IS THERE ANY FISCAL COMPETITION AMONG LOCAL GOVERNMENTS IN INDONESIA AFTER FISCAL DECENTRALIZATION?

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ABSTRACT

Spatial interaction among local governments in fiscal setting decisions is receiving increasingly attention in the applied public economics literature. Spatial interaction models rely on the presence of an externality from local budget making, that is external effects originate from inter-jurisdictional resource flows due to tax competition for a mobile base, or from local public expenditure spillovers into neighboring jurisdictions. Similarly, the intergovernmental grants competition exists when there is a rivalry among local governments to get them from central government.

This paper attempted to identify how great the fiscal competition among local governments in Indonesia. Using spatial statistics, we concluded that the fiscal competition among municipalities was greater compared to the pre fiscal decentralization period. It seems that the local tax setting and expenditures decisions in a particular municipality can be attributed to the mimicking behavior to neighbor regions. Also, we found that the fiscal competition among municipalities could be attributed negatively to the fiscal disparity. Those imply that in the regional autonomy era the local governments tend to increase their local own revenue intensively and demand for intergovernmental grants in order to finance their expenditures. In the long run, they could lead to the high cost economy, worsening fiscal dependency, and inefficiency of local government expenditures. Those findings above suggest that the distribution of intergovernmental transfers among regions should consider the local tax effort and the services minimum standard plays an important role to achieve the efficiency of local government expenditures.
I. Introduction

Externalities have played an important role in the public economic literature. For example, roads, public transportation, recreation, and cultural facilities are visited, and therefore crowded, by residents in nearby jurisdictions. Crime fighting in one jurisdiction could either lower regional crime, or push criminals into neighboring communities. Air pollution controls and sewage treatment enhance the environment quality of bordering jurisdictions. Radio and TV broadcasts can be seen away from the local border. Educational and job training expenditures may translate in productivity gains in workplaces outside the community.

In the case of the efficiency of local public goods provision, benefit spillovers or inter-jurisdictional externalities are a widespread feature of many services provided by local governments (Wilson, 1986, 1999). The significance of spillovers is widely recognized in the fiscal federalism literature (see: for example Oates, 1972; 1999). The general conclusion of this strand of literature is that externalities tend to cause a divergence between private and social costs and benefits, and thus lead to suboptimal decision-making. Some authors have also worried about the equity consequences of spillovers (see, e.g., Ladd and Yinger, 1994), but also relating to the design of ‘needs-based’ equalization grants (Bramley, 1990). The general policy prescribed to deal with them is to decentralize decision making to the lower layer of governments.

Indonesia provides a unique opportunity to examine the nature of inter-jurisdictional externalities within a country consisting of central, provincial, and local levels of government. Since her independence in 1945, the administration of the country’s regional public services operated through a hierarchical and parallel system of de-concentrated central government agencies and ostensibly autonomous sub-national governments. Throughout most of its history, Indonesia’s system of regional government administration has been among the most centralized in the world (see for example Davey, 1989) and then drastically decentralized since 2001. Given the significance of inter-regional redistribution performed by the tax transfer system and equalization payments, whether a particular local government engages a strategic interaction with other local governments in the surrounding areas is a key political and economic issue.
Strategic interaction in setting local taxes and expenditures are two forms of the fiscal competition among local governments beside intergovernmental grants competition. Basically, tax setting and expenditure policies in a one region might affect to other regions policies. The root problem of those phenomena is the existence of spatial correlation among local governments. In the broader sense, inter-jurisdictional competition can be defined as rivalry among governments in which each government is trying to win some scarce beneficial resource or in which each government is seeking to avoid a particular cost (Kenyon, 1997).

In developed countries, a number of empirical studies concerning the issue have been conducted (see for example: Gordon, 1983; Wildasin, 1986; Salmon, 1987; Case et al., 1993; Kelejian and Robinson, 1993; Besley and Case, 1995; Brueckner, 1998; Heyndels and Vuchelen, 1998; Figlio, et al., 1999; and Bivand and Szymanski, 1997; 2000). Unfortunately, they tested the fiscal competition partially focusing on either tax or expenditure aspects. In contrast, the similar studies focusing on the issue in the case of developing countries are rarely. Some studies in Indonesia have been generally concentrated to the fiscal imbalance between central and local governments (see for example: Uppal and Suparmoko, 1986; Bawazier, 1988; Akhmad, 1990; Kuncoro, 1995; Indonesia Forum, 2000, Sidik, 2001).

Our approach is in the same spirit, although it has three significant differences. First, we employ spatial statistics method to identify the fiscal interdependency including tax, expenditures, and subsidies among municipalities comprehensively. Second, instead of using a single fiscal regime, we compare the fiscal interdependency among local governments in the pre- and post-decentralization periods. Finally, we identify the relationship between fiscal interdependency and fiscal equity (disparity) across local governments. The rest of this paper is organized as follows. Section 2 briefly summarizes of the existing literature. Section 3 highlights the previous results. The methodology is described in the next section. Reporting the main empirical results follows this. Finally, some concluding remarks are drawn.
II. Theoretical Consideration

The earliest idea of inter-jurisdiction competition (IJC) was delivered by Tiebout (1956). The key actors in his model are individuals (consumer-voters) who decide which of many local governments to locate in, based on their demands for government services and the public service/tax packages offered by the various governments. Tiebout assumes that individuals have full knowledge of the various government revenue and expenditure packages; that individuals may choose among a large number of communities; and that individuals are fully mobile. Furthermore, he assumes that no intercommunity spillover effects are and that each community is able to attain its optimal size at which the average cost of production its particular package of public services is minimized.

To the extent that Tiebout’s rather restrictive conditions are met, goods and services provided by suburban local governments will exhibit both allocative efficiency and productive efficiency. In Tiebout’s model, local taxes are benefit taxes, proportional to the benefits from government services received by households, rather than taxes based on ability to pay. No redistribution of income takes place in his system of local governments. The Tiebout’s model can be criticized for its restrictive assumptions. A crucial shortcoming of his model is that it does not include business firms, so that it is not particularly helpful in illuminating the phenomenon of IJC for economic development.

The Oates-Schwab model (1991) focuses on the mobility of capital rather than of households. They assume that the local government’s objective is to maximize the welfare of its constituents, subject to the applicable budget constraints. They also assume that no beneficial or negative spillovers occur and that a sufficient number of local governments exist to approximate a competitive market. Furthermore, they assume that communities have full information about the wage benefits provided by the location of business firms in their communities and those firms can correctly evaluate the tax and expenditure packages offered by the various communities. An assumption implicit in their model is that economic development efforts by local governments are costless.

The major result of the Oates-Schwab model is that taxes on both households and business firms become beneficial taxes. In the case of business firms, communities
neither subsidize them to locate in their communities, nor tax them in excess of the costs of public services provided to them. Instead firms pay exactly the cost of the public services to them. In this benefit tax equilibrium, communities will have no incentive to further increase subsidies to businesses. If communities were to do so, the cost in terms of forgone tax revenues or higher public service costs would exceed any benefits in the form of increased jobs or income. Like the Tiebout model, the Oates-Schwab model is devoid of redistribution by local governments. No ability-to-pay taxes are levied only benefit taxes. Inter-jurisdiction competition may not be equitable in the Oates-Schwab world but it is productively and allocatively efficient.

McGuire (1991) has built an informal model of IJC, which she labels “destructive competition”, that has less happy consequences. She assumes that individuals have preferences for redistribution and thus choose revenue systems that rely on ability-to-pay taxes. McGuire further assumes that the nation’s population is heterogeneous in terms of income and mobility. An optimal level of public services and taxes can be computed, one that conceivably could be attained in the case of zero mobility of individuals or businesses. However, it will never be attained. Any single jurisdiction will have an incentive to cut tax for relatively wealthy and mobile individuals or businesses in order to lure them to relocate. The jurisdiction would hope to be able to use the revenue gained from the incoming wealthy to cut taxes for current residents or to increase public services. The problem is that all jurisdictions will have the same incentive to cut tax for the wealthy and mobile.

McGuire concludes that allocative efficiency cannot be achieved in the case of destructive competition. She argues that household mobility will ensure that productive efficiency will be attained, however, as jurisdictions seek to maximize their attractiveness by minimizing the burden of their taxes for a given level of public services. In McGuire’s model, both horizontal and vertical inequities result from IJC. Less mobile individuals will bear higher tax burdens than their more mobile counterparts. Vertical inequities will also result, as high-income taxpayers benefit from selective tax relief.

Wolkoff (1992) asks whether a formal model of economic development programs can explain the existence of some seemingly irrational public policies. In his
mind, jurisdictions use economic development subsidies to try to induce potentially mobile firms to stay in the community. Firms are of two types: those that are potentially mobile and those that are not. A central problem in Wolkoff’s model is that the jurisdiction cannot easily distinguish between these two types of firms. Both the firms and the jurisdictions engage in strategic behavior. The community decides on the size of the subsidy and the probability that it will give a subsidy to a firm requesting one. The firm decides on the size of subsidy it requests. Wolkoff assumes that the community chooses the size of subsidy and probability of granting a subsidy in order to maximize the expected value of its action.

Wolkoff’s model explains two types of seeming irrationalities in existing economic development programs. Suppose that all firms request the same subsidy, whether they are potentially mobile or not. The community then has no way of distinguishing between the two types of firms. It turns out that the most advantageous strategy for the community will be for it to offer modest subsidies to all firms. The inevitable result is that some firms with no potential for relocation will receive a subsidy. What seems like a waste of funds from the community’s perspective is rational maximizing behavior.

An alternative scenario outlined by Wolkoff is based on a community’s effort to separate potentially mobile from immobile firms. To do this, the community makes subsidy awards uncertain. Immobile firms then reduce the size of their subsidy requests. The community ends up avoiding providing large subsidies to firms that have no possibility of relocating. However, at the same time, the community rejects the requests of, and thereby loses, some mobile firms. When looked at in isolation, the fact of providing insufficient economic development subsidies to certain mobile firms appears irrational. Wolkoff’s point is that we cannot look at such phenomena in isolation.

For Besley and Case (1995), the exit optimum is of minimal important; it does not appear explicitly in their model, even though they acknowledge its existence. Instead, voice is key to the accountability of elected officials. Imperfect information is also crucial to the Besley-Case model. Politicians know more about the cost of providing public services than do voters, and voters use information about tax change in neighboring jurisdictions to evaluate the performance of their incumbents. Politicians
come in two types: good politicians who do no rent-seeking, and bad politicians do rent-seeking. Politicians use strategic behavior in their tax-setting in order to influence voters’ beliefs regarding whether they are good or bad politicians. Voters fail to reelect incumbents whom they judge by their tax changes, relative to the tax changes of neighboring jurisdictions, to be bad politicians.

The Besley-Case model is most likely applicable to interstate competition because the smaller numbers of states make the strategic behavior of state politicians more likely. Their model could apply also to suburbs in a metropolitan area if the number of competing suburbs were not too large. The Besley-Case model does not illuminate the implications of the phenomenon of IJC for economic development. Their decision to minimize the importance of interstate mobility may imply that they think state officials are oversensitive to exit threats from high-income taxpayers or businesses.

Breton (1996) formulates a general theory of competitive governments. His model of public finance and politics encompasses a wide range of competitive situations: competition for the support of the governed within governments, competition between governments and other social institutions, competition between governments at different levels (for example, between states and local governments), and the governmental competition that is the focus of this paper -- competition between governments at the same level, or IJC. He assumes that individuals seek to maximize utility and that governments seek to maximize expected consent.

In his treatment of IJC, he includes both implicit competition (Tiebout mechanism) and yardstick competition. Both are generally present in IJC, but in a pure Tiebout world, Breton correctly notes, yardstick competition could not exist. If the Tiebout model operated perfectly, the population would sort itself by preference for publicly provided goods until each community was homogenous and different from every other community. Then, individuals could not use the performance of neighboring governments to judge the performance of their own governments; governments would be too much different from each other in terms of their public service/tax packages.
III. Empirical Evidence

That a jurisdiction’s policy may be influenced by other jurisdiction’s policies has been recognized by several authors (Hettich and Winer, 1984; Salmon, 1987). Still, it has not empirically reached the status of general acceptance. The conventional approach to modeling taxing and spending decisions consist of explaining the level of composition of revenues and expenditures by economic, political, and sociological characteristics of the jurisdiction itself (for survey, see: Inman, 1988). However, a casual look at everyday politics suggests that voters and politicians are sensitive to events outside their geographical boundaries.

Three models have been offered in the local public finance literature to justify the existence of spatial interaction among local governments, and have been tested intensively on local government data in recent years. The first one is the traditional ‘spill-over’ or ‘externality’ model, according to which expenditure on local public services in a jurisdiction can have beneficial or harmful effects onto residents in nearby jurisdictions (Gordon, 1983). One such example is local expenditure on police services. Using US county data, Kelejian and Robinson (1993) found that police expenditures in a given county are significantly and positively influenced by neighboring county police expenditures. Since counties inflict a negative externality on their neighbors by spending more on police services due to cross-over between the borders, the need for police services in a given county tends to increase such as services in neighboring counties increase.

Second, spatial interaction among local jurisdictions in the form of tax competition arises when local governments fund public spending through a tax on mobile capital (Wildasin, 1986). Since the level of the tax base in a jurisdiction depends both on own and on other jurisdiction’ tax rates, strategic interaction results. Brueckner (1998) found evidence of policy interdependence in the adoption of growth control measures among California cities. By restricting the amount of developable land, a city government raised land rent both in its own and in nearby cities, thereby generating an externality and strategic interaction in growth control decisions. By using a panel data set of the US states, Figlio et al. (1999) found that decentralized welfare benefit setting
exacerbates interstate competition and might induce states to respond to changes in their neighbors’ policies asymmetrically.

Finally, a recent justification for the existence of interaction at the local level is the political agency - that is yardstick competition model. In such model, the imperfectly informed voters in a local jurisdiction use other governments’ performance as a yardstick to evaluate their own government (Salmon, 1987). Politicians are therefore sensitive to their local tax performance relative to similarly situated states. Then they try not to get too far out of line with policies in those jurisdictions (Oates, 1988). The result is local authorities mimicking each other’s behavior.

The extent to which geographic proximity or either similarity criteria matter, though, is also an empirical question that has attracted some interest by applied economists in recent years. Case et al. (1993) estimated a public expenditure equation using a panel data set of the US states’ budget over the period of 1970-85. While they can reject the hypothesis of expenditure spillovers among geographical neighbors, they found strong empirical evidence in support of the mimicry hypothesis: state expenditures are similar in terms of demographic composition.

Besley and Case (1995) presented a political agency model where voters and politicians are sensitive to events outside their boundaries and tested their yardstick competition hypothesis on US states’ income taxes from 1960 to 1988. They found that geographic neighbor’ tax changes have a positive and significant effect on a given state’s tax change. Heyndels and Vuchelen (1998) tested the tax-mimicking hypothesis at the level of Belgian municipalities and found strong positive spatial correlation in local income tax rates between neighboring authorities.

Bivand and Szymanski (1997; 2000) showed that there was spatial dependence in the cost of domestic garbage collection in the UK districts due to contracts based on the performance comparison and that spatial interaction were substantially reduced after the introduction of CCT (Compulsive Competitive Tendering), that imposed standard contracting rules and reduced the scope for local authorities to pursue idiosyncratic policies. Murillo (2003) tested for strategic interaction among US states in the determination of tax rates on capital income. He found that states have a positively
sloped reaction function to the tax policies of rival states when tax rates are chosen simultaneously.

To sum up, various studies above suggest that geographical proximity really matters to analyze fiscal interdependence among regions. In line with those studies, we will try to apply their approaches to look at the fiscal competition in the case of Indonesia. We hope that the use of them will provide a deeper explanation. Furthermore, it then stimulates other researchers to re-estimate using more sophisticated devices so that the figure of local government budget in Indonesia will be more accurate for policy makers to address the related problems.

### IV. Research Method

There are many indices to describe how great the inequality. One of them is Entropy Index that was developed by Theil in 1967. The most significant characteristic of the Entropy Index is that the index can distinguish between-region inequality and within-region inequality. In the context of regional (fiscal) disparity in Indonesia, it could be formulated as follows (Kuncoro, 2002: 89):

$$ETI(y) = \sum_{i=1}^{N} y_i \times \log \left[ \frac{y_i}{N} \right]$$

where $ETI(y)$ is the overall spatial disparity Entropy Index for per capita regional income (or fiscal variables), $y_i$ is the share of municipality income (fiscal) in province $i$ on the total per capita real income (fiscal) in Indonesia, and $N$ is the number of total municipality in Indonesia.

Furthermore, a standard empirical model of local public finance determination is usually expressed, in a linear specification, as:

$$Y = X\beta + \varepsilon$$

where $y$ is a vector of public finance variables of $N$ local governments, $X$ is a $(N \times K)$ matrix of explanatory variables, $\beta$ is vector of parameters to be estimate, and $\varepsilon$ is an error term that is assumed to be identically and independently distributed across the observations.

To formally test the presence of spatial autocorrelation due to spatial lag or error dependence, it’s necessary to perform several specification tests. The literature on spatial econometric testing is widely and has suggested several ways for identifying
these effects (see, for example: Anselin, 1988). The first specification test proposed is the Moran (1950) I’s test. The Moran’s I statistic for testing the null hypothesis that there are no spatial effects.

In general, spatial autocorrelation takes the form as follows:

\[ \varepsilon_{it} = \lambda W \varepsilon_{it} + \nu_{it} \]  

where \( \varepsilon_{it} \) is mean difference of a given variable, let say \( X_i \), from mean value in the corresponding group in the period \( t \). The component of \( \varepsilon_{it} \) could be also the residual generated from the regression model. The form of \( \lambda \) represents the coefficient of autocorrelation, \( W \) is a weight given to geographically nearer regions, and \( \nu \) is the new disturbance terms.

The statistical test of spatial autocorrelation could be done in the following steps. (see: Anselin, 1999). The first step is to construct a (NxN) matrix linking all regions based on the location. Second, put 0 (null) in the main diagonal of the matrix connecting the same region. Third, put 1 (one) in the matrix when the two regions have a border. Forth, each element in the matrix is then normalized so that sum of total is 1 (one). Fifth, the sum of the row is used as weight (W) in the Moran’s I statistics calculation:

\[
MI = \frac{\left[ \sum_i \sum_j W_{ij} (\varepsilon_{it})(\varepsilon_{jt}) \right]}{\left[ \sum_i \sum_j W_{ij} \right]} \frac{\left[ \sum_i (\varepsilon_{it})^2 / n \right]}{\left[ \sum_i (\varepsilon_{it})^2 / n \right]}
\]

where \( W \) is a row-standardized weights matrix, \( N \) is the number of observations, \( K \) is the number of independent variables, and \( M = I - X(X'X)^{-1}X' \).

Mathematically, Moran’s I statistics lies between -1 and 1 (-1 < MI < 1). As indicator, the value of the Moran’s I statistics closes to +1 shows that the stronger the spatial positive autocorrelation, in the sense that the observation values tend to close to each other in the corresponding location. On the contrary, the value of Moran’s I statistics closes to -1 indicates negative spatial autocorrelation, in the sense that the observation values do not tend to close to each other in the corresponding location. Meanwhile, the value of Moran’s I statistics closes to zero presenting that the observation values are randomly distributed (independent) among regions.
Theoretically, the mean value of the Moran’s I statistics is \( E_{(MI)} = -1/(n-1) \) and the standard deviation is \( SD_{(MI)} = (2/\sum_{i} \sum_{j} W_{ij})^{1/2} \). The test of significance Moran’s I statistics is done by comparing between the MI-calculated and \( E_{(MI)} \):

\[
\frac{[MI - E_{(MI)}]}{SD_{(MI)}} \quad (5)
\]

It will be normally distributed (distribution Z-statistics). The significance of Moran’s I statistics gives a signal that spatial effect plays an important role in the subsequent analysis.

V. Results and Discussion

Before presenting the results, a word about data is in order. Data on municipal real per capita gross domestic product without oil and gas in constant price of 1993 published by Central Bureau of Statistics are used to test the existence of polarization among Indonesian municipalities. Data of fiscal performance from the same sources are taken from Regional Financial Statistics. All of variables are transformed into real per capita term.

The sample covers the period of 1988-2003 including 80 percent of total municipalities. All samples period are divided into 2 sub-periods, that is 1988-2001 and 2001-2003 in order to provide a complete picture about the dynamics of relative income and fiscal distributions before and after fiscal decentralization. Separating period is also required by Chow test. Table 1 configures the complete definition of all economic variables, which will be used in this study.

Table 1

<table>
<thead>
<tr>
<th>Notation</th>
<th>Definition</th>
<th>Detailed Variables</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOR</td>
<td>Local Own Revenue</td>
<td>Local taxes and charges, local government owned enterprises profit, and other revenues</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>RS</td>
<td>Revenue sharing</td>
<td>Tax and non tax revenues sharing, including land and building taxes, personal income taxes, forest, fisheries, and oil and gas revenues.</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>----</td>
<td>-----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>TT</td>
<td>Total Transfer</td>
<td>RS + AF</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>TR</td>
<td>Total Revenue</td>
<td>LOR + RS + AF</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>OE</td>
<td>Operating Expenditures</td>
<td>Realization of operating expenditures</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>CE</td>
<td>Capital Expenditures</td>
<td>Realization of capital expenditures</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>TE</td>
<td>Total Expenditures</td>
<td>OE + CE</td>
<td>Real per capita (million rupiah)</td>
</tr>
<tr>
<td>Y</td>
<td>Regional Income</td>
<td>Regional GDP without oil and gas</td>
<td>Real per capita</td>
</tr>
</tbody>
</table>
Table 2 shows Theil Entropy index of the selected fiscal variables and per capita income during 16 years. In general, all of indices consistently increase. Looking merely at the magnitude, the Theil Entropy index of per capita regional income (Y) is the greatest. In contrast, the Theil Entropy indices for revenue sharing and LOR are the lowest. They represent that the RS and LOR are relatively distributed equally meanwhile the disparity of per capita regional income is unequally distributed.

Table 2

Theil Entropy Index of Local Government Budget and Regional Income, 1988-2003

<table>
<thead>
<tr>
<th>Year</th>
<th>RS</th>
<th>AF</th>
<th>TT</th>
<th>LOR</th>
<th>OE</th>
<th>CE</th>
<th>TE</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>1.8124</td>
<td>2.4720</td>
<td>2.5253</td>
<td>1.7970</td>
<td>2.4221</td>
<td>2.1300</td>
<td>2.5652</td>
<td>6.0402</td>
</tr>
<tr>
<td>1989</td>
<td>1.8920</td>
<td>2.5255</td>
<td>2.5818</td>
<td>1.8407</td>
<td>2.4575</td>
<td>2.1191</td>
<td>2.5930</td>
<td>6.0621</td>
</tr>
<tr>
<td>1990</td>
<td>2.0220</td>
<td>2.6138</td>
<td>2.6779</td>
<td>1.8776</td>
<td>2.4584</td>
<td>2.3005</td>
<td>2.6637</td>
<td>6.0722</td>
</tr>
<tr>
<td>1991</td>
<td>2.0542</td>
<td>2.6609</td>
<td>2.7273</td>
<td>1.9108</td>
<td>2.4744</td>
<td>2.4603</td>
<td>2.7483</td>
<td>6.0919</td>
</tr>
<tr>
<td>1992</td>
<td>2.1493</td>
<td>2.7432</td>
<td>2.8148</td>
<td>1.9436</td>
<td>2.5495</td>
<td>2.5894</td>
<td>2.8504</td>
<td>6.1146</td>
</tr>
<tr>
<td>1993</td>
<td>2.2288</td>
<td>2.7980</td>
<td>2.8752</td>
<td>1.9915</td>
<td>2.6355</td>
<td>2.5926</td>
<td>2.8985</td>
<td>6.1472</td>
</tr>
<tr>
<td>1994</td>
<td>2.2836</td>
<td>2.8102</td>
<td>2.9006</td>
<td>2.0643</td>
<td>2.6829</td>
<td>2.5969</td>
<td>2.9274</td>
<td>6.1872</td>
</tr>
<tr>
<td>1995</td>
<td>2.3056</td>
<td>2.8237</td>
<td>2.9204</td>
<td>2.1376</td>
<td>2.7122</td>
<td>2.6086</td>
<td>2.9519</td>
<td>6.2236</td>
</tr>
<tr>
<td>1996</td>
<td>2.3306</td>
<td>2.8500</td>
<td>2.9484</td>
<td>2.1768</td>
<td>2.7449</td>
<td>2.6327</td>
<td>2.9826</td>
<td>6.2539</td>
</tr>
<tr>
<td>1997</td>
<td>2.3835</td>
<td>2.9338</td>
<td>3.0258</td>
<td>2.1741</td>
<td>2.8274</td>
<td>2.6862</td>
<td>3.0542</td>
<td>6.3606</td>
</tr>
<tr>
<td>1998</td>
<td>2.2416</td>
<td>2.8401</td>
<td>2.9240</td>
<td>2.2092</td>
<td>2.7420</td>
<td>2.5415</td>
<td>2.9473</td>
<td>6.3137</td>
</tr>
<tr>
<td>1999</td>
<td>2.2861</td>
<td>2.9343</td>
<td>3.0082</td>
<td>2.2732</td>
<td>2.8213</td>
<td>2.6000</td>
<td>3.0155</td>
<td>6.3285</td>
</tr>
</tbody>
</table>

Source: CBS (recalculated)
Table 3 delivers the result of spatial correlation test for the selected variables. The Moran’s I statistics of all the variables are positive. The positive values of Moran’s I statistics imply that the spatial autocorrelation is getting stronger in the same direction that is the observation values tend to similar among regions in a particular area. When we compare the value of Moran’s I statistics for LOR is the lowest among the four variables, which are testing.

Looking at the significance, in general the calculated values of Moran’s I statistics, except for LOR, are greater than the Z-table normal distribution at 95 percent confidence level. They suggest that spatial correlation matters especially in total expenditures, intergovernmental transfers, and per capita regional income. Implicitly, they would be interpreted that local government expenditures in a particular region positively affects fiscal behavior in the geographically nearer areas. This founding is in line with the previous studies (Ladd, 1992; Heyndels and Vuchelen, 1998; Revelli, 2000; Sole, 2001).

<table>
<thead>
<tr>
<th>Year</th>
<th>LOR</th>
<th>Z-test</th>
<th>TT</th>
<th>Z-test</th>
<th>TE</th>
<th>Z-test</th>
<th>Y</th>
<th>Z-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988</td>
<td>0.0572</td>
<td>1.2672</td>
<td>0.3705</td>
<td>8.6669</td>
<td>0.3967</td>
<td>9.2850</td>
<td>0.2359</td>
<td>5.4888</td>
</tr>
<tr>
<td>1989</td>
<td>0.0434</td>
<td>0.9396</td>
<td>0.3955</td>
<td>9.2579</td>
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Note: critical value of Z-table for \( \alpha = 5 \) percent is 1.645  
critical value of F-table for \( \alpha = 5 \) percent is 4.54

The absence of spatial effect on LOR collection would be a manifestation of fiscal centralization, which had been previously implemented. The Z-value in the corresponding periods was less than Z-table value in 95 percent level of confidence. In those periods, objects, items, and tariffs in LOR had been arranged by central government and equally implemented for all local governments. After 2001, in accordance with fiscal decentralization era, the spatial effects would have been significant. They are confirmed by Chow test using 2001 as breaking year.

Those phenomena indicate that the surrounding areas influence realization of the LOR collection. It seems that realization of the LOR collection in a particular local government would be reference for another local governments to determine realization of the LOR collection in the next period. This, in the long run, would induce local tax competition among local governments and then stimulate the high cost economy (Saad, 2003).
When we analyze further, there was close relationship between unequal economic variables distribution and their spatial correlations. They could be observed in figure 1. It is notable that in general, first, the increase in LOR unequal distribution associates with the increase in LOR interdependence among regions. Second, the increase in total local government expenditures un-equality supported by transfers associate with the decrease in their interdependences among regions. This was strengthening especially after 1998. Third, the increase in regional income disparity correlates to its interdependence in the opposite direction. However, after regional autonomy era the correlation became in the same direction.

Those indicate that fiscal equalization in regional autonomy and fiscal decentralization era requires declining the degree of fiscal interdependence among municipalities. On the contrary, the regional income equalization using local government expenditures instrument induced by intergovernmental transfers requires increasing the degree of fiscal interdependence among municipalities.

Figure 1

Relationships between Entrophy Theil Index and Moran’s I Statistics
Local Own Revenue, Total Transfer, Total Expenditure, and Regional Income,
1988-2003

VI. Concluding Remarks
By using panel data on the Indonesian local government, this paper has explored the source of spatial auto-correlation in local public finance. The results of the analysis suggest that the fiscal competition among municipalities was greater compared to the pre fiscal decentralization period. It seems that the local tax setting and expenditures decisions in a particular municipality can be attributed to the mimicking behavior to neighbor regions. Furthermore, the spatial interaction is negatively correlated to the fiscal disparity.

Those imply that in the regional autonomy era the local governments tend to increase their local own revenue intensively and intergovernmental grants in order to finance their expenditures. In the long run, they could lead to the high cost economy, worsening fiscal dependency, and inefficiency of local government expenditures. Those findings above suggest that the distribution of intergovernmental transfers among regions should consider the local tax effort, and the services minimum standard plays an important role to achieve the expenditures efficiency.

Acknowledgement

The author would like to thank Sukanto Reksohadiprodjo, Budiono Sri Handoko, Samsubar Saleh, Mardiasmo, Mudrajad Kuncoro, Pratikno, Boediono, Gunadi, and Insukindro for valuable comments.

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