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POVERTY ALLEVIATION IN THE CONTEX OF FISCAL DECENTRALIZATION IN INDONESIA

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ABSTRACT. Acceleration of poverty reduction in Indonesia is largely determined by the role of regional governments in implementing fiscal decentralization. Three indicators of fiscal decentralization were used to measure their effects on poverty reduction, i.e., regional government expenditures, regional government revenues, and intergovernmental transfers. This study investigated the panel data regression models for 33 provinces in Indonesia during 2010-2016. The results show that regional government revenues and intergovernmental transfers had a statistically significant effect on reducing poverty while regional government expenditures did not. This study confirms that in the context of fiscal decentralization in Indonesia, the increase of regional government revenues both from own source revenues and intergovernmental transfers appear to be more effective in encouraging poverty reduction than the increase of the total regional government expenditures. Therefore, it is very important for policymakers at the regional level to encourage the increase of regional revenues in order to create enough fiscal space to fund poverty alleviation programs on the one hand. On the other hand, it is necessary to increase the proportion of regional government expenditures to priority programs for poverty alleviation more than regional government operational expenditures.

JEL Classification: H30, H72, I31, I38, O11

Keywords: fiscal decentralization, poverty, intergovernmental transfer, own source revenue, regional expenditure, Indonesia, panel data.

Introduction

Fiscal decentralization has been implemented in Indonesia for approximately 16 years (until 2016). From 2001 to 2016, intergovernmental transfers from the central governments to regional governments increased ninefold, from IDR 82.4 trillion to IDR 723,2 trillion and were distributed to 34 provinces and 542 districts/cities in Indonesia. In 2016, the share of transfers received by provincial and regency/city governments to total revenues in all regions reached the average of 54 percent, and there were several regions receiving transfer funds above 60

percent, such as West Nusa Tenggara, Lampung, Bengkulu, South Sulawesi, Jambi, West Sumatra, and Central Java. While the share of provincial and district/city spending in total government expenditure reached the average of 3 percent. Although there was an increase in intergovernmental transfers from the central government and an increase in regional government spending during the decentralization period, the government still faced serious problems with fighting poverty. The number and the percentage of poor people tended to decrease every year, but this decrease was relatively slower than the increase in transfers fund and government spending. In 2016, the number of poor people amounted to 27.76 million, or 10.67 percent of the total population of Indonesia. There were 16 out of 34 provinces in Indonesia with a higher percentage of the poor and three of them have the poverty rate above 20 percent, i.e., Papua, West Papua and West Nusa Tenggara.

This fact has raised critiques on to what extent fiscal decentralization was able to reduce poverty. Most empirical studies that examined the effect of fiscal decentralization on poverty reduction in both developed and developing countries, including Indonesia, resulted in rather debatable findings. The effect of fiscal decentralization on poverty reduction depended on two aspects (Sepulveda and Martinez-Vazquez (2010): (i) direct and indirect paths, (ii) indicators of fiscal decentralization measurement. Thus, to analyze whether fiscal decentralization affects poverty reduction, it is necessary to look at the most appropriate pathway and indicators of fiscal decentralization. There are three indicators generally used in empirical studies on this subject, i.e., expenditure decentralization, decentralization of revenues through own source revenue, and decentralization of revenues through intergovernmental transfers. Regional revenues obtained through intergovernmental transfers from the central government play a major role in regional finance in the majority of developing countries, including Indonesia. However, to ensure that decentralization of revenues is real for the region, an increase in the proportion of regional revenues derived from own sources is urgently needed (Khadondi, 2018**)**. Adam and Bevan (2001) pointed that although regional revenues, especially from tax revenues, are not appropriate for poverty alleviation strategies, in general, the state carries out tax reform to increase the fiscal capacity as a source of financing public expenditures. Since poverty is directly related to low fiscal capacity and greater expenditure needs, intergovernmental transfers add to the fiscal capacity of a region and can be used for poverty alleviation programs. Thus, in the context of fiscal decentralization, increasing regional revenues provides a large fiscal space for the regions to fund priority programs including those for poverty alleviation. According to (Sepulveda and Martinez-Vazquez, 2010), revenue and expenditure decentralizations are complementary and work differently to reduce poverty.

This study aims to estimate the effect of fiscal decentralization indicators on poverty reduction in Indonesia. It was highly urgent to be undertaken considering that different fiscal decentralization indicators would result in differences in the values and policy implications for poverty reduction. Since 2001, the Government of Indonesia has implemented the policy of fiscal decentralization in accordance with the Law No. 22 as of 1999 concerning the Regional Government and the Law Number 25 as of 1999 about Financial Balance Between Central and Regional Governments (PKPD) which has undergone several revisions, the last one of which is the Law Number 23 as of 2014 concerning Regional Government and also Law Number 33 as of 2004 concerning the Financial Balance Between Central and Regional Government. Since then, there have been changes observed in the size of the budget, regional expenditure and revenues up to the current year

Table 1. The Trend of Own Source Revenues, Intergovernmental Transfer, and Government Expenditure Based on Provinces in Indonesia in 2001, 2010, 2016 (IDR Billion)

Provinces	Year								
	2001	2010	2016	2001	2010	2016	2001	2010	2016
	Own Source revenue (IDR Billion)			Intergovernmental transfer (IDR Billion)			Government Expenditure (IDR Billion)		
Nanggroe Aceh Darussalm	99.2	1165.5	4,718.3	3071.8	10959.7	20,337.7	3124.1	17554.3	42,180.5
North Sumatra	644.7	3755.5	9,136.8	3878.8	15297.5	34,386.7	4741.9	19410.9	49,817.0
West Sumatra	239.6	1540.4	3,647.0	2021.2	8184.2	18,022.2	2240.3	11201.7	23,990.4
Riau	626.5	2621.2	4,954.7	6700.8	14779.9	18,394.9	5734.0	15966.0	29,730.7
Jambi	157.0	952.6	2,245.9	1253.9	6314.4	11,402.2	1349.7	6751.1	15,418.0
South Sumatra	287.1	1994.2	4,738.9	2559.2	11083.2	21,709.6	2733.5	13690.2	29,209.3
Bengkulu	60.8	462.0	1,243.0	748.7	3511.1	8,702.4	777.0	4484.7	11,180.8
Lampung	208.1	1578.0	3,805.1	2104.8	7408.1	18,692.3	2224.7	9729.7	25,211.5
Bangka Belitung Islands	51.9	811.2	1,240.5	422.4	2718.0	5,934.6	415.5	6536.7	8,501.4
Riau islands*			2,799.0			7,023.2			10,519.9
DKI Jakarta	3644.2	12892.0	36,888.0	3684.5	9537.6	15,271.7	6856.7	21552.9	47,128.8
Western answer	2001.1	10856.1	34,660.1	7766.1	26237.8	54,929.9	9861.3	40904.8	107,176.1
Central Java	1506.7	7743.3	22,783.5	8858.5	24235.6	63,491.9	9450.5	33465.5	90,591.8
Yogyakarta	245.3	1255.1	3,722.4	1113.2	3659.0	7,422.7	1467.5	5416.9	13,043.4
East Java	2118.2	11021.1	31,230.7	10036.1	28415.6	60,489.2	11176.2	42431.3	107,580.9
Banten	440.7	3337.8	12,242.9	1672.1	6450.1	13,364.3	2007.2	9849.8	29,984.2
Bali	753.8	3135.5	9,138.0	1659.6	4594.8	97,318.6	2561.3	7968.5	22,303.7
East Nusa Tenggara	112.4	682.4	2,284.3	2227.2	5564.5	18,753.1	2209.1	9278.7	24,103.9
West Nusa Tenggara	138.2	826.9	2,804.1	1576.9	7860.1	13,693.6	1696.6	6879.7	17,375.1
West Kalimantan	207.5	1017.4	3,010.3	1875.2	7152.9	15,614.6	2037.3	8765.2	22,537.6
Central Kalimantan	164.6	777.8	2,128.8	1341.3	7212.1	14,628.9	1479.9	8386.7	19,041.4
South Kalimantan	228.1	1720.0	4,145.4	1559.3	6526.3	16,462.0	1875.5	9782.0	23,566.4
East Kalimantan	367.5	3469.5	6,548.6	6521.9	15940.9	19,431.5	5499.7	19636.1	28,090.8
North Kalimantan*		652.6	817.6		5492.1	5,988.3		6901.6	8,401.1
North Sulawesi	128.4	622.5	1,867.0	870.2	5396.9	12,166.1	1103.6	6674.7	16,117.5
Central Sulawesi	86.5	2328.9	1,935.9	1166.0	11043.0	13,547.8	1249.7	14699.8	17,403.5
South Sulawesi	411.9	537.9	6,981.0	3240.5	5271.6	27,641.4	3462.9	6112.1	38,848.5
Southeast Sulawesi	63.7	3135.5	1,436.1	957.9	4594.8	13,740.9	1065.8	7968.5	16,969.8
Gorontalo	23.0	259.5	807.3	421.6	2325.1	54,687.8	435.2	2885.8	6,829.4
West Sulawesi*		143.2	593.4		2261.0	59,933.1		2736.9	74,513.2
Maluku	13.8	299.6	989.2	566.8	4505.1	10,146.0	587.7	5411.2	12,861.1
North Maluku	16.1	232.6	597.4	568.7	3386.9	8,290.3	585.5	3932.9	10,084.8
Papua	115.2	880.3	2,417.1	3296.9	15257.4	32,263.7	3262.3	21283.5	49,451.4
West Papua*		288.4	842.2		5826.7	13,471.5		8864.9	20,634.0
Total	15.162	82.997	229.401	83.741	299.003	827.355	93.272	417.115	1.070.398

Source: Indonesian Ministry of Finance. Data processed
*new provinces

Delegating the authority to the regional government had some implications in collecting the funding and financial transfers to the regions government. Furthermore, the regional government was given the authority to allocate expenditure for public interests in each region. Since the regional autonomy and fiscal decentralization was implemented, the number of provinces in Indonesia increased by 4, namely West Sulawesi, North Kalimantan, Riau Islands, and West Papua. In 2001, the four provinces were still joining the parent province so data in Table 1 were not available.

In 2001, the regional government (province + district / city) had various and very limited ability to collect the fund from the local region. In total, regional revenues that were able to be collected by all local governments were on average of IDR 15,162 billion in 2001, but 10 years later, regional own source revenues (PAD) increased dramatically to IDR 82,997 billion in 2010 or increased by around 447 percent and in 2016, it was recorded at IDR 229,003 billion. Some

regions at the beginning of fiscal decentralization had very small revenues from their local citizens (own source revenue) such as the Province of Maluku, Southeast Maluku, and Gorontalo which collected IDR 13.1 billion, IDR 16 billion, and IDR 23 billion respectively. However, in 10 years, in the implementation of fiscal decentralization, the regional government made efforts for an intensification and extensification so that the value of own source revenue (PAD) increased sharply until 2016. This condition explains that fiscal decentralization through regional revenue indicators had a positive impact on regional governments in exploring revenue sources from their respective regions. The higher the regional own source revenue, the greater the regional fiscal capacity to fund public service programs.

Another indicator is that funds from the central government transferred to regional governments also brought a positive effect on regional governments. In 2001, the initial year of implementing the fiscal decentralization, the transfer funds from the central government to each region varied according to the calculation formula set by the central government. Some regions received relatively smaller funds compared to other regions, such as Gorontalo and Bangka Belitung. But after subsequent developments with various efforts to improve the fund transfer mechanism, these regions could receive substantial transfer funds. All regions in Indonesia receive transfer funds which is increasing every year. In 2001, the total amount of transfer funds sent to all districts / cities and provinces was IDR 83,741 billion then it increased sharply in 10 years to IDR 299,003 billion in 2010, and in 2016 it reached IDR 827,355 billion. This increase is an opportunity for regional governments to reduce the poverty in its area. PAD and transfer fund are the funding resource of development in each region.

Increased transfer funds and PAD have implications for total regional expenditure. In 2001, it dramatically increased from IDR 93,272 billion to IDR 417,115 billion in 2010 and continued to grow to IDR 1,070,398 billion in 2016. This drastic increase was one of the implications of the expenditure authority granted to regional governments. The regional government allocates expenditure for the public interest which in turn brings a positive impact on reducing poverty both regionally and nationally.

This study used panel data from 33 provinces to capture the role of regional governments in responding to the needs of the poor in the decentralization era in Indonesia. A previous study on the Indonesian case using panel data from the Eastern regions of this country which was conducted by Maharajabdinul, *et al*. (2015) only focused on the intergovernmental transfers as a fiscal decentralization indicator. Abdillah and Mursinto, (2016) used panel data from 33 provinces' own-source revenues as the indicator of fiscal decentralization. Recent studies carried out by Sasana and SBM (2018) using panel data for 35 districts/cities in Central Java province focused on government expenditure as an indicator of fiscal decentralization.

1. Literature review

Theoretically, the relationship between fiscal decentralization and poverty reduction appeared less obvious (Von Braun and Grote, 2000). However, when it is referred to the public economic theory, Tiebout (1956) and Musgrave (1959) stressed the importance of improving public services to society, that fiscal decentralization could be correlated to poverty alleviation. The success of fiscal decentralization to alleviate poverty depends on the role of regional governments in allocating expenditures to improve public services to communities, establish taxes without burdening the poor, and utilize transfer funds for development that address the needs of the poor. Martinez-Vazquez (2011) argued that fiscal decentralization could directly reduce poverty, depending on each fiscal decentralization process, for example through the composition of public expenditure.

The relationship between fiscal decentralization and poverty reduction has attracted more scientists in the last few decades. This is mainly due to the debate on the results of

empirical studies conducted in both developed and developing countries including Indonesia. The debates on the results are mainly due to three factors: (i) differences in the measurement of fiscal decentralization indicators, and (ii) the development of analytical models, and (iii) poverty measurement indicators. Fiscal decentralization can be measured through four pillars: expenditure, revenue, intergovernmental transfers and loans (Martinez-Vazquez and McNab, 2001, Boex, *et al*. 2006, and Martinez-Vazquez *et al*., 2015). Stossberg *et al*. (2016) measured fiscal decentralization through four indicators, namely income, tax, spending, and tax autonomy. Each measurement of fiscal decentralization has different roles and values for poverty reduction (Liu *et al*. 2013; and Voigt and Blume, 2012).

Several empirical studies which used expenditure indicators, among others; Sepulveda and Martinez-Vazquez (2010) in terms of beyond of the critical point, Asante and Ayee (2010), Ahmed, Manzoor (2013), Moche *et al*. (2014) for South Africa and recent Jellema *et al.* (2016) for Uganda and Bekele and Kjosavik (2016) for Ethiophia, found a positive relationship between fiscal decentralization and poverty. However, other studies such as Crook and Sverrisson (2001), Steiner (2005), and Banwo (2012) found a negative relationship between decentralized expenditure with poverty. In terms of revenue, Valaris (2012) found a positive relationship between fiscal decentralization and poverty reduction. However, it is contrary to the finding of the recent study in Colombia (Ramírez *et al.* 2016) which used the intergovernmental transfer as indicator of the fiscal decentralization. It was found that both general and specific transfers contributed to poverty alleviation in Vietnam.

In addition to the measurement of the fiscal decentralization indicator, another interesting development measure for assessing the relationship of fiscal Decentralization and poverty is the difference in poverty indicators. Von Braun and Grote (2000) and Sepulveda and Martinez-Vazquez (2010) used the human development index as a proxy for poverty. Ahmed (2013) used headcount index and household income indicators, and Azila-Gbettor *et al.* (2014) used non-monetary poverty indicators of income consumption. Those studies found a negative effect of fiscal decentralization and poverty in Ghana and their finding were consistent with Ramírez *et al.* (2016) in Columbia through the poverty headcount index and poverty gap.

Differences in the results of the study were also affected by the distinctive analysis models. The development of an analytical model is intended to find appropriate mechanisms for analysing the relationship between fiscal decentralization and poverty reduction. The relationship between fiscal decentralization and poverty reduction could be estimated directly or indirectly (Boex and Martinez-Vazquez, 2001; Martinez-Vazques, 2011). The development of other models such as the one conducted by Yao (2007), Valaris (2012), Sepulveda and Martinez-Vazquez (2010) and Moche *et al.* (2014) used a panel data regression model while Bird and Rodrigues (1999) used comparative analysis in the case of Philippines.

Empirical studies conducted in Indonesia such as Booth (2003), Tjoe, *et al*, (2013), Kusumaningrum (2013), Soejoto *et al*. (2015), Maharajabdinul *et al*. (2015), Abdillah and Mursinto, (2016), Simanjuntak and Mukhlis (2017), and recent studies on Sasana and SBM (2018) resulted in different findings. Kusumaningrum (2013) found that there was no clear relationship between fiscal decentralization and a reduction in poverty. Besides, Maharajabdinul *et al.* (2015) found an insignificant effect of transfer funds on poverty in Eastern Indonesia, and Abdillah and Mursinto (2016) found an insignificant effect of provincial own-source revenues on local poverty reduction through panel data. However, Simanjuntak and Muhklis (2017) found a significant influence of fiscal decentralization on poverty as an indicator of social justice. Studies in line with Sasana and SBM (2018) found that the ratio of total regional expenditure as an indicator of fiscal decentralization had a significant effect in reducing poverty in Central Java.

This study developed a broader measure of fiscal decentralization through three indicators of revenue, expenditure, and transfer funds to analyse their respective effects on

regional poverty reduction in Indonesia. Empirical studies for the Indonesian case are still relatively limited and mainly investigated panel data from 33 provinces in Indonesia. The use of those panel data reflected the involvement of regional governments in addressing poverty through revenues assignment, expenditure assignment, and intergovernmental transfers. In the era of decentralization and regional autonomy, the role of regional governments to overcome poverty and the need for control and transparency of regional government (Bin Kikuni, 2015) were enormous (Valaris, 2012). Agegnehu and Dibu (2016) found that the weak impact of fiscal decentralization on poverty reduction in Ethiopia was due to weak regional fiscal capacity, weak accountability and transparency of regional government.

2. Methodological approach

This study used a panel data regression model from 33 provinces in Indonesia from 2010-2016. The 33 provinces were Nanggroe Aceh Darussalam, North Sumatra, West Sumatera, Riau, Jambi, South Sumatra, Bengkulu, Lampung, Bangka Belitung Islands, Riau Islands, DKI Jakarta, West Java, Central Java, DIY Yogyakarta, East Java, Banten, Bali, East Nusa Tenggara, West Nusa Tenggara, West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, Gorontalo, West Sulawesi, Maluku, North Maluku, Papua, West Papua.

Measurement of fiscal decentralization consists of three indicators namely regional government revenue (RFD), regional government expenditure (EFD), and intergovernmental transfer (TFD). Regional government revenue is measured by the share of total regional own source revenues (PAD) and other legal regional revenues for provinces and all districts/cities governments in the region to the total regional government revenue. Regional government expenditure is measured by the share of total government expenditure for provinces and all districts/cities in the region to total government expenditure. Intergovernmental transfers (TFD) is measured as the share of total intergovernmental transfer for provinces and all districts/cities to total regional government revenue in each region. The total government expenditure is the sum of regional government expenditure in all provinces and districts/cities and national governments in a given year. While the total regional government revenue is the sum of regional government revenues in all provinces and districts / cities in a given year. The total intergovernmental transfer is the sum of intergovernmental transfer for all provinces and districts/cities in a given year. The total number of districts/cities in this study was 480 and the total of provinces was 33.

Poverty indicator (Pov) was measured as the percentage of poor people in each province in 2010-2016. Several major control variables (CV) that are quite strong to influence poverty reduction include the economic growth (Growth), income inequality (Gini Ratio), per capita income (Ycp), Human Development Index (HDI), and government size (Gz). All control data variables were obtained from Indonesian Central Bureau of Statistics (BPS) and Provincial BPS, while data on regional government revenues, regional government expenditures, intergovernmental transfer, and regional own revenue were obtained from the Ministry of Finance of Indonesia; Directorate General of Fiscal Balance; and Publications of BPS.

Sepulveda and Martinez (2010) developed an estimation model to identify the empirical effect of fiscal decentralization on poverty reduction both in linear and nonlinear ways. The equation of the non-linear regression model showed two different possible scenarios, which first, fiscal decentralization helped to overcome the poverty, and secondly, there was counterproductive of the involvement of regional governments in carrying out redistribution policies.

This study follows an estimation model developed by Sepulveda and Martinez (2010) to analyze the extent of the effect of fiscal decentralization on poverty reduction in Indonesia

by using three indicators of fiscal decentralization.The general model of the estimation equation for panel data is as follows:

$$Pov_{it} = \propto_{it} + \beta FD_{it} + \beta FD_{it}^2 + \gamma Cv_{it} + uit \quad (1)$$

Pov is the poverty, FD is a vector of fiscal decentralization indicators including RFD, EFD, TFD, FD^2 is a vector of squared for each fiscal decentralization indicators, CV is the control variables which include Growth, Gini Ratio, Ycp, HDI, and Gz. i=1, 2, 3,...33; (number of provinces) and t =1,2,3,4,5,6,7 is the time period of 2010-2016. Dummy variables (DM) were incorporated into the model to determine if there were differences in the effect of each fiscal decentralization indicator between marginal regions and other regions. The determination of the marginal regions was based on the three indicators i.e. the share of regional revenue, the share of regional expenditures, and the share of intergovernmental transfers. If the value of each indicator of a region was smaller than the average, then it was categorized as a margin area. Value 1 indicated the marginal area and the 0 for others. Each fiscal decentralization indicator was regressed to poverty separately in the estimation equation model.

The estimation equation for expenditure indicator is as follow:

$$Pov_{it} = \beta_{it} + \beta 1 EFD_{it} + \beta 2 EFD_{it}^2 + \beta 3 Gini\ Ratio_{it} + \beta 4 Ycp_{it} + \beta 5 Growth_{it} + \beta 6 HDI_{it} + \beta 7 Gz_{it} + \beta 8 DMEFD_{it} + \varepsilon_{it} \quad (2)$$

The estimation equation for intergovernmental transfer indicator is as follow:

$$Pov_{it} = \gamma_{it} + \gamma 1 TFD_{it} + \gamma 2 TFD_{it}^2 + \gamma 3 Gini\ Ratio_{it} + \gamma 4 Ycp_{it} + \gamma 5 Growth_{it} + \gamma 6 HDI_{it} + \gamma 7 Gz_{it} + \gamma 8 DMTFD_{it} + \mu_{it} \quad (3)$$

The estimation equation for revenue indicator is as follows:

$$Pov_{it} = \alpha_{it} + \alpha 1 RFD_{it} + \alpha 2 RFD_{it}^2 + \alpha 3 Gini\ Ratio_{it} + \alpha 4 Ycp_{it} + \alpha 5 Growth_{it} + \alpha 6 HDI_{it} + \alpha 7 Gz_{it} + \alpha 8 DMRFD_{it} + \epsilon_{it} \quad (4)$$

Three models of regression analysis using panel data included the Common Effect (CE) which was used with Pool Ordinary Least Square (OLS), the Fixed effect (FE) and the Random effect (RE). CE assumes that when the characteristics of the unit cross-section are the same, the use of OLS will be efficient. Fixed Effect emphasized that the different units of cross sections were accommodated into different intercept values but the regression coefficient remained the same at different times. While random effects explained the differences in cross sections unit and time. Thus, differences of provinces and poverty characteristics can be analyzed through FE and RE models. However, to ensure the accuracy of the use of FE and RE models in panel data, the testing was conducted. To identify whether the CE regression result was better than FE, F Test was used. To select whether FE was better than RE, the Hausman Test was implemented.

3. Conducting research and results

Based on F test results, FE regression model was better than CE because the F test value had a smaller significant level (5 percent). While the results of the Hausman Test were below at the significant level of 5 percent, the FE model was better than CE. Therefore, this study

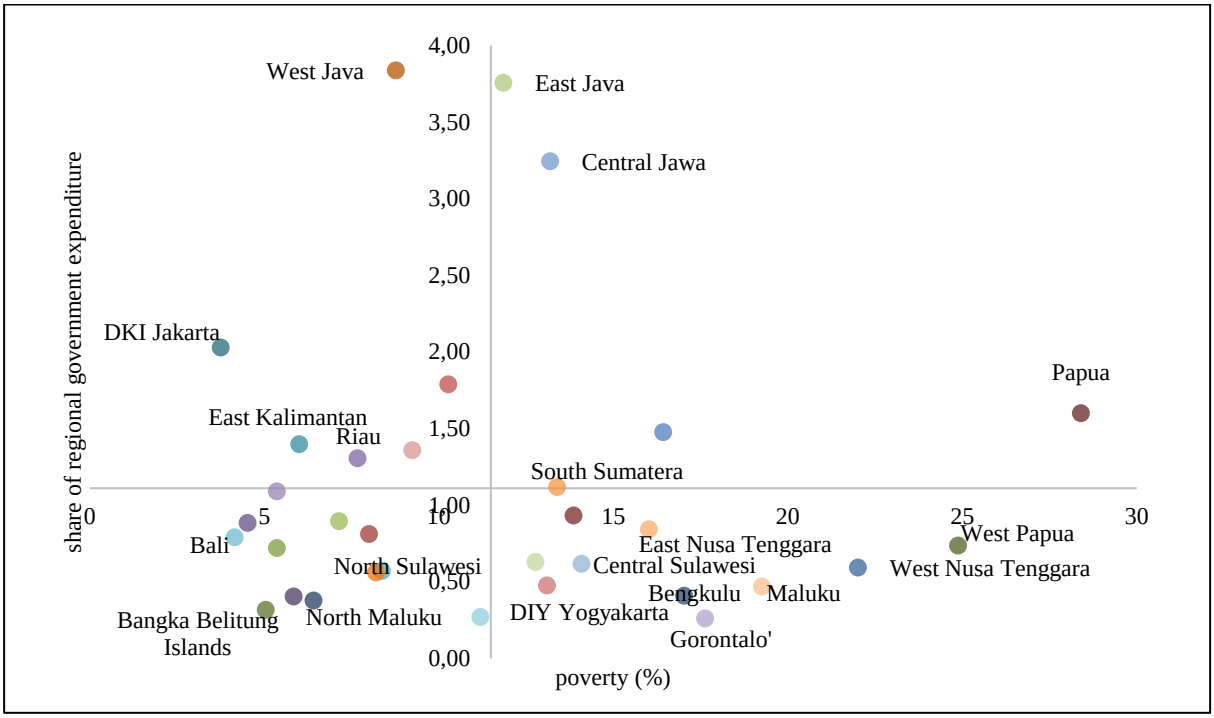
referred to the regression result of the FE model. Based on the regression, it is found that each fiscal decentralization indicator had the different effect on poverty reduction. In equation (1) in Table 1, it is shown that the share of regional government expenditure to the total government expenditure had a positive sign on poverty, while the coefficient of the quadratic share of regional government expenditure had a negative sign. The results of this study indicated that the effect of regional government expenditure on poverty reduction appeared to be non-linear. The study resulted in an inverted U-shaped relationship between fiscal decentralization and poverty.

The study resulted in an inverted U-shaped relationship between fiscal decentralization and poverty which means that there was no fiscal decentralization (FD = 0), and the increase on regional government expenditure also increased the poverty to a certain point, but after passing the maximum point, an increase in regional government expenditure reduced the poverty. This is in line with Yao (2007), Sepulveda and Martinez-Vazquez (2010), Valaris (2012), Silas *et al*. (2018). Inverted U-shape was indicated by the positive sign of the EFD and the negative sign of the EFD squared coefficient. The coefficient sign was supported by Sepulveda and Martinez-Vazquez (2010) in the case of 297 countries including developed and developing ones. They found that the increasing share of regional government expenditure reduced the poverty if the share of regional government expenditure was at the maximum of one-third (32.4 per cent) of total government expenditure.

The negative relation of expenditure fiscal decentralization to poverty is in line with previous studies by West and Wong (1995) conducted in China and Ramírez *et al*. (2016). While the positive relationship of this study is consistent to Moche *et al.* (2014) showing that the fiscal decentralization positively affected the poverty in South Africa which means that the higher the share of expenditure is, the higher the poverty will be. The results of the current study confirmed that if the share of regional government expenditure to total government expenditure was beyond from the turning point of 3.1 per cent, an increase in the share of regional government expenditure at the beginning of the fiscal decentralization process appears not to be powerful enough to improve the living standards of the poor. This means that the majority of additional regional government expenditure share was still allocated to routine governmental programs, so the redistribution policy to finance poverty alleviation programs was still very limited. Therefore, to accelerate the poverty reduction, local governments especially for the marginal regions need to encourage a higher share of expenditures to be above 3.1 per cent for poverty alleviation programs. The turning point value was obtained from the partial derivative of the poverty equation with respect to fiscal decentralization, equating to zero and could be used the reference to solve the fiscal decentralization (Yao, 2007 and Silas *et al*. 2018). The turning point of expenditure fiscal decentralization was $\frac{\partial Pov}{\partial FD}$ =1.996-2(0.340)EFD +0.114 DMEFD=0. EFD= $\frac{1.996+0.114DEFD}{2(0.340)} = 3.1$ percent given Dummy EFD $= 1$ for marginal regions.

The proportion of regional government expenditure to the total government expenditure including the national government in Indonesia was various. In 2016, there were only three regional governments which had a share of regional expenditure on total regional government expenditure above 3 percent, such as West Java, Central Java and East Java, while the remainders were below of 3 percent. Many regions that had high levels of poverty such as Papua, West Papua, West Nusa Tenggara, Maluku, Gorontalo, had share of the government expenditure on total government expenditure which were quite low (in the range between 0 and 1) (Ficture 1). This means the proportion of the regional government expenditure in autonomy era was not sufficient to encourage the improvement of community welfare, especially for the poor. Poverty alleviation in the perspective of fiscal decentralization in Indonesia had not been fully contributed by the decentralization of regional government expenditure. In other words,

the source of financing for poverty alleviation programs in Indonesia was still dominated by the central government.



Ficture 1. Poverty and Share of Regional Government Expenditure to total government expenditure in 2016
Source: Ministry of Finance, Central Bureau of Statistics: Data processed

A factor causing the insignificant effect of regional government expenditure on poverty reduction is that it was mostly spent on regional operational expenses including civil servant salary so that the allocation to poverty alleviation was still relatively low. This fact is in line with Nursini *et al.* (2018) indicating that the proportion of regional government expenditure to fund poverty alleviation programs in Bone District was only around 6.86% of IDR 1841.8 billion in total regional government expenditure. Another contributing factor was the aggregation measurement of government expenditure instead of the composition of government expenditure. The composition of expenditures, in particular, the share of government expenditure on education and health (Bird and Rodriguez, 1999) had a negative effect on poverty compared to the measurement of the total share of government expenditure. However, in recent years the attention of regional governments in Indonesia to tackle poverty are improving. This corresponds to the negative sign of the quadratic coefficient share of regional government expenditure. Budget allocations for poverty alleviation programs had increased and were followed by the participation of regional government. To that end, regional governments were expected to increase the share of government expenditure, especially to poverty reduction programs that could directly change the social life of the poor.

The result of equation (2) confirms that in the implementation of fiscal decentralization in Indonesia, poverty reduction strategies carried out by each region did not complement each other so that the effect on poverty reduction had not been significant. However, there was a tendency that the high government expenditure allocated to poverty alleviation in each region would have an impact on poverty reduction. This can be seen from the non-linear coefficient of decentralized expenditure.

In the equation (3), the fiscal decentralization indicator measured by the share of

intergovernmental transfer total regional government revenues (TFD) was statistically significant and negative sign and TFD quadratic coefficient was statistically significant at 1 percent and positive sign. The negative relationship between intergovernmental transfer and poverty was not in line with the study conducted by Rao, *et al*. (1998) and Maharajabdinul, *et al.* (2015), but the positive relationship was in line with Valaris (2012). In the structure of the budget in Indonesia, the intergovernmental transfer from the central government is a source of regional government revenue. Three types of intergovernmental transfer in regional budget in Indonesia i.e. tax sharing, general allocation fund (DAU), and specific allocation fund (DAK). This means that the higher transfer funds received by regional governments, the greater the regional financial capacity used to finance development programs including the poverty reduction. One type of transfer in intergovernmental transfers that contributes to poverty reduction directly is special allocation funds. Special allocation funds are transter funds whose allocation has been determined by the central government to encourage development in areas such as the development of education, health and basic infrastructure. Thus, the main cause of the significant effect of intergovernmental transfer is mostly contributed by special allocation fund which was used more for development programs that encourage economic activities which further has a positive impact on the poor.

Based on the turning point of intergovernmental transfer share of 61.5 percent, it is indicated that the increasing share of intergovernmental transfer to total regional government revenue can reduce the poverty if the share of intergovernmental transfer received by each district/city in each province is still below 61.5 percent. However, if the share of intergovernmental transfer moves above the inflection point, then it indicates that the poverty reduction is ineffective (indicated by statistically significant of TFD squared and positive sign). This means that the higher proportion of the intergovernmental transfer received by regional governments, the higher the level of fiscal dependence. At the same time, there is no guarantee of an increase in pro-poor budget allocation policies. This condition is relevant to Indonesia's experience where several regions received a proportion of intergovernmental transfer is above 70 percent with a fairly high level of poverty such as Central Java and West Nusa Tenggara. Several regions have a large percentage of poor people but receive the relatively low intergovernmental transfer, such as West Papua, Maluku, Bengkulu, and Aceh, on the one hand. On the other hand, there are also regions that have a relatively low percentage of the poor but the proportion of intergovernmental transfer received is also lower, such as Banten, Bali and West Java. This fact indicates that poverty alleviation in the era of decentralization depends on the attention of the regional governments and their political commitment in allocating the budget to the poor.

The fiscal decentralization indicator which attracted considerable attention in this study was the share of regional revenues and other ones on their total as shown in the equation (4). The increase of local source revenue and other legal revenues signifies an increase in fiscal independence. This means that the higher the proportion of local source revenue and other legal regional revenues, the higher the fiscal capacity. Thereby, it could reduce the dependence level of the central government through intergovernmental transfers. Based on the estimation, the regression coefficient of share own-source revenue and other legal revenue to total government revenue statistically significant and negative sign while the share quadratic revenue is statistically significant and positive sign. It indicates that the efforts of regional governments to increase PAD did not have a negative impact on the poor. Withdrawal of taxes and levies from high-income groups will then be utilized by the poor through the improvement of public services such as the proficiency of free health and free education. A free education and free health policies have been practiced by most regional governments in Indonesia such as in South Sulawesi, the Gorontalo, and several other provinces and the results are largely effective in reducing poverty. Therefore, this study explained that in the process of fiscal decentralization,

the increase in the share of own-source revenue collected from the public in the form of taxes and levies did not distort the economic activity which means no harm to the poor. Moreover, the increase in own- source revenues boosted the fiscal space of the regions to fund programs that directly address the needs of the poor. The result of this study was in line Jellema *et al*., (2016) which found that the tax system in Uganda reduced the burden experienced by the poor.

Table 2. The Effect of Fiscal Decentralization on Poverty Reduction by Using Panel Data for the 33 Provinces in Indonesia

Independent Variables	Equation (2)	Equation (3)	Equation (4)
EFD	1.996 (1.325)		
EFD squared	-0.340 (0.273)		
TFD		-0.130** (0.060)	
TFD squared		0.002*** (0.0006)	
RFD			-0.155** (0.072)
RFD squared			0.0015** (0.0007)
Gini Ratio	0.435 (0.116)	-0.730 (3.944)	-0.614 (3.922)
Per capita Income	-3.018*** (0.337)	-2.828*** (0.399)	-2.614*** (0.337)
Growth	-0.092** (0.040)	-0.109** (0.048)	-0.109** (0.038)
HDI	0.040 (0.037)	0.025 (0.038)	0.025 (0.038)
Size of Government	-0.046** (0.020)	-0.034 (0.028)	-0.035** (0.023)
Constant	40.358*** (5.179)	43.858*** (5.962)	45.127*** (5.445)
Dummy EFD	0.114 (0.305)		
Dummy TRFD		0.376 (0.631)	
Dummy RFD			0.326 (0.633)
Turning of share expenditure in total regional expenditure (%)	3.1		
Turning of share transfer fund in total regional Government revenue (%)		61.5	
Turning of share own-source revenue in total regional goverment revenue (%)			57.0
R-Squared	0.96	0.96	0.96
Prob. (F-Statistic)	0.0000	0.0000	0.0000
Observations	231	231	231
Number of Provinces	33	33	33

Notes: The standard error of in parentheses
* significant at 10%, ** significant at 5%, and *** significant at 1%. Turning point of share transfer fund TFD= $\frac{-0.130+0.376\,TFD}{2(0.002)} = 61.5$ percent given Dummy TFD $= 1$ for marginal regions, Turning point of share own source revenue RFD= $\frac{-0.155+0.326\,RFD}{2(0.0015)} = 57.0$ percent given Dummy RFD $= 1$ for marginal regions.

The study also found that the increase in share regional own revenue and other legal revenue decreases the poverty level when its share does not exceed the highest limit of 57.0 percent. Increasing the share of regional revenue beyond the turning point leads to the increase of poverty as indicated by the positive sign of the squared RFD coefficient. Under these conditions, an increase in the proportion of regional revenues primarily from local taxes and regional levies can lead to economic distortions that further affect the poor. The high tax rate can actually increase the burden on individuals which further adds the number of the poor (Valaris, 2012).

In addition to the variable of fiscal decentralization, this study also estimated some macroeconomic aspects as control variables that affect poverty reduction, among others; economic growth, Gini ratio, HDI, per capita income, and size of government expenditure. This study is interesting because it shows that some of the macroeconomic social variables have significant effect and negative sign on poverty reduction. Of the three equations, the per capita income variable consistently negatively affects poverty at a significant level of 1 percent. The higher per capita income further reduces the level of poverty. The study was supported by Sepulveda and Martinez-Vazquez, (2010), Valaris (2012), and Azam *et al.* (2016). Likewise, economic growth also negatively affects poverty. Economic growth tends to reduce the level of poverty. This fact is consistent with the phenomenon in Indonesia where in recent years the poverty rate had declined from 10.96 percent in 2014 to 10.64 percent in 2017 as the acceleration of economic growth from 4.8 percent to 5.05 percent in the same year. This study is in line with previous studies such as by Fosu (2009) for Sub Saharan Africa and Abdillah and Mursinto (2016) for Indonesia.

Conclusion

Poverty alleviation in the era of fiscal decentralization in Indonesia is still a major concern from various parties including the regional government. This is shown by the fact that the very slow decline in the number and percentage of poor people almost occurs in all regions in Indonesia. This raises critical questions about the positive impact of the implementation of fiscal decentralization. However, most literature confirmed that the relationship between fiscal decentralization and poverty reduction was quite strong which indicated that fiscal decentralization could reduce poverty. How strong the relationship between fiscal decentralization and poverty reduction depends on the fiscal decentralization indicators. It is because each indicator of fiscal decentralization has a different contribution to poverty reduction.

Three fiscal decentralization indicators used to measure their effects on poverty alleviation were the regional government expenditure, regional government revenues, and intergovernmental transfers. In addition, several macroeconomic variables that affect poverty reduction are also estimated simultaneously into the models namely economic growth, gini ratio, per capita income, human development index, and government size.

Based on the results, we identified that the regional government revenue and intergovernmental transfer have a significant effect on poverty reduction. This means that an increase in government revenue and intergovernmental transfers in each region could increase the regional fiscal capacity that can be used to fund poverty reduction programs effectively.

This study also indicated that the higher the regional revenue share that comes from own source revenues and other legal regional revenues and intergovernmental transfers beyond a certain point, the more ineffective the poverty reduction which is characterized by a positive sign and significant of the variable quadrat regional revenues and quadrat intergovernmental transfer. In terms of the expenditure indicator, this study found that the regional government expenditure does not have a significant effect on poverty reduction. This means that the increase in regional government expenditure was not effective in reducing poverty. In the early stages of the fiscal decentralization process, government expenditure allocations were still concentrated on government administration, but at a later stage, an increasing share of government spending would improve the lives of the poor through policy redistribution to finance poverty reduction programs. This is indicated by the negative sign of the quadrat regional government expenditure coefficient. The study also found that several macro variables had a significant effect on poverty reduction, namely per capita income, size of government, and economic growth.

Therefore, several considerations offered by this study for policy makers in the region including: Firstly, regional government revenues, especially from own source revenue and other legitimate Regional Revenues need to be increased as sources of increasing regional fiscal capacity, on the one hand, and on the other hand, tax rate policies and levy rates, to encourage the increased local revenue, are suggested pro to the poor and do not distort the economy as a whole; Secondly, intergovernmental transfers from the central government, especially the DAU and the DAK, still need to be improved, especially for regions that have a large number and percentage of poor people; Thirdly, it is necessary to increase the regional government expenditure, especially in regions that still face serious poverty problems to fund priority programs for poverty alleviation such as empowerment programs for the poor and small micro-enterprise empowerment programs; Fourthly, the effectiveness of poverty reduction is also determined by improvements in macroeconomic performance, therefore, the regional government should continue to make efforts to accelerate the inclusive economic growth, increase per capita income, and reduce the income inequality.

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