Analysis of the Intergovernmental Transfer Impact on Regional Income Inequality in Indonesia

Naslindo SIRAIT
Faculty of Economic
Andalas University, Limau Manis, Padang, Indonesia
siraitnaslindo@yahoo.com

Hefrizal HANDRA
Faculty of Economic
Andalas University, Limau Manis, Padang, Indonesia
hefrizalhandra@gmail.com

Abstract:

Up until now, the income inequality between regions in Indonesia is still high. In the long term, this will become a serious problem if it is not immediately resolved by inter-regional investment allocation policies. The intergovernmental transfer is an instrument of fiscal decentralization policy in Indonesia since 2001 with three instruments namely shared revenue, general purpose grant, and specific purpose grant. The purpose of this study is to analyze the impact of the intergovernmental transfer on income inequality between provinces in Indonesia since the implementation of fiscal decentralization in 2001-2017, as well as to propose the recommended policies to reduce the basic service inequality. The object of this research was the amount of inequality between regions by using Theil Index. This study was conducted in 32 provinces in Indonesia. Data was processed with SPSS and Microsoft Excel software. The results of this study found that income inequality between provinces in Indonesia was still high. The study also found that the general purpose grant had a negative effect on income inequality between provinces, while the shared revenue had a positive effect on income inequality between provinces, and the specific purpose grant had no effect on income inequality between provinces in Indonesia.

Keywords: income inequality; intergovernmental transfer; decentralization.

JEL Classification: O15; O18; O38.

Introduction

In 15 years, the implementation of fiscal decentralization in Indonesia needs to be evaluated to the extent that fiscal decentralization can achieve its objectives, as stated in Law number 33 of 2004, concerning the financial balance of the central and regional governments. Research by Sukwika (2018) found a fairly high economic inequality (GRDP per capita) between provinces in Indonesia during the 2010-2015 period. This is shown by the value of the Williamson Index of GRDP per capita during the period 2010-2015 ranging from 0.7. The regional economic inequality in Indonesia is still relatively high based on the coefficient value of the variation. This condition lead to the question whether the intergovernmental transfer system which is intended as an instrument of equality has not been effective as an approach of regional development policies to create regional equality.

The intergovernmental transfer, which is a fiscal decentralization instrument consisting of the general purpose grant, specific purpose grant, and shared revenue, is a type of central government transfer to local governments to support the implementation of regional government authority in achieving the objectives of granting autonomy to regions, and to reduce development inequality between regions in Indonesia, especially to improve services and welfare to be more fair and equitable. Many researches regarding intergovernmental transfer have been conducted (Aritenang 2019, Tamai 2019).

The general purpose grant is distributed by the Central Government to the Regional Government which must be determined by the government at least 26% of net domestic income with the aim to equalize the fiscal capability and distribution of financial capacity between regions, and to reduce inequality of financial capacity between regions with the principle of fiscal gap, which is the difference between the fiscal needs and the fiscal capacity in one region. In this case, the financial capacity of the region is determined based on fiscal capacity which is the amount of shared revenue and regional revenue reduced by mandatory expenditure per year.

Specific purpose grant is a matching grant that functions to fund the development needs of national priority facilities and infrastructure to equalize development in accordance with specific problems faced by one region, such as poverty, damaged infrastructure, the infectious diseases and etc. Prior to 2005, specific purpose grant was allocated only to the education, health, government infrastructure, maritime, and fisheries. Up to 2017, specific purpose grant was allocated to 17 aspects including non-physical activities. The direction and policy of specific purpose grant are getting further away from their original objectives in which there are more aspects to be funded.

Shared revenues are funds that are collected and allocated according to a certain proportion of the proportionality of collection or the incidence of revenue from the Central Government. Shared revenue allocation for taxes is set at 20% for producing regions and 80% for the central government, while shared revenue for natural resources is determined at 15% for each province and the remaining 85% for the central. While the allocation of 15% for the next region is also divided by 6% for producing regions and the rest for the surrounding regions.

These three grants have almost the same functions. If these three grants are implemented and used effectively and efficiently, it will lead to economic growth and equitable development among regions in Indonesia. In practice, the allocation of intergovernmental transfer raises considerable inequality of regional financial capacity. This happens because the shared revenue system was allocated to regions based on production capability. As a result, regions that are already relatively prosperous due to their higher production capacity will receive a greater allocation of funds. While regions that are still relatively poor due to their smaller production capacities will also get smaller fund allocations. Consequently, the prosperous regions become more prosperous, whereas the poor regions do not have significant changes, thus regional economic development inequality tends to widen.

Harrod-Domar in Arsyad (2010) developed Keynes's theory by giving a key role to investment in the process of economic growth, especially regarding the dual characteristic of investment. First, investment creates income (which is the impact of investment demand), and second, investment increases the production capacity of the economy by increasing the capital stock (which is the impact of investment supply).

In accordance with Harrod-Domar's theory, regions that receive greater investment allocations from the government, or can attract more private investment to their regions will tend to have a faster economic growth rates. This condition will certainly also be able to encourage the regional development process through the provision of more jobs and a higher income levels per capita. On the other hand, the small investment from government and private sector in a particular region causes economic activity and regional development are less well developed. This leads to the differences in the region's financial capabilities and economic inequalities between regions in Indonesia.

In order to encourage regional economic growth and to reduce economic inequalities between regions, it is necessary to analyse and control the allocation of regional investment. The allocation of private investment can only be controlled indirectly through market mechanisms by improving the position of regional competitiveness. Whereas regional allocation of public investment can be controlled directly by the central government through the establishment of laws and government regulations. The ideal thing is when the allocation of private and government investment support each other (Sjafrizal 2012).

This study is focused on analysing inequality between provinces in Indonesia since the implementation of fiscal decentralization using the Theil Index and investigating the effect of the intergovernmental transfer on inequality between provinces using the linear regression method.

1. Literature review

Many researches related to the relationship between fiscal decentralization and inequality in income between regions have been conducted (Nursini 2019, Timushev 2019). From the academic debate related to fiscal decentralization, there are two point of views regarding the effect of decentralization on regional income inequalities. The first opinion said that decentralization would reduce the disparity. It is stated in Lessmann's research entitled 'Fiscal Decentralization and Regional Disparity: A Panel Data Approach for OECD Countries'. The research analyzed the impact of fiscal decentralization on regional disparities. The regression of cross-country had shown that countries with high levels of decentralization show small regional disparities. Decentralization is not bad for distribution between regions of a country, moreover, decentralization reduces regional disparity. However, some researches are needed. This result can only be applied in developed countries (Lessmann 2006). Daerobi (2019) studied about the disparity in Province in Indonesia.

Research by Bahl and Martinez-Vazquez (2006) entitled 'Sequencing Fiscal Decentralization' stated that decentralization, if well-designed, can make the good decision to people, therefore increasing the efficiency and responsiveness of public service delivery. It can also increase economic growth and offer potentially powerful tools to reduce poverty and inequality.

Research by Bahl and Wallace (2006) investigated the impact of fiscal decentralization on the equality in Rusia. The object of the research were 21 regions in Rusia in 1997, in which the regional government used the mixed fiscal instrument to equalize the expenditure of regional autonomy that need a more amount of allocation and reduce the inequality of regions.

Many countries in the world implement policies in order to reduce poverty and improve income distribution through fiscal decentralization policies. Sepulveda, C.F and Vazquez, J.M. (2011) conducted research focusing on the impact of fiscal decentralization on poverty and income inequality. The samples used were 34 developing countries in Africa in the period 1976-2000. The results showed that fiscal decentralization had a significant effect on poverty and income inequality. Fiscal decentralization increases poverty, but reduces income inequality.

Different opinions stated the danger of fiscal decentralization related to competition for regional and central redistribution collection. Research by Prud'homme (1995) entitled "The Dangers of Decentralization" showed that the increase in inequality is due to competition between governments. The prosperous regions will have a larger tax base, and therefore be able to collect more taxes to provide more public services than other poorer regions. Therefore, regional income inequality will occur.

Research by Brodjonegoro and Asanuma (2000) with the title 'Regional Autonomy and Fiscal Decentralization in Democratic Indonesia' found that shared revenue from central and regional governments sourced from natural resources exacerbate regional disparities in fiscal capacity between regions.

Jaime Bonet (2006) examined the impact of fiscal decentralization on regional income inequality in Colombia. By using interdepartmental panel data sets, it was found that the process of fiscal decentralization increased the regional income inequality.

Study by Rodriguez-Pose and Ezcurra (2010), entitled 'Fiscal Decentralization and Economic Growth in Central and Eastern Europe'. investigated the relationship between decentralization and regional inequality in developed and developing countries with 16 samples of Eastern European Countries for 1990-2004. The results of this study indicated that fiscal and political decentralization is completely cut off from the evolution of inequality between these regions. This means that there are constraints of fiscal and political institutional capacity where poorer regions confronted with rich, strong, or larger regions that receive a greater autonomy.

2. Methodology

2.1. Analysis of regional economic inequality in Indonesia

In measuring development inequality between regions the Theil Index is used as used by Akita and Alisjahbana (2002) in their studies conducted in Indonesia. An index is considered as a good measure of the inequality if it meets several criteria, such as, anonymity, mean independence, population-size independence, and the Pigue-Dalton principle of transfer (Shorrocks 1980). Seen from the criteria that must be owned by the index, Theil Index meets the criteria as an index that measures the income inequality in one region.

Following Akita (2003), the mathematical derivation of the calculation of economic inequality within and between regions is as follows:

$$T = \sum_{i=1}^{n} \left(\frac{y_i}{Y}\right) T_d + \sum_{i=1}^{n} \left(\frac{y_i}{Y}\right) log \left(\frac{y_i/Y}{n_i/N}\right) \tag{1}$$

$$T = \sum_{i=1}^{n} \left(\frac{y_i}{Y}\right) T_d + T_{BR} \tag{2}$$

$$T = T_{WR} + T_{BR} \tag{3}$$

Equation (3) shows that the regional T index inequality can be decomposed into two parts, namely inequality within region (TWR) and inequality between region (TBR), where:

$$T_{WR} = \sum_{i=1}^{n} \left(\frac{y_i}{Y}\right) T_d \tag{4}$$

2.2 Factor analysis of intergovernmental transfer that affect regional economic inequality

The next analysis is the analysis of main causative factors of the inequality of the region. This can be done by using the regression method of the index calculation results. In this case, the index calculation results are as the

dependent variable (the factor explained) and certain variables are as the independent variable (the explaining factor) with the following equation:

$$TI = \alpha_0 + \alpha_1 SPG + \alpha_2 GPG + \alpha_2 SR$$

(5)

where: TI - Theil index*;* SPG - specific purpose grant*;* GPG - general purpose grant*;* SR - shared revenue.

3. Research findings and discussions

3.1. Analysis of the current economic inequality between regions in Indonesia

In the introduction, one of the objectives to be achieved through this research was to look at trends and levels of economic inequality between provinces in Indonesia. Theil Index was used as the measurement of economic inequality as described in the methodology. The measurement of economic inequality between regions in Indonesia was calculated based on GRDP data per capita of 2010 from 2001-2017 in 33 provinces.
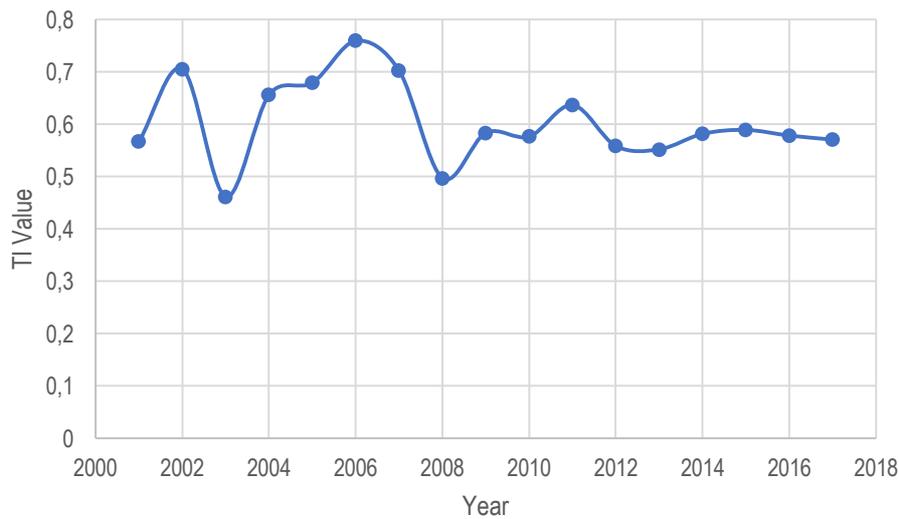
The results of Theil Index calculations from 2001 to 2017 can be seen in Table 1 If the index approaches 1, it means that development between regions is unequal, and vice versa, if the index approaches 0, it means that development between regions is equal. From the calculation results of Theil Index based on GRDP between provinces in Indonesia from 2001 to 2017, the total value of Theil Index ranges from 0.46 to 0.75. This indicated that development between regions (provinces) can be said to be inequal.

Table 1. Theil Index Based on GRDP Between Provinces in Indonesia from 2001 to 2017

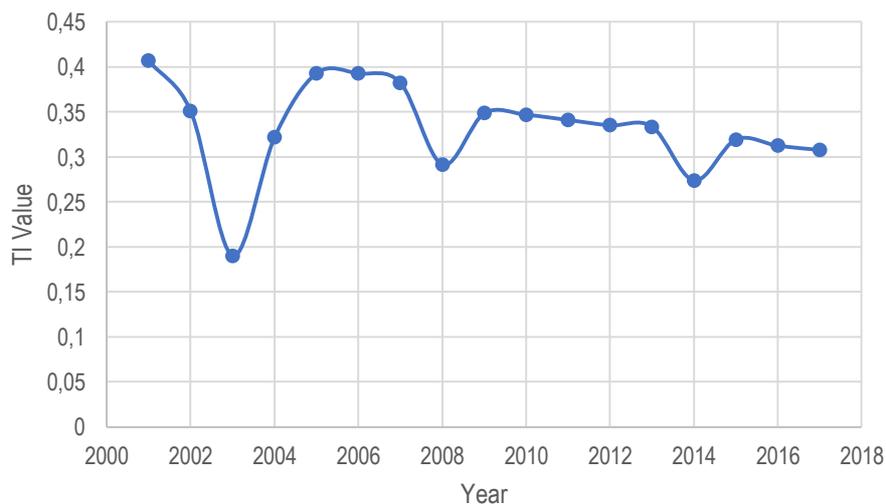| Year	Theil Index Inter	Theil Index Intra	Theil Index Total
2001	0.159834	0.406786	0.56662
2002	0.354179	0.350941	0.705119
2003	0.270926	0.18998	0.460906
2004	0.333904	0.32187	0.655774
2005	0.285687	0.393125	0.678812
2006	0.366005	0.39286	0.758865
2007	0.319416	0.382285	0.701701
2008	0.205139	0.291443	0.496582
2009	0.234429	0.348542	0.58297
2010	0.229249	0.346809	0.576057
2011	0.295138	0.341066	0.636204
2012	0.222728	0.335132	0.55786
2013	0.217972	0.333584	0.551557
2014	0.307416	0.273731	0.581148
2015	0.269208	0.319417	0.588626
2016	0.265465	0.312361	0.577826
2017	0.262332	0.307727	0.570058

Source: Research Result

Figure 1. Graph of Theil Index Total

As stated in methodology, the use of Theil Index as a measure of economic inequality between regions has certain advantages. The Theil Index can calculate inequality within the region and inequality between regions.

Figure 2. Graph of Theil Index Intra

If more emphasized on Theil Index intra (between provinces), it was found that Theil Index intra values are quite low but fluctuated from year to year. The highest inequality occurred in 2001 amounted to 0.406786 while the lowest occurred in 2003 amounted to 0.18998. In general, it can be stated the same amount of inequality almost happens every year, as shown in Picture 2.

Furthermore, Theil Index can also investigate inequality within the province using the Theil Index Inter calculation. The highest inequality occurred in 2006 amounted to 0.366005 and the lowest inequality in 2001 was 0.159834. Overall, the results of calculations show that the economic inequality between provinces in Indonesia in the last five years was still high. The average of Theil Index total value is 0.6, the Theil Index inter is 0.27, and the Theil Index intra is 0.33.

The second result is that the pattern of inequality between regions is caused by contributions from within and between the region. This indicated that there has been a development inequality within and between provinces in Indonesia.

Figure 3. Graph of Theil Index Inter
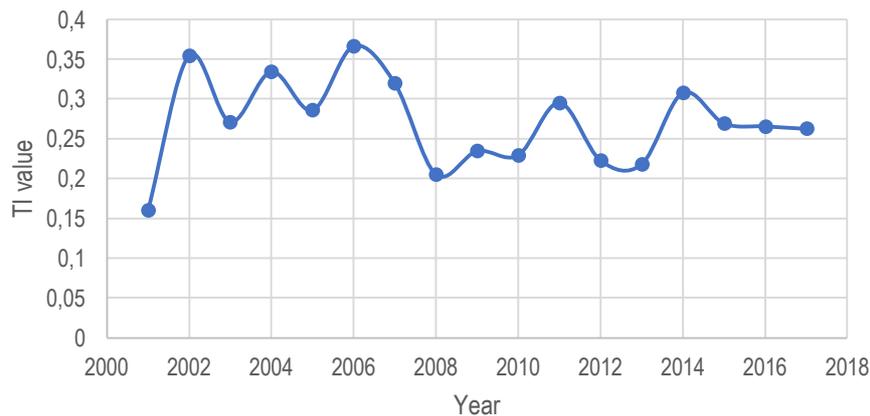
Source: Research result

3.2. Factor analysis of intergovernmental transfer that affect interregional economic inequality

In the introduction, the second objective in this study was to analyse what components of government investment allocation caused the inequality between regions. Thus, a regression analysis is performed between the Theil Index coefficients as the dependent variable and the variation of the intergovernmental transfer (general purpose grant, specific purpose grant, and shared revenue) as the independent variables.

Prior to be used, the model was tested whether it has a root unit or not. Then proceed with the classical assumptions test that underlie the analysis of the regression model used.

Classic assumption test includes:

- *Multicollinearity Test:* Tests the linear relationship between independent variables in the regression model. If there are symptoms of multicollinearity in a regression model, then the regression model cannot be used. If there is no VIF value greater than 10 or 5 (many books require no more than 10, but there is also a requirement of no more than 5), so it can be said that there is no multicollinearity in the two independent variables.

Table 2. ANOVA of SR, GPG, and SPG on TI

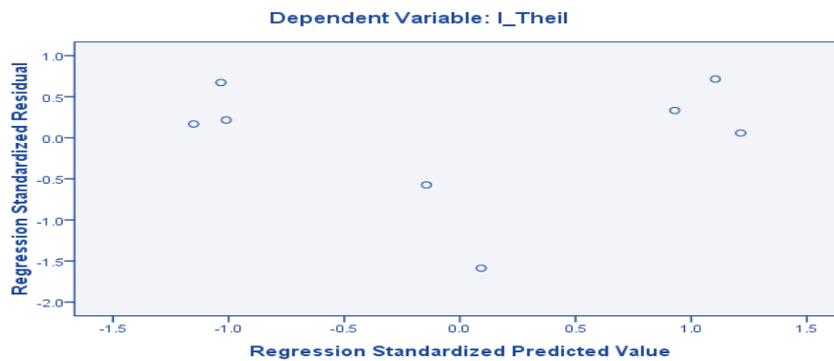| Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,665	,142		4,688	,009		
	SR	-4,326	,000	-,183	-,364	,0734	,846	1,182
	GPG	-1,604	,000	-,462	-,822	,0457	,677	1,477
	SPG	9,143	,000	,173	,331	,0757	,781	1,280

Note: a. Dependent Variable: Theil Index
Source: Research Result

Based on the classical assumptions of linear regression with OLS, a good linear regression model is free from multicollinearity. Thus, Table 2 obtained from the VIF value ranges from 1 is said to be free from the presence of multicollinearity.

- *Heteroscedasticity Test: It is a regression problem where the interference factor (error) does not have the* same variant (the variance is not constant) which causes the OLS estimator to be biased. Heteroscedasticity test is done by creating a Scatterplot (flow distribution) between residuals and predictive values of standardized dependent variables. Heteroscedasticity test results can be seen in Figure 4. From Figure 4, it can be seen that the distribution of points does not form a particular pattern/plot, thus it can be concluded that heteroscedasticity does not occur, or in other words, homoscedasticity occurs. The classical assumptions about heteroscedasticity in this model are fulfilled, which is free from heteroscedasticity.

Figure 4. Heteroscedasticity Test

Autocorrelation shows the correlation between members of a series of observations. If the model has a correlation, then the estimated parameters become biased and the variations are no longer minimum and the model becomes inefficient.

The Durbin-Watson listed in the SPSS output is called the calculated DW. This number will be compared with the acceptance or rejection criteria that will be made with the dL and dU values determined based on the number of independent variables in the regression model (k) and the number of samples (n). The dL and dU values can be seen in Table DW with a significance level of 5% (α = 0.05).

Table 3. Autocorrelation test

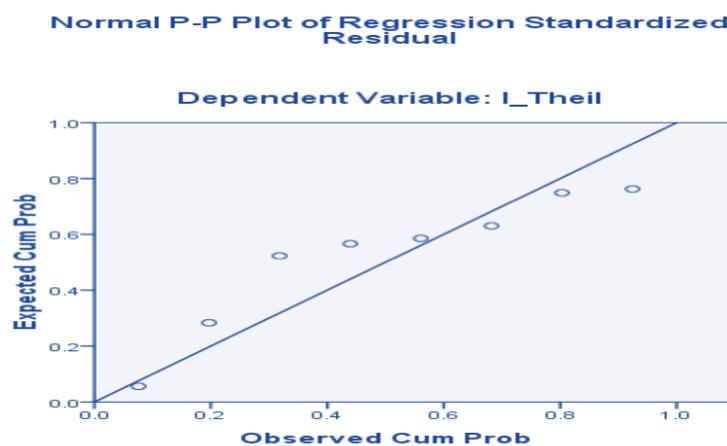| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
1	,782a	,146	-,495	,03152	,146	,227	3	4	,873	2,676

Note: a. Predictors: (Constant), GPG, SPG, SR; b. Dependent Variable: Theil Index

From Table 3, it can be seen that the Durbin Watson value of 2.676 indicated that there is no autocorrelation because the value of 2.676 falls in the area.

- *Normality*: it is used to determine whether residuals are normally distributed or not by using normal PP-Plot. If the distribution of points approaches a straight line, it can be concluded that the data used in the ECM model is normally distributed.

Figure 5. Normality test

From Figure 5, it can be said that the data has spread normally because most data are approaching a straight line.

Table 4. ANOVA with 3 independent variables

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,001	3	,000	,227	,073b
	Residual	,004	4	,001		
	Total	,005	7			

Note: a. Predictors: (Constant), SPG, SR, GPG
Source: Research Result

The analysis of variant (ANOVA) from Table 4 shows a regression model that uses three independent variables (SPG, GPG, SR) in investigating the causes of inequality based on the Theil Index. The result showed that the model used intergovernmental transfers (GPG, SPG and SR) can be used to study the causative factors of development inequality between regions (Provinces) in Indonesia.

Furthermore, by conducting a partial test of each coefficient and the assumptions test to investigate whether there is influence of intergovernmental transfer on economic inequality between provinces in Indonesia. Table 2 shows that at a significant level $\alpha = 10\%$, there are two independent variables of SR and GPG that significantly influence economic inequality in Indonesia because the Sig $<\alpha$ values are 0.0734 and 0.0457, while the SPG variable is not significant at $\alpha = 10\%$ at 0.0757. In order to analyse the effect of the overall intergovernmental transfer (GPG, SPG, and SR) on economic inequality between regions, a simple regression analysis model is used with TI as the response variable and the intergovernmental transfer as a predictor variable. The regression model as follows:

Table 5. Regression coefficient of intergovernmental transfer and Theil Index

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	,606	,046		13,274	,000
	Total	-5,857E-17	,000	-,234	-,589	,0577

Note: TI=0,921-1,603IT
Source: Research result

where: TI= Theil Index*;* IT= Intergovernmental Transfer

The analysis of the regression equation is: if 1% of intergovernmental transfer is given, it causes the Theil Index to decrease by 5.857. Table 5 shows that the intergovernmental transfer has a significant effect on development inequality at a real level of 5%.

Conclusion

After 15 years of Fiscal Decentralization in Indonesia, the tendency of inequality between regions has declined but is still relatively high, where the economic inequality measure used by Theil Index from 2001-2017 shows the value of Theil Index totals were ranging from 0.68 to 0.97. This condition shows that development between regions (Provinces) can be said to be very inequal. Inequality between regions is caused by contributions within and outside the region. Thus, it indicated that there is a development inequality both within and between the province in Indonesia. Inequality caused by internal influences is smaller than from outside provinces, where the Theil Index Intra is 0.3 while the Theil Index Inter is 0.49. Then it can be concluded that the intergovernmental transfer has not been able to create equality between regions in Indonesia.

The intergovernmental transfer component that affects economic inequality between regions are shared revenue and general purpose grant. The shared revenues have a negative effect, which increase the regional economic inequality, while the general purpose grants provide a positive effect which reduce economic inequality between regions. On the other hand, the specific purpose grant does not significantly affect economic inequality between regions.

Policies Implication

The inequality between provinces is caused by the influence from both within and outside provinces. It needs to propose a new policy for the intergovernmental transfer which pays more attention to the aspect of equity and allows the increasing of general purpose grants to regions that have small fiscal capacity.

Since the shared revenue has a negative effect on inequality between regions, new policies in the allocation of shared revenue must be proposed in order to reduce the percentage received by producing regions and give them to the surrounding regions thus equity can be better.

Because the effect of specific purpose grant is not significant, it is suggested that in the future SPG allocation will be given to certain regions, particularly border, coastal, disaster-prone areas and disadvantaged areas whose fiscal capacity is below the national average. SPG is only intended for regions where the achievement of minimum service standards is still below the national average, so that the recipient regions of this SPG will increase their capital capacity especially limited to three areas, namely the achievement of educational services, health services, and basic infrastructure based on proposal regions synchronized with national priorities.

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