Research Article

Tax Revenue Convergence Among Provinces in Indonesia

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Abstract

In the era of fiscal decentralization, the regional government carries out various efforts to increase regional revenues, especially regional taxes. However, inequality still occurs in regional development has an impact on the performance of local tax revenues. There are have been few studies on fiscal convergence in Indonesia. The purpose of this study was to determine and analyze the sigma convergence and beta convergence of provincial tax revenues in Indonesia. This study used panel data of 33 provinces in Indonesia with the period 2010-2017. The analysis method used sigma convergence and beta convergence. Variables used include tax revenue and per capita GRDP. The result of the study show that there is the existence sigma convergence of tax revenue. Both absolute and conditional convergence on tax revenue have not existed. GDP per capita has an insignificant effect on tax revenue. These result imply that during the era of fiscal decentralization, there was an imbalance in tax revenues between provinces in Indonesia.

Keywords: tax revenue, per capita GRDP, sigma convergence, beta convergence

INTRODUCTION

Fiscal policy is one of the important instruments used by the government to have an impact on the economy, one of it is taxation [1]. Tax is used to finance all government expenditures with the aim of improving people's welfare. Taxes are collected from the peoples and managed by both the central government and regional governments with different types of taxes.

Many countries have begun fiscal decentralization by shifting fiscal decision making from the central government to local governments to increase the level of accountability, public sector management, involvement of local stakeholders and service delivery for good governance [2]. Indonesia began fiscal decentralization in 2001, the central government provided incentives to local governments to reduce inequality horizontally and vertically [3].

In the era of fiscal decentralization, type of tax managed by the regional government is provincial tax and regency and city tax. Provincial tax revenues have large differences between regions. Some regions have large tax revenues and some regions have small tax revenues. Provinces on the island of Java have the largest provincial tax revenue compared to other provinces outside Java Island.

In 2017, East Java Rp 20,8 trillion, Jakarta Rp 19,9 trillion, West Java Rp 12,2 trillion, Central Java Rp 10,2 trillion, Banten Rp 5,4 trillion, and Yogyakarta Rp 1,4 trillion. Total tax revenue of all provinces on the island of Sumatra minus Riau up to Rp 11,8 trillion or even smaller than West Java. Tax revenue in Kalimantan Island is less than

Sumatra Island with Rp 8,5 trillion. Bali and Nusa Tenggara Island have Rp 4,9 trillion, Sulawesi Island Rp 5,82 trillion and lowest tax revenue in Maluku dan Papua Island up to Rp 1,9 trillion.

Each region has different potential tax revenues, if they have large potential tax revenue, it can also be categorized as a rich region, while they have the small potential for of tax revenues can also be categorized as a poor region. The poor regions will tried to catch up with the rich regions.

That term is similar as the concept of convergence by Barro & Martin [4], income of poor countries or regions will grow faster than the income of rich countries or regions so that the level of income convergence will be reached between the regions or countries. in the end the income of poor and rich countries or regions will be at the same income level. There are two concepts of convergence are sigma convergence and beta convergence. Sigma convergence measures the dispersion rate of per capita income the growth. If the dispersion of income tends to decreaseds, it can be said that the gap in income per capita between regions tends to decreased. Beta convergence is to determine the factors that influence in determine the level of convergence [4-5].

Research on convergence doesn't only focus on per capita income but can be linked to fiscal expenditures and taxes, which are examined by Sarue *et al* [6], Dekiawan [7], Laura-Ioana [1]. Sarue *et al* [6] stated that most of the government expenditure contributed by tax revenues and so that tax convergence is expected to occur and give impact to a convergence of government expenditure. Dekiawan [7] found that sigma convergence has occurred on tax revenue in 30 provinces in Indonesia during the period 2000-2012. The result of beta convergence estimation show that there was a beta convergence indicated by a a a negative value of β. Laura-Ioana [1] found that there were several sigma convergences of tax revenue in European Union Members, starts from 1997 until 2008.

However, there are have been few studies on fiscal convergence in Indonesia. Based on the background, This paper aimed to determine and analyze the sigma convergence and conditional convergence of provincial tax revenues in Indonesia.

II. RESEARCH METHODOLOGY

A. Data

This study used secondary panel data with a period of research years from 2010 to 2017. Secondary data includes tax revenue, per capita Gross Regional Domestic Product (GRDP) from 33 provinces in Indonesia, minus North Kalimantan which was formed in 2012. The data was collected from statistics indonesia and the ministry of finance the Republic of Indonesia. Tax revenue representss provincial tax revenue from each province in Indonesia. there are 5 types of provincial taxes; motor vehicle tax, a transfer fee of the motor vehicle, fuel tax, surface water tax, and cigarette tax. Gross Regional Domestic Product (GRDP) data from each province in Indonesia based on 2010 constant price.

B. Analysis of Sigma Convergence

One of the best-known methods of determining convergence or divergence is sigma convergence. Sigma convergence is determined using the measurement of the dispersion [4].

The indicator used is Coefficient Variation (CV) conducted by Dekiawan [7] and Laura-Ioana [1].

$$CV = \frac{(\frac{1}{n} \cdot \sum_{i=1}^{n}(Y_i - Y)^2)^{\frac{1}{2}}}{Y}$$

CV represents Coefficient Variation of an observed variable, Y_i representss fiscal variables that is the the growth of tax revenue, *Y* is the annual average the growth of tax revenue. *n* is the number of the object (33 provinces), and *i* represents each of the provinces. The CV will be calculated for each year. If CV tends to decline from 2010-2017, there is the existence of sigma convergence. But, f CV tends to increase, there is no the existence of sigma convergence.

C. Analysis of Beta Convergence

There is two types of measurement of beta convergence; (1) absolute convergence, (2) conditional convergence. To estimate the regression coefficient, this research used panel data regression with three estimation model; common effect model, random effect model, dan fixed effect model.

1. Absolute Convergence

Absolute convergence model in this research develop research model of Dekiawan [7]

$$Y_{TRit} = \beta_0 + \beta_1 Y_{TRit-1} + e_{it} \qquad (1)$$

Y_{TRit} representss the growth of tax revenue from each province, Y_{TRit-1} the growth of tax revenue from each province in the initial year, e is error term, i,t is province at time t. 7 If the regression coefficient is a a negative and statistically significant, this means that the variable tends to grow more quickly in regions that left behind at the initial of the period [8]. If coefficient β_1 Y_{TRit-1} is a a negative and significant, there is the existence of absolutee convergence of tax revenue.

2. Conditional Convergence

The independent variables consist the growth of tax revenue in the initial year and per capita GRDP which develop from Dekiawan [7]

$$Y_{TRit} = \beta_0 + \beta_1 Y_{TRit-1} + \beta_2 X_{it} + e_{it} \qquad (2)$$

Y_{TRit} represents the growth of tax revenue from each province, Y_{TRit-1} the growth of tax revenue from each province in the initial year, X_{it} e represents an explanatory variable that is per capita GRDP from each province , e is error term, i,t is province at time t. If coefficient β_1 Y_{TRit-1} is a a negative and significant, there is the existence of conditional convergence of tax revenue.

III. RESULT AND DISCUSSION
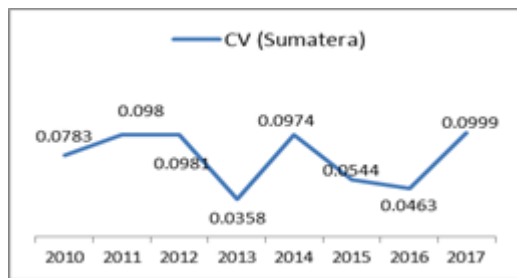
A. Sigma Convergence

Coefficient variation of tax revenue's the growth for all province in Indonesia during 2010-2017 are presented in figure 1

Fig. 2.1: Sigma Convergence of All Provinces In Indonesia, 2010-2017

Based on table 1 and Figure 1, CV tends to decline from 2010-2017. in 2010, the CV value was equal to 0,1379 and decrease slightly to 0,0923 in 2017. The CV decreaseds significantly from 2011-2012. Unfortunately, the CV tends to increase slightly from 2013 to 2015. In the period 2010-2011, some regions categorized as the poor regions have a low the growth of tax revenues reaching an average of 5-15 %. But, in 2012 the rich regions have lower tax revenue the growth than the poor regions. But, in the period 2013-2015, most the the poor regions have lower tax revenue the growth than the poor regions.

For Indonesian analysis, This trend showed that sigma convergence existed among 33 provinces in Indonesia from 2010-2017. This result concludess that the poor regions succeded to catch up in the growth of tax revenue from the rich regions. This result is in accordance with Laura-Ioana [1] which states the the existence of tax revenue convergence in the UE member state for a time period 1965 to 2012. For more detail result, the Coefficient variation of tax revenue's the growth also presented in six islands of Indonesia; Sumatera, Java, Kalimantan, Sulawesi, Bali & Nusa Tenggara, and Maluku & Papua. Figure 2.2 showed that Coefficient variation in Sumatera Island included 10 provinces.

Fig. 2: Sigma Convergence of Sumatera Island, 2010-2017

The CV in Sumatera Island tends to fluctuates from 2010 to 2017. in 2010-2013 tends to decrease slightly to 0,0358 and from 2013-2014 tends to increase slightly to 0,0974. But, the CV tends to rose in 2017. This result concludess that, tax revenue among Sumatera Island is the existence of sigma convergence.
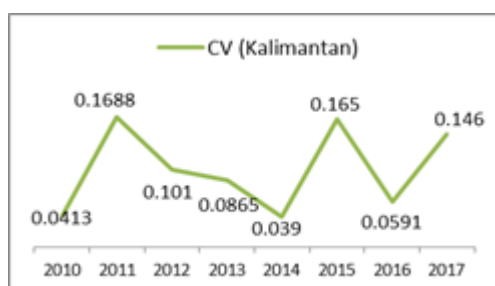
Figure 2.3 showed that Coefficient variation in Sumatera Island included six provinces.
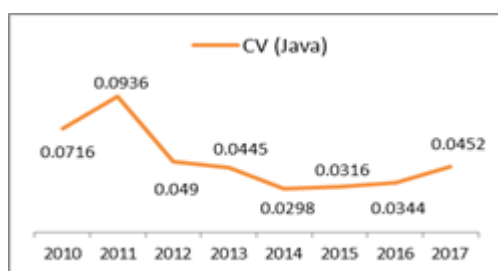
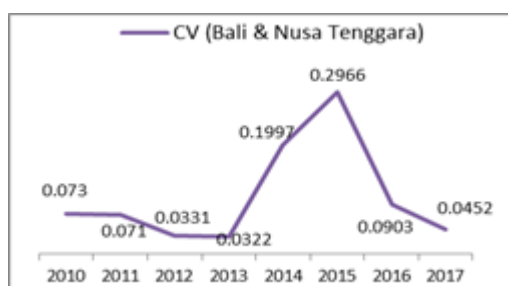**Fig. 2.3:** Sigma Convergence of Java Island, 2010-2017

The CV in Java Island tends to decrease. In the beginning, the CV increase slightly up to 0,0936 in 2011. In the priod 2012-2016, the CV tends to slightly to 0,0344. Unfortunately, in 2017 the CV rose to 0,0411. This result concludess that, tax revenue among Java is the existence of sigma convergence.

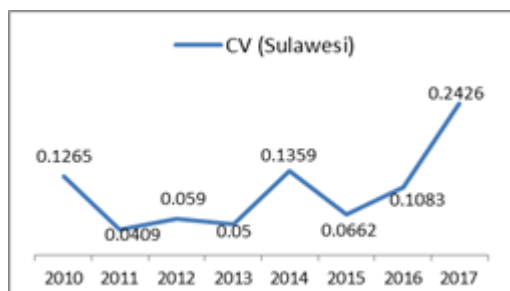Figure 2.4 showed that Coefficient variation in Kalimantan Island included four provinces.

Fig. 2.4: Sigma Convergence of Kalimantan Island, 2010-2017

The CV in Kalimantan Island tends to fluctuates from 2010-2017. In period 2010-2011, the CV increase significantly to 0,1688. Then, CV decrease slightly from 2012 to 2014. Then, CV rose to 0,146 in 2017. This result concludess that, tax revenue among Kalimantan Island is the existence of sigma convergence. Figure 2.5 showed that Coefficient variation in Bali & Nusa Tenggara Island included three provinces.

**Fig. 2.5:** Sigma Convergence of Bali & Nusa Tenggara Island , 2010-2017

In the period 2010-2013, the CV tends to decrease to 0,0322. But, the CV tends to increase significantly to 0,2966 in 2015. Fortunately in 2017, the CV decrease significantly to 0,0452. This result concludess that, tax revenue among Bali & Nusa Tenggara Island is the existence of sigma convergence. Figure 2.6 showed that Coefficient variation in Sulawesi Island included six provinces.

Fig. 2.6: Sigma Convergence of Sulawesi Island , 2010-2017

The CV in Kalimantan Island tends to increase from 2010-2017. In the period 2010-2013, the CV tends to decrease slightly from 0,1265 to 0,05. Unfortunately in the period 2014-2017, the CV tends to increase significantly from 0,1359 to 0,2426. This result concludess that, tax revenue among Sulawesi Island there is no the existence of sigma convergence.

Figure 2.7 showed that Coefficient variation in Maluku & Papua Island included three provinces.
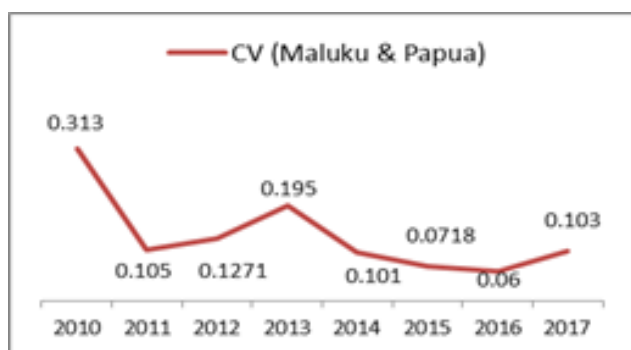
Figure 2.7. Sigma Convergence of Maluku & Papua Island , 2010-2017

The CV in Maluku & Papua Island tends to decrease from 2010-2017. In the period, 2010-2012, the CV tends to decrease slightly from 0,313 to 0,1271. Then, the CV rose in 2013 up to 0,195. Fortunately, in the period 2014-2017 the CV decrease slightly. This result concludess that, tax revenue among Maluku & Papua Island there is the existence of sigma convergence.

B. Panel Data Regression of Beta Convergence

1. Panel Data Regression of Absolute Convergence

Table 3.1 shows the estimation of fixed effect model to absolute convergence of tax revenue.

Table 3.1: Fixed effect model to absolute convergence of tax revenue

Variables	Coefficient (t-statistic)	Prob.
Y_{TRit-1}	0,978765 (74,01325)	0.0000
R-Square		0,995046
Adjusted R-Square		0,994335
F-Statistic		1399,806
Prob (F-Statistic)		0.0000
Observation		264

Based on the estimated panel data regression in Table 3.3 above, the coefficient of tax revenue in the initial year (Y_{TRit-1}) is a a positive 0,978765 and statistically significant at α =0,05 with probability 0.0000. This result shows that tax revenue in the initial year has a a positive and significant effect on tax revenue in the current year. This result indicate that if tax revenue in the initial year increases by 1%, it will increase tax revenue in the current year by 0,978765 %. Coefficient of tax revenue in the initial year (Y_{TRit-1}) is a a positive suggests there is no the existence of absolute convergence of tax revenue among Indonesian Provinces in Indonesia. The poor regions failed to catch up with the rich regions in tax revenue in the period from 2010 to 2017. This result the result of this study are different from Dekiawan [7] which found that there is the existence of absolute convergence Indonesia during the period 2000-2012.

2. Panel Data Regression of Conditional Convergence

Table 3.2 shows the estimation of fixed effect model to conditional convergence of tax revenue.

Table 3.2: Fixed effect model to absolute convergence of tax revenue

Variables	Coefficient (t-statistic)	Prob.
Y_{TRit-1}	0,958286 (44,76101)	0.0000
X_{it} (per capita GDRP)	11.87381 (1,215584)	0,2254
R-Square		0,995077
Adjusted R-Square		0,994347
F-Statistic		1361,500
Prob (F-Statistic)		0.0000
Observation		264

The coefficient of tax revenue in the initial year (Y_{TRit-1}) is a a positive 0,958286 and statistically significant at α =0,05 with probability 0.0000 based on table 3.6. This result shows that tax revenue in the initial year has a positive and significant effect on tax revenue in the current year. This result indicate that if tax revenue in the initial year increases by 1%, it will increase tax revenue in the current year by 0,958286 %. Coefficient of tax revenue in the initial year (Y_{TRit-1}) is a positive suggests there is no the existence of conditional convergence of tax revenue among Indonesian Provinces in Indonesia. This result are different from Dekiawan [7] which found that there is the existence of conditional convergence in Indonesia during the period 2000-2012.The poor regions failed to catch up with the rich regions in tax revenue in the period from 2010 to 2017.This result also indicate that there is no the existence both of absolute and conditional convergence of tax revenue among Provinces in Indonesia.

The coefficient of per capita GRDP is a a positive 11.87381 and statistically insignificant at α =0,05 with probability 0,2544 based on table 3.7. This result shows that there is no effect of per capita GRDP to tax revenue. This result are different with Dekiawan [7] which found that there is an impact of the growth of per capita GRDP to tax revenue Indonesia during the period 2000-2012. Per capita GRDP failed to support conditional convergence of tax revenue in Indonesia during the period 2000-2012. This result can be contributed by huge imbalance of Per capita GRDP among Provinces in Indonesia. There are several reasons that cause no existence absolute and conditional convergence of tax revenue among Indonesia Province in Indonesia; (1) the rich regions still dominated the economy, such as Java and Sumatra Islands. These islands have large economic transactions which has the potential to absorb more tax revenues. (2) the poor regions still failed to manage the potential of human resources and natural resources. (3) the poor regions have no innovation in tax intensification and extensification policies. (4) the poor regions have had minus tax revenue the growth in recent years.

IV. CONCLUSIONS

The Coefficient variation (CV) of tax revenue tends to decrease slowly from 2010 to 2017. This trend indicate that sigma convergence existed among 33 provinces in Indonesia from 2010-2017. This result concludess that the poor regions are to catch up the rich regions in tax revenue. Coefficient of tax revenue in the initial year (Y_{TRit-1}) is a a positive and also statistically significant in the measurement of absolutee and conditional convergence. This result indicates there is no the existence of absolutee and conditional convergence of tax revenue among Indonesian

Provinces in Indonesia in the period 2010-2017. Per capita GRDP is failed to contributed conditional convergence of tax revenue. There was a huge imbalance of Per capita GRDP among Provinces in Indonesia.

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