems of heteroskedasticity and autocoleration can be overcome.

2. Estimation Results of Fiscal Decentralization Impact of the Human Development Indeks (HDI):

Table 2 show that the results of the HDI panel data test in South Sumatra Province on fiscal decentralization impact and influencing factors using the Fix Effect Model (FEM) model. The results of the estimates according to the hypothesis presented by the variables DF, capital expenditure, GRDP, educational facilities, and health facilities significantly affect hdi in South Sumatra. However, from the analysis with the FEM model, the variable capital expenditure did not have a significant effect on the HDI in South Sumatra.

Table 2. Results of the estimated fiscal decentralization impact on HDI.

Variables	Coefficient	Prob.
DF	0,0532***	0,0076
LN_MODAL	-0,1620	0,3386
LN_GDRP	4,2429***	0,0000
LN_EDU	1,9686***	0,0004
LN_HEALTH	0,5940***	0,0004
C	-11,407	0,0862
Weighted Statistics		
R-squared		0,9909
Prob(F-statistic)		0,0000
Sum squared resid		38,5352
Durbin-Watson stat		0,9826
Unweighted Statistics		
R-squared		0,9787
Sum squared resid		40,6420
Durbin-Watson stat		0,6620

Notes: ***) significant at 1% real level

Table 2 shows the results of the estimation test with the Fix Effect Model (FEM) model. The variable degree of fiscal decentralization has a significant effect on the human development index (HDI) with a probability value of 0.0076 or significant at a real level of 1 percent. The value of the DF variable coefficient is 0.0532 which means that when there is an increase in the degree of fiscal decentralization (DF) by one percent, it will increase the human development index by 0.05 percent (ceteris paribus). The estimation results are in line with Gousario and Dharmastuti's research entitled "Regional Financial

Performance and Human Development Index" in 2014, which is based on research on 20 level I regions" [10].

These results are strengthened by Wibawa's research that DF has a positive and significant effect on HDI in district/city governments in West Java [11].

In Table 2, the results of the estimated capital expenditure variable have a negative and insignificant effect on the human development index with a probability value of 0.3386. With these results, it is stated that the capital expenditure variable is not significantly balanced and with the increase in capital expenditure, it will reduce the human development index. The estimation results obtained are not in accordance with Mirza's research that capital expenditure has a positive and significant effect on HDI [12]. However, research from Sugion and Purbadharmaja stated that capital expenditure has a negative and insignificant effect on the HDI of regencies/cities of Bali Province [13].

GRDP variable (Table 2) has a significant and positive effect on the human development index with a probability value of 0.0000 or significant at a real level of 1 percent. The coefficient value of the GRDP variable is 4.2429 which means that when there is an increase of one percent in the GRDP, it will increase the human development index by 4.29 percent (ceteris paribus). The estimation results are in line with the research of Handayani and Woyanti that GRDP has a positive and significant effect on the HDI of regencies/cities in Central Java [14]. And strengthened by the research of Muliza *et al* that GRDP has a positive and significant effect on HDI [15].

The educational facilities variable (Table 2) had a significant and positive effect on the human development index with a probability value of 0.0004 or significant at a real level of 1 percent. The coefficient value of the educational facility variable is 1.9686 which means that when there is an increase of one percent in educational facilities, it will increase the human development index by 1.96 percent (ceteris paribus). The estimation results obtained are in accordance with Latuconsina's research that educational facilities have a positive and significant effect on the HDI of Malang Regency [16].

The results of the health facility variable (Table 2) had a significant and positive effect on the human development index with a probability value of 0.0004 or significant at a real level of 1 percent. The coefficient value of the health facility variable is 0.5940 which means that when there is an increase of one percent in educational facilities, it will increase the human development index by 0.60 percent (ceteris paribus). The estimation results obtained are in accordance with Primadani's research that there is a positive and significant relationship with the rate of improvement of health facilities with an increase in HDI [17]. The results of Latuconsina's research stated that health facilities have a positive and significant effect on the HDI of Malang regency [16].

3. Impact of Fiscal Decentralization on Poverty in South Sumatera Province:

3.1 Best Model Selection: The selection of the best model in panel data analysis is carried out through two stages, namely the chow test and Hausman test. The chow test is carried out in selecting the FEM or PLS model. In the chow test, the probability value of 0.0000 is smaller than the real level α (5%), meaning that there is enough evidence to reject H0. The result purposes that the FEM model is better than the PLS model. After doing the chow test, then we do the Hausman test. The results of the Hausman test obtained a probability value of 0.0398 smaller than the real level α (5%), meaning that there is enough evidence to reject H0 or the FEM model is better than REM. So that it can be said that the best model in this study is the Fix Effect Model (FEM).

3.2 Classical Assumption Test: Fixed Effect Model (FEM) is the best model for conducting research data analysis. Then it will be continued by testing the classic assumptions to meet BLUE (best, linear, unbiased, and estimated). The first test we do is the normality test. The normality test showed that the Jarque–Fallow value of 2.5291 was greater than 0.05 and the probability value of 0.2823 was greater than 0.05 so it can be concluded that the model already has error terms that spread normally.

The second test is a multicholinearity test by looking at the comparison between probability values and the correlation matrix between variables. The model has an R-squared value of 0.9682 and all free variables are significantly. These results show that the model is free from multicholinearity problems.

The heteroskedasticity test can see in the results of Table 3 that the sum square resid value in weighted statistics of 30.6801 is smaller than the sum square resid value in unweighted statistics of 33.6849. This indicates that there is a problem of heterochedasticity that can be overcome in the model. In the final test is an autocoleration test by looking at the Durbin-Watson (DW) numbers. In the analyzed model, the statistical DW value was 1.1509. The autocoleration test is not appropriate, but according to Baltagi this problem can be solved by weighting using General Least Square (GLS) [9]. In models that have used cross section weighting, the problems of heteroskedasticity and autocoleration can be overcome.

4. Estimation Results of Fiscal Decentralization Impact of the Poverty:

Table 3 show the results of the poverty panel data test in South Sumatra Province on fiscal decentralization and influencing factors using the Fix Effect Model (FEM) model. The results of estimates according to the hypothesis presented by the variables DF, capital

expenditure, GRDP, unemployment rate, and gini ratio significantly affect poverty in South Sumatra.

Table 3. Results of the estimated fiscal decentralization impact on poverty.

Variables	Coefficient	Prob.
DF	-0,0098	0,6328
LN_CAPITAL	-0,3535**	0,0267
LN_GDRP	-1,6998***	0,0000
TPT	0,0899**	0,0124
GINI	3,4251**	0,0308
C	48,6522	0,0000
Weighted Statistics		
R-squared		0,9682
Prob(F-statistic)		0,0000
Sum squared resid		30,680
Durbin-Watson stat		1,1509
Unweighted Statistics		
R-squared		0,9492
Sum squared resid		33,6849
Durbin-Watson stat		0,9201

Notes: ***) significant at 1% real level
**) significant at 5% real level

Table 3 shows the results of the estimation test with a fix effect model (FEM) with a variable degree of fiscal decentralization having a negative and insignificant effect on poverty in South Sumatra Province with a probability value of 0.6328. With these results, it is stated that the DF variable has no significant effect and with an increase in DF, it will reduce poverty. The results of these estimates are in line with research conducted by Purnomo and Danuta (2022) which proves that the Degree of Fiscal Decentralization (DF) that DF has a negative and insignificant effect on poverty [18].

The results of the estimated capital expenditure variable have a negative and significant effect on poverty with a probability value of 0.0267 or significant at a real level of 5 percent. The coefficient value of the capital expenditure variable is 0.3535 which means that when there is a one percent increase in capital expenditure, it will reduce poverty by 0.35 percent (ceteris paribus).

The results of the estimates obtained are in accordance with the research of Sendouw *et al* that capital expenditure has a negative and significant effect on poverty [19]. Strengthened by research by Sulisiyowati *et al* stated that capital expenditure has a negative and significant effect on the poverty of districts/cities in East Java [20]. With the results of the estimates, it is stated that the allocation of capital expenditure in South Sumatra is able to reduce poverty.GRDP variable (Table 3) has a significant and negative effect on poverty with a probability value of 0.0000 or significant at a real level of 1 percent. The coefficient value of the GRDP variable is 1.6998 which means that when there is an increase of one percent in GRDP, it will reduce poverty by 1.7 percent (ceteris paribus).

The results of the estimates are in accordance with Giovani's research that GRDP has a negative and significant effect on poverty [21]. Then the results of the estimate obtained by the research of Lestari *et al* that GRDP has a negative and significant effect on the poverty of Pemalang district [22].

TPT variable has a significant and positive effect on poverty with a probability value of 0.0124 or significant at a real level of 5 percent. The coefficient value of the TPT variable is 0.0899 which means that when there is a 1 percent increase in the TPT, it will increase poverty by 0.09 percent (ceteris paribus). The results of the estimates obtained are in accordance with Giovani's research that unemployment does not have a significant effect on poverty in Java [21]. However, in Susanti's research who analyzed the unemployment rate on poverty in West Java stated that unemployment has a positive and significant impact on poverty [23].

The results of the gini ratio variable have a significant and positive effect on poverty with a probability value of 0.0308 or significant at a real level of 5 percent. The coefficient value of the gini ratio variable is 3.4251 which mean that when there is a 1 percent increase in the gini ratio, it will increase poverty by 3.42 percent (ceteris paribus). The results of the estimates obtained are in accordance with the research of Hassan *et al* that there is a positive and significant relationship with income inequality with an increase in poverty [24]. Strengthened by the results of research by Riandi and Varlitya stated that this ratio has a positive and significant effect on the poverty of provinces on the island of Sumatra [25].

VI. CONCLUSION

Based on the results and discussions, the conclusions that can be drawn are: The impact of fiscal decentralization on HDI through the regression of panel data shows that the degree of fiscal decentralization has a positive and significant effect on the Human Development Index (HDI), but capital expenditure does not have a significant effect on HDI. Other variables such as GRDP, educational facilities, and health facilities have a positive and significant effect on HDI in South Sumatra.

The impact of fiscal decentralization on poverty through regression of panel data shows that the degree of fiscal decentralization has no significant effect on poverty, but capital expenditure has a significant effect on poverty reduction. Other variables such as GRDP have a significant effect on poverty alleviation in South Sumatra.

Variables of open unemployment rate and gini ratio have an effect in increasing poverty.

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