

FISCAL DECENTRALIZATION AND REGIONAL DISPARITIES IN INDONESIA: A DYNAMIC PANEL DATA EVIDENCE¹

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Abstract

The public sector decentralization advantages and disadvantages are widely discussed in economics and political science. While some economists argue that decentralization leads to an optimal provision of public services and a promotion of economic growth, others emphasize the dangers of competition associated with decentralization between sub-national governments especially for interregional redistributive reasons. This research studies empirically the impact of fiscal decentralization on regional disparities using dynamic panel data for 33 provinces in Indonesia from 2001 to 2008. Fiscal decentralization is represented by revenue decentralization (revdec) and regional disparity by gini coefficient. The major result of this study is that a high degree of decentralization is connected with low regional disparities. Hence, poor regions have no disadvantages from decentralization, quite the contrary.

Keywords: *decentralization, regional disparity, inequality, dynamic panel data evidence*

INTROCUCTION

There has been an increasing interest in the organizational structure of government in Indonesia since the 1990s and 2000s. The main question is whether it is advantageous to give local governments more authority and autonomy or whether it is better to make decisions at the central level of government. Lessmann (2006) propose assigning more competencies to the local governments especially in cases of levying own taxes. On the one hand, it is argued that an increase in competition between local jurisdictions would lead to a more efficient provision of public goods and, thereafter, a promotion of economic growth. Hence, the capabilities of

local government to design and conduct their authorities will occupy important roles.

Fiscal decentralization-as one of local government authorities-has three objectives, that are: (i) to decrease fiscal disparities among regions, (ii) to provide public goods and services better and more efficient, last (iii) to get closer between government and society. However, those ojectives are difficult to reach since both of local decentralization regulations, UU No. 22/1999 and UU No. 25/1999 were designed by two different institutions which caused biases and disorders (Siddik, 2009).

The question of the optimal degree of decentralization is also very important for all

countries not only in Indonesia, which tends to centralize more and more authorities in supranational institutions. While the allocation aspect of decentralization, particularly the connection between growth and federalism, has been analyzed in several studies, but the impact of decentralization on regional disparity has been studied rarely. Most of the existing empirical works are case studies of a single country (e.g. Akai & Sakata (2004) for the USA, Bonet (2006) for Colombia, or Kanbur & Zhang (2005) for China. As shown in section 2, the impact of decentralization on regional disparity within countries is ambiguous in these empirical studies as well as in the theoretical literature. The aim of this paper is to contribute new empirical insights to this question, derived from different econometric methods. For this purpose we create a panel data set for 33 Local Government Indonesia from 2001 to 2008.

The main advantage of this approach is the possibility of analyzing specific effect of regional institution in Indonesia. In the context of the present article, we interpret decentralization as real decentralization. Real decentralization does not reflect the legal structure of a federation only, because the real autonomy and authority power of local jurisdictions is better reflected by their financial powers. Even if a local government is legally autonomous, there could be a lack of factual autonomy when not having adequate financial powers. The paper is structured as follows: section 2 briefly reviews the theoretical and empirical literature dealing with the interactions between decentralization and regional disparities. In section 3, we discuss several different measurement concepts of regional disparity and fiscal decentralization. The data is introduced in section 4 and we also subsequently set up the estimation approach and discuss the obtained results. In the last, section 5 summarizes both results and conclusions.

THEORETICAL AND EMPIRICAL ANALYSIS

1. Previous Theoretical Research

Neoclassical Growth Theory, New Growth Theory or New Economic Geography, Ludema & Wooton (2000) argued that the heterogeneity between regions is driven by migration, trade, knowledge spill-over effects, economies of scale, externalities, and other factors. Besides these aspects, the institutional design of countries, particularly a federal or unitary constitution, exerts influence on the differences in regional development, but the direction is ambiguous. As cited earlier, Prud'homme (1995) in Lessmann (2006) expects an increase of disparities under inter-jurisdictional competition, because richer and poorer regions have different powers to tax, and, therefore, poorer regions have to levy higher average tax rates than richer ones. This results in a vicious circle where poorer regions are getting poorer and richer regions being richer, since the poorer has lack of fund resources. Following these arguments, fiscal competition should be eliminated by centralization, harmonization or a redistributive grant system.

Decentralization as a commitment device and suggest that regional disparities may be related to the efficiency of public services. The authors focus on the incentive effects from decentralization on local governments. With centralized budgets, bailout policies for the ex post poor region through the redistribution of resources from the central government may soften its budget and distort the ex ante incentive of regions to escape from getting poor with some costly effort. Therefore, decentralization might be able to reduce regional disparities.

Then, Anderson & Forslid (2003), Baldwin & Krugman (2004) analyze the impact of fiscal competition on development in core and peripheral regions from the perspective of the New Economic Geography.

These studies emphasize that decentralization especially in terms of tax competition is an important instrument for helping peripheral regions compete with core regions for mobile factors. In core regions, the advantages of agglomeration permit governments to levy higher taxes than in peripheral regions.

A good example is provided by Feld & Dede (2005): Northern Italy as a core European region offers an excellent infrastructure, close markets, and highly qualified human capital so that the high Italian tax burden is possible. Ireland for example, as a peripheral region, does not have the advantages of agglomeration, and only a mix of low tax rates and public services remains to balance their local disadvantage. Centralization and harmonization would withdraw one of the only instruments of the peripheral regions to compete with core regions for mobile factors and would be harmful for regional development. This example could easily be assigned to the intrastate case. In numerous countries a redistribution system exists between different regions for diminishing regional disparities. However, it is unclear in how far such transfers are effective for this purpose.

Feld & Dede (2005) argue that on the one hand grants could give underdeveloped regions the scope they need for investments in infrastructure and human capital. On the other hand, it is doubtful whether they use transfers effectively. It is also possible that instead of investing in growth stimulating factors, the payments are used for consumption and support of the not competitive local industry. Hence, the necessary structural change becomes paralyzed and the economic backwardness is sustained.

2 Previous Empirical Research

The impact of decentralization on regional disparity is theoretically ambiguous and, therefore, empirical research is necessary to judge which effects are dominant. While several single country studies have been

carried out (Akai & Sakata (2004), Kanbur & Zhang (2005), and Bonet (2006)).

Using data for Korea (1971-1997), Kim *et al.* (2003) conclude that a high degree of decentralization is associated with high inequalities. As the authors use the spatial distribution of public services as measurement for decentralization, the results have to be interpreted with caution. Akai & Sakata (2004) analyzed US state level panel data and found a negative impact of decentralization on regional inequalities incorporating local government authorities as well as autonomy. Kanbur & Zhang (2005) show that decentralization led to higher regional inequalities in Chinese provinces throughout the period 1952-1999.

Bonet (2006) analyzes a panel data set of Colombian departments from 1990 to 2000 and finds a negative impact of fiscal decentralization on regional income distribution. A country comparison is contributed by Shankar & Shar (2003), who found ambiguous results in several developed and developing countries. The disadvantage of this study is that for several countries that used time series are very short and decentralization is not measured by financial accounts but only by a classification in unitary and federal states.

Our empirical analysis is based on the work of Akai & Sakata (2007) with a focus on a single country. For this approach a panel data set of Indonesia Local Government is generated, while Akai & Sakata (2007) used data of US states. Their approach has the advantage of analyzing relatively homogeneous regions within the US states on a widely equal development stage, but they cannot reject that the connection of decentralization and disparities is US-specific and, therefore, these results can only be generalized for other countries with caution. In contrast to the work of Akai & Sakata (2007), our dataset allows more general interpretations on a wider data basis, considering more sophisticated

measures for regional disparity as well as fiscal decentralization.

MEASUREMENT CONCEPTS FOR DECENTRALIZATION AND REGIONAL DISPARITIES

Completing our empirical analysis we are in need of adequate measures of decentralization and regional disparity. Various concepts of measuring decentralization and disparity are possible. This section discusses the different measurement concepts applied in the literature and evaluates the most appropriate measures for our analysis.

1. Measurement concepts of decentralization

Several different measures have been used in the literature. We are interested in how much authority and autonomy in decision making local governments have compared to the central government. One possibility for the measurement of decentralization is to design indicators for the vertical government structure considering laws and institutions. But as we are in our paper not interested in the de jure decentralization but the de facto decentralization, we focus on the decentralization of financial resources within a country. For this purpose most empirical studies rely on the share of local government expenditure (or revenue) to general government expenditure (or revenue). For reasons of comparability with former empirical work, we adopt the following measures: degree of expenditure decentralization (expdec) and degree of revenue decentralization (revdec). Note that social expenditures (or revenues) are not considered in these decentralization measures, because we are not interested in studying interregional redistribution via social security funds. Oates (1972) in Lessmann (2006) discusses the limitations of such "classical" decentralization measures. He basically argues that these measures do not always represent the actual degree of decentralization, because

it is important to consider the autonomy of local government decisions on their expenditures or revenues.

A simple example illustrates this problem. In the case of German states (Bundesländer) the degree of revenue decentralization is very high compared to unitary countries. But in fact, local governments have only very limited possibilities of levying own taxes. Most German taxes are composite taxes and the main legislation is assigned to the central government. Hence, the degree of decentralization is very high if the sub-national government autonomy is not taken into account. If such an advanced degree of revenue decentralization is calculated, a federal system of the German cooperative type appears much less decentralized. Ebel & Yilmaz (2003) show that the results of former empirical studies on fiscal decentralization depend considerably on the applied decentralization measure. The authors replicate previous studies and detect in some cases reversed results. In order to study the stability of the results and to get comparable results to previous studies, we use the classical measurement of decentralization.

$$\text{REV DEC} = \frac{\text{state government - revenues} + \text{local government - revenues}}{\text{consolidated total government revenues}} \dots(1)$$

The advantage of this measure is that it approximately indicates the degree of tax competition between local governments. With these two different classes of decentralization measure, the classical decentralization measure (revdec), it is not only possible to measure whether a country is more federal or more unitary constituted, but also to distinguish between cooperative and competitive federal structures as well as local government authority and autonomy. In the following estimations we consider all these

measures and investigate their impact on regional disparities.

2. Measurement concepts of regional disparity

The measurements of regional disparity are used in various concepts. Three different problems arise while measuring disparity: First, we have to choose an appropriate economic indicator as basis for the calculation, second we must define the territorial level, and third we must select an applicable concentration measure. Shankar & Shar (2003) focus on per capita income. However, this measure has the disadvantage that the income per capita also covers the benefits from the social security system. But we focus not on individual redistribution in this paper.

Therefore, the effects of such redistributive instruments should be excluded as far as possible. Another possible starting point is the gross domestic product per worker as used by Canaleta *et al.* (2002). But this measure also has its drawbacks. Due to unequal employment between the compared regions, a bias could emerge that distorts the disparity measure. Furthermore, for several countries this sort of data is not available. In this article we use the gross domestic product per capita (GDP p.c.) as input variable following the Central Statistic Agency of Indonesia. However, also the GDP per capita as economic basis has its drawbacks. The largest problem arises from the existing commuters between local jurisdictions.

In several regions, there are agglomeration centers where a lot of people are employed, but after work they commute to another jurisdiction. Because in this case the production is high within the agglomeration center but the population is small, a disparity measure based on the GDP p.c. is biased. Furthermore, disparity measures could be elaborated which consider the unequal distributed population and control variables are included in the regressions capturing the

distribution effect. The third question to be discussed is which concentration measures are applicable for the measurement of regional disparities. Different measures of inequality do not always provide the same country disparity ranking.

There are different requirements that a measure has to satisfy, especially in cross-country comparisons. Firstly, the measure should be independent from the number of regions, and secondly the measure should be non-sensitive to shifts in average GDP p.c. levels. Often used disparity measures include the standard deviation, the standard deviation of the natural logarithms, the coefficient of variation, the adjusted Gini coefficient, the Herfindahl Index, and the Theil Index of inequality. All these measures represent the concentration of GDP p.c. within a country and satisfy the Pigou-Dalton transfer principle, that is, a transfer from richer to poorer regions reduces inequality.

An appropriate disparity measure is adjusted gini coefficient (*adgini*) which has same properties as the coefficient of variation:

$$\text{adgini} = \frac{2 \sum_{i=1}^N i \frac{\text{GDP}_i}{\text{pop}_i}}{N \sum_{i=1}^N \frac{\text{GDP}_i}{\text{pop}_i}} - \frac{N}{N-1}, 0 \leq \text{adgini} \leq 1 \quad \dots(2)$$

Where GDP= Gross Domestic Product, Pop= Population, N= Numbers, i= year.

EMPIRICAL RESULT

In this section, we focus on analyzing the relationship between fiscal decentralization, regional disparity, and the interaction between both two measures. However, it is necessary to consider several control variables in the estimation equations for getting reliable results. The former two sub-sections of this chapter give an overview on the diverse variables and provide some descriptive statistics. The

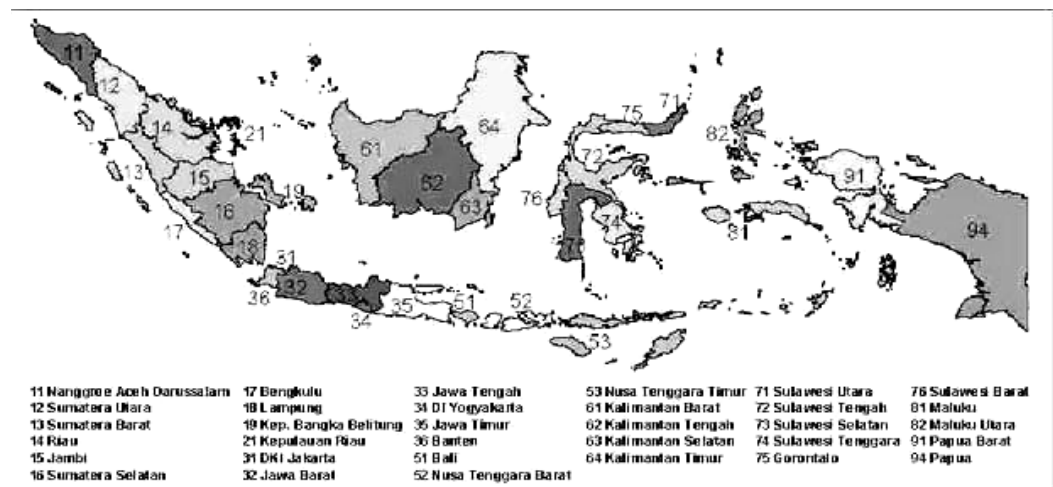
following sections present the estimation approach and discuss the obtained results.

1. Data Source

In order to analyze the interaction between fiscal decentralization and regional disparity, we have compiled the different disparity measurement from several local government statistics, that is the 33 provinces in Indonesia. Those are Nanggroe Aceh Darussalam, Sumatera Utara, Sumatera Barat, Riau, Jambi, Sumatera Selatan, Bengkulu, Lampung, Kepulauan Bangka Belitung, Kepulauan Riau, DKI Jakarta, Jawa Barat, Jawa Tengah, DI Yogyakarta, Jawa Timur, Banten, Bali, Nusa Tenggara Barat, Nusa Tenggara Timur, Kalimantan Barat, Kalimantan Tengah, Kalimantan Selatan, Kalimantan Timur, Sulawesi Utara, Sulawesi Tengah, Sulawesi Selatan, Sulawesi Tenggara, Gorontalo, Sulawesi Barat, Maluku, Maluku Utara, Papua Barat, Papua. Map spread of those provinces is displayed in Figure 1.

Other researchers use concentration measures of income per capita instead of GDP per capita for provinces where required data is missing, but this leads to inconsistent results.

A consistent interpretation of the results of such analysis with mixed dependent variables is impossible. The other important variables are the different decentralization measures. The "classical" ones (revdec) could be derived from the Trend of selected socio-economic Indicator of Indonesia. Actually it is possible to calculate them for 33 provinces. As we use panel data techniques, we need long time series which are available for considerably less provinces. The other decentralization measures (revdec) follow the IMF framework and could be calculated from the province revenue statistics. Hence, our analysis could only consider provinces. In addition to the measures for decentralization and regional disparity as the main variables of interest, there are several important control variables, which presumably have an impact on regional disparities and, therefore, have to be considered in the estimation equation, the unemployment ratio (unempl), and the populations size (pop) are also included in the model to capture political influences and regional size effects following Akai & Sakata (2004). As we use several variables from different data sources, the regarded period in our analysis is limited by data availability. Hence, we



Source: www.seasite.niu.edu (2006).

Figure 1. Map Spread of 33 Provinces in Indonesia

consider the years 2005 to 2008 for the mentioned 33 provinces.

2 Estimation approach

The present section explains the investigation approach which includes, apart from the different decentralization measures, other possible determinants of regional disparity. The hypothesis of an impact of fiscal decentralization on regional disparity is tested by panel data of 33 provinces covering the period from 2001 to 2008. In the regression analysis the provinces and time specific coefficient of variation of regional GDP per capita as measure for regional disparity is related to the discussed measures for decentralization, while controlling for other variables determining the economic differences between the regions of a single province. The model is estimated with province fixed effects in order to capture all unobserved time-invariant province-specific factors, such as geographic area, institutions, interregional heterogeneity, or traditions. A panel data approach with fixed effects focuses time variation in the data - in contrast to pooled cross-section analysis. Moreover, this proceeding allows to eliminate the problem of endogeneity and it is possible to control for unobserved province characteristics. The basic estimation equation could formally be written as:

$$\text{Disparity}_{i,t} = \beta_{0i} + \beta_1 \cdot \text{Pop}_{i,t} + \beta_2 \cdot \text{Gdppc}_{i,t} + \beta_3 \text{Unempl}_{i,t} + \beta_4 \cdot \text{Decentr}_{i,t} + \varepsilon_{i,t} \quad (3)$$

β_{0i} captures the province autonomous effects, $\text{Disparity}_{i,t}$ denotes the regional disparity¹ of province i in period t predominantly measured by the coefficient of variation (cov), while $\text{Decentr}_{i,t}$ represents the different

measures for fiscal decentralization. In the basic estimation the impact of the different decentralization measures on regional disparity is estimated separately, further regressions combine the measures for sub-national government authority and autonomy. In the context of the theoretical background discussed in section 2, decentralization could have a positive or negative impact on regional disparities. Following the arguments of Prud'homme (1995) a positive sign has to be expected for the decentralization measures. In contrast to this hypothesis, decentralization works as a commitment device, hence decreasing regional disparities and a negative sign will occur.

3 Dynamic Panel Estimations

To analyze the dynamic nature of the influences of the explanatory variables over time, we estimate this relationship in a dynamic model. A dynamic panel data model without first differencing cannot be consistently estimated with OLS or fixed effects estimator due to fact that the error term is correlated with the lagged dependent variable on the right hand side of the equation. Lessmann (2006) provide a solution for this problem. A dynamic panel data model could be estimated consistently and asymptotically efficient via first-differencing which leads in our case to an estimation equation of the type:

$$\begin{aligned} \text{Disp}_{i,t} - \text{Disp}_{i,t-1} = & \beta_0 \cdot (\text{Disp}_{i,t-1} - \text{Disp}_{i,t-2}) + \\ & \beta_1 \cdot (\text{Pop}_{i,t} - \text{Pop}_{i,t-1}) + \\ & \beta_2 \cdot (\text{Gdppc}_{i,t} - \text{Gdppc}_{i,t-1}) + \\ & \beta_3 \cdot (\text{Unempl}_{i,t} - \text{Unempl}_{i,t-1}) + \\ & \beta_4 \cdot (\text{Decentr}_{i,t} - \text{Decentr}_{i,t-1}) + \\ & \varepsilon_{i,t} - \varepsilon_{i,t-1}. \end{aligned} \quad (4)$$

The equation is estimated with a Generalized Method of Moments (GMM) procedure. First-differencing eliminates the fixed effects and lagged levels of dependent variables are used as instruments. However,

¹ We use equation of adjusted gini ratio (eq 2) developed by Pigou-Dalton, that is, a transfer from richer to poorer regions reduces inequality

Table 1. Dependent Variable: Adgini

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.383948	0.007204	53.29846	0.0000
GDPPC(-1)	1.73E-07	3.42E-07	0.507203	0.6139
POP(-1)	2.37E-09	5.33E-10	4.441876	0.0000
LOG(UNEMPL(-1))	-0.034681	0.003909	-8.871331	0.0000
REVDEC(-1)	-1.12E-10	4.12E-11	-2.714341	0.0087
Adjusted R-squared	0.996295			
S.E. of regression	0.040189			

(Sources: Processed Data)

for its consistency the GMM estimator requires a lack of second order correlation for the disturbances. The dynamic equations are estimated with robust standard errors. The authority and autonomy decentralization measures are negatively associated with regional disparities, if the coefficient of variation is considered as dependent variable on a 10 and 5 percent confidence level respectively. However, for the adjusted Gini coefficient and the weighted coefficient of variation as alternative disparity measures, only the autonomy measures have a significant impact on disparities.

The estimation shows that REVDEC, unemployment, and population have a significant impact to adjusted Gini, which REVDEC as main indicator then population and unemployment as sub-indicator. A high degree of REVDEC will decrease the adjusted Gini, vice versa. So therefore, in order to decrease disparities among regions, local governments should increase their revenue decentralization.

CONCLUSIONS

Negative redistributive effects of fiscal decentralization are a major argument against decentralization in the scientific and public discussion in the context of recent public reforms. However, theoretical and empirical findings on this question are ambiguous. The aim of our paper was to analyze the impact of fiscal decentralization on regional disparity. Former research found that decentralization is

harmful for some country such as Colombia as shown by Bonet (2006). But we have the same line as Akai & Sakata (2007) finding that fiscal decentralization is mild enough for income distribution in Indonesia.

We have discussed, calculated, and applied different measurement concepts for real decentralization as well as regional inequality in several estimations. Static as well as dynamic panel regressions have shown that provinces with a high degree of decentralization exhibit small regional disparities. This result also holds for different disparity measures as well as different decentralization measures. In a second step the estimation equations have been modified to be able to distinguish between the effects of local government authority in decision making and local autonomy over revenue sources. Hence, we find that decentralization is not harmful for the distribution between the regions of a country, quite the contrary, fiscal decentralization especially in terms of a high local government autonomy can lower regional disparities.

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