

FISCAL DECENTRALIZATION, GROWTH AND DISPARITY AMONG REGION IN INDONESIA

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ABSTRACT

One of the main reasons for decentralization in Indonesia was to provide every regions the same opportunity to develop themselves based on their needs. Ever since fiscal decentralization was implemented, the central government had conducted an intergovernmental transfer scheme to local governments, thereby transferring almost 30% of central government revenue to local governments. The purpose of this paper was to find evidence about the impact of fiscal decentralization in Indonesia and economic development indicators, namely growth and regional income disparity, during the period of observation, (1995–2008). The analysis was carried out using autonomy indicators, production indicators and expenditure per capita as fiscal decentralization measurement tools. A data panel approach was then implemented to find consistency in the effect of these indicators. The results showed that higher autonomy indicators which represent local government own source revenue were related to lower GDP per capita growth and higher regional income disparity after fiscal decentralization. Upgrading capacity and capability among bureaucrats at the local and central levels was recommended in order to achieve positive effects of decentralization. However, further research with comprehensive methods and fiscal decentralization measurement might still be needed to prove the precise effects of fiscal decentralization on economic development indicators in Indonesia.

Keywords: public finance, fiscal decentralization, growth, disparity

ABSTRAK

Salah satu alasan pelaksanaan desentralisasi di Indonesia adalah untuk memberikan kesempatan yang sama bagi semua daerah untuk membangun berdasarkan kebutuhan mereka. Sejak desentralisasi fiskal dilaksanakan, pemerintah pusat telah melakukan skema transfer antar pemerintah ke pemerintah daerah, sehingga total dana yang ditransfer hampir 30% dari pendapatan pemerintah pusat. Tujuan dari makalah ini adalah untuk menemukan bukti tentang dampak desentralisasi fiskal di Indonesia dan indikator pembangunan ekonomi, yaitu pertumbuhan dan disparitas pendapatan daerah, selama periode pengamatan, (1995-2008). Analisis dilakukan dengan menggunakan *indicator* otonomi, indikator produksi dan pengeluaran per kapita sebagai alat pengukuran desentralisasi fiskal. Sebuah pendekatan data panel kemudian dilakukan untuk menemukan konsistensi dalam dampak dari indikator-indikator tersebut. Hasil penelitian menunjukkan bahwa kenaikan indikator otonomi yang direpresentasikan oleh Pendapatan Asli Daerah (PAD) memiliki dampak terhadap penurunan pertumbuhan PDRB perkapita serta kenaikan tingkat disparitas pendapatan antar daerah setelah periode desentralisasi di Indonesia. Peningkatan kapasitas dan kemampuan di kalangan birokrat di tingkat daerah dan pusat harus terus dilakukan untuk mencapai efek positif dari desentralisasi. Namun demikian, penelitian lebih lanjut dengan menggunakan metode dan pengukuran desentralisasi fiskal yang lebih komprehensif masih diperlukan untuk membuktikan efek yang tepat dari desentralisasi fiskal pada indikator pembangunan ekonomi di Indonesia.

Kata Kunci: keuangan publik, desentralisasifiskal, pertumbuhan, disparitas

1. INTRODUCTION

1.1 Background

Decentralization in Indonesia could be the way for the nation to become stronger, because decentralization gives power to each local government to develop its region based on its needs. As Ohmae (2005) stated that "the geographical and economic unit of the global economy is the region" (p.82). Ohmae also emphasized that building a strong region is important for national growth.

Decentralization in Indonesia has been implemented since 2001. Until now, there have been many fundamental changes in integrating the new paradigm into the organization of the government, especially the changes regarding the effective implementation of fiscal decentralization, which is mandated in Law Number 33/2004 on fiscal balance between the central and local governments.

The fiscal decentralization era in Indonesia offered a great opportunity to local governments to develop their region based on their needs and their ability. This opportunity never arose during new order era when the central government was very dominant to local government. The centralistic approach diminished the local governments' creativity and initiative to develop their regions. Local governments were not given the discretion to set policies appropriate for their regions.

In theory, the transfer of fiscal authority from central to local government reduces the responsibility and operation of central government in managing fiscal policy. On the other hand, the proportion of the total expenditure of the local government increases significantly. This change, directly or indirectly, has an effect on management of fiscal policy in general.

If this fiscal decentralization is handled well, it has a positive impact on prosperity and public services. Conversely, if it is not managed well, fiscal decentralization causes macroeconomic instability, disparity among regions, and worsens public services.

However, Brodjonegoro (2004) mentioned that after three years of fiscal decentralization in Indonesia, the public was skeptical. One of the most critical problems was the fiscal imbalance among local governments (horizontally) and the fiscal imbalance between the central and local governments (vertically). In fact, there were some local areas with incredible sources of finance. On the other hand there were also many local areas that could not afford to finance their public and welfare services.

The impact of fiscal decentralization on economic development indicators such as growth and regional disparity has been widely investigated. Empirical evidence has not always confirmed the theoretical prediction that fiscal decentralization has a positive impact on the economy.

In terms of growth, in the case of China, Lin and Liu (2000) provided empirical evidence that decentralization is conducive to growth. Zhang and Zou (1998), however, have established the fact that the relationship between growth and decentralization was negative. Akai and Sakata (2002), in a panel study of US states, found that the ratios of local government revenue and expenditure to combined state and local government revenue and expenditure had a positive and statistically significant impact on state GDP. In the context of disparity, for Korea, Kim, Hong and Ha (2003) and Gil et al. (2002) for 15 OECD countries, established a positive impact (lower in disparity) of decentralization on regional income disparity. However, Bonet (2006) found

strong evidence supporting the thesis that the fiscal decentralization process increased regional income disparities.

The aim of this paper is to discuss the implementation of the fiscal decentralization policy in Indonesia. The increasing transfer of authority to the local governments in Indonesia aims to stimulate regional economic growth. Moreover, this growth should be able to reduce the disparity among regions in Indonesia.

This paper attempts to evaluate the impact of fiscal decentralization policy on Indonesia's economic development. Specifically, this paper will examine whether fiscal decentralization has had a positive or negative effect on growth and regional income inequality. The hypothesis tested for this paper is, "fiscal decentralization has no effect on growth and disparity among region in Indonesia". Perhaps this could make clear evidence about the effectiveness of fiscal decentralization policy in Indonesia.

1.2 Organization

This paper is organized as follows: Section 2 presents the literature review which describes decentralization in Indonesia and explores the relationship between fiscal decentralization and growth. Section 3 explains the data sources and methodology used in this paper. Section 4 summarizes the results and the final section presents conclusions and recommendations.

2. LITERATURE REVIEW

2.1 Fiscal Decentralization and Its Implementation in Indonesia

Bahl and Martinez (2006) stated that fiscal decentralization is only one of many aspects of decentralization. The scope of decentralization consists of political, administrative, and fiscal decentralization

between layers of government. Fiscal decentralization is a core aspect of decentralization.

According to Martinez-Vasquez and McLure (2000) fiscal decentralization is about assigning to the correct level of government the provision of public goods that best internalizes benefits and costs (expenditure side) and on assigning revenue sources mostly efficient among levels of governments (revenue side). If local governments want to achieve decentralized functions effectively, they must have an adequate level of revenues and have the authority to make decisions and manage expenditure.

Bahl (1999) stated that fiscal decentralization is a tool and a part of the economic development strategy for a country, thus it should be implemented as "comprehensive system". The first step in designing a system of fiscal decentralization is defining a clear assignment of functional responsibilities among different levels of government. The money follows the function. Therefore, after deciding what functional competencies are to be transferred from the central government to local governments, revenues are assigned to local governments and intergovernmental transfers are put into place.

There should be budgetary autonomy to carry out the assigned responsibilities at each level of government. Besides intergovernmental transfer, the capability of local governments to create their own sources of revenue also becomes an important issue to be addressed. Decentralization may be harmful to economic development when local governments are incapable of arranging the appropriate local tax because insufficient funds can hinder economic activities in their region.

Ideally, local governments must have

control of their own sources of revenue. Local governments that lack sources of revenue do not really benefit from fiscal autonomy because they may be under the financial control of the central government. If local governments can control their own source revenue, they have the authority and ability to explore other financial sources to provide services to the public. Moreover, local governments are not only able to earn revenue, but they also have the discretion to administer their budgets. Therefore their dependence on grants from the central government can be minimized, and as result, own source revenue is an important financial resource for local governments.

The Republic of Indonesia Law Number 33/2004 (2004) on fiscal balance between central and local governments follows Musgrave's trilogy of public functions (1959), namely, distribution, stabilization by the central government, and allocation.

The allocation function focuses on the basic needs of local areas which have to be fulfilled by the central government and local governments as well. The "money follows function" principle is implemented in fiscal decentralization in Indonesia. If authority is delegated to the local government, then the central government also has to prepare the financing.

The purpose of decentralization is to provide better public services and to create accountable and transparent public decision making. In practice, decentralization involves the delegation of some authority from the central government to local governments to make decisions about spending, local taxes, and elections. Moreover, the implementation of decentralization entails the transfer of a portion of the central government budget to local governments.

Historically, the transition from centralization to decentralization in

Indonesia has gone through difficult phases and created problems. In the beginning, centralization was very dominant in the government system in Indonesia. This is because at the time the central government believed that it was necessary for economic growth and stability and national unity. During the centralization era, there was a high economic growth and a political stability. However, from mid-1997 to 2000, the Indonesian economy faced a long and deep crisis due to global financial instability. This situation improved after Indonesia entered the decentralization era as indicated by recovering economic growth and improvement in fiscal management by the central and local governments to finance the public sector.

One of the main reasons why the decentralization process became necessary for integration of Indonesia was the long-standing high regional disparity. There was great disparity between the western eastern parts of Indonesia, or between Java and others islands. One possible reason for this inequality is the strong centralization and the resulting unbalanced central and local financing.

The decentralization era in Indonesia started with parliamentary approval of Law 22/1999 on local government and Law 25/1999 on intergovernmental fiscal relationship between central and local governments, which were subsequently changed by Law 32/2004 and Law 33/2004.

Law 33/2004 provided a fundamental change in the implementation of decentralization policy, from domination by the central government to autonomy for local governments for their budgets. Law 33/2004 also encouraged the idea of fiscal sustainability and more equitable inter governmental transfers.

The fiscal relationship between

central and local governments is reflected in the clear delegation of authority and responsibility sharing. The "money follows function" principle is implemented in fiscal decentralization in Indonesia, which means if authority is delegated to the local government then the central government also has to prepare the financing. Generally, the fiscal relationship between the central and local governments is also indicated in the planning and budgeting for all activities in all levels of government according to their authority and responsibility.

In the fiscal relationship between the central and local governments, the central government transfers money to the local governments in order to finance their activities. Most of Regions in Indonesia until now still depend on central government transfers. Since fiscal decentralization implemented, the central government transfer almost a third of public expenditure from national budget to local governments annually.

Transfers from central government to local government consist of:

1. *Bagi Hasil Pajak dan Bagi Hasil SDA (DBH)/Tax sharing and non-tax sharing*
2. *Dana Alokasi Umum (DAU)/Block Grants*
3. *Dana Alokasi Khusus (DAK) / Specific Grants.*

Tax sharing and Non-tax sharing (natural resources) are given by a formula that is stated in Law 33/2004. Regions which have abundant natural resources get a higher share from central government. However, the formula also adopts the balance for regions which do not have rich natural resources. The amount of tax sharing and non-tax sharing (natural resources) can

be seen in Table 1.

The central government also decides how to share a particular portion of revenues, most notably from oil and gas, on a derivation basis and introduced a general block transfer for the purpose of equalization. The general block grant (DAU) introduced a formula based equalization grant that considered both relative measures of expenditure needs and fiscal capacities (i.e., own and shared on a derivation basis) to distribute a fixed share of national revenues across all localities. The overall size of the DAU (vertical share between the central government & regions) is calculated as a share of net national revenues, currently 26 percent (net of shared revenues). Districts are allocated 90 percent of these funds. The remainder is distributed across provinces.

At the beginning, DAK was an emergency fund derived from the reforestation fund and until now, it has remained small. DAK is an earmark program for specific sector such as basic education, infrastructure, and health. It is decided based on general criteria specified by Ministry of Finance and specific criteria conducted by sectoral ministry. Therefore not all regions could obtain this DAK programs. Only regions that need attention in national development by considering their fiscal capacity are eligible for DAK, region which low fiscal capacity will attain DAK based on general criteria.

The trend of transfer by the central government to local governments increased significantly year by year after fiscal decentralization, as shown in Figure 1. Local governments can use this allocation fund to develop their region based on their needs, such as for the development of human resources or infrastructure. Figure 1, it can be seen that the highest transfer from central

Table 1. Tax Sharing and Non Tax Sharing (Natural Resources)
Formula between Central and Local Government Before and After Fiscal Decentralization

No.	Revenue Type	Before			After			Balance to Others Districts
		Central	Province	Districts	Central	Province	Districts	
1	Land Bilding Tax	10	16.2	64.8	-	16.2	64.8	19
2	Land Bilding Transfer	20	16	64	-	16	64	20
3	Foresty : IHPH	55	30	15	20	16	64	-
4	Foresty : PSDH	55	30	15	20	16	32	32
5	Mining : Land Rent	20	16	64	20	16	64	-
6	Mining : Royalties	20	16	64	20	16	32	32
7	Fisheries	100	-	-	20	-	-	80
8	Oil	100	-	-	85	3	6	6
9	Gas	100	-	-	70	6	12	12
10	Personal Income Tax	100	-	-	80	8	12	-

Note. From Republic Indonesia Law No. 33/2004

to local government is in the form of block grants.

Fiscal decentralization could increase the efficiency and accountability of the public sector in Indonesia. The increase in local government budgets could have a positive effect on the local economics. The increase in money supply in the region then could in turn increase consumption in the region. Local governments have very important role in stimulating regional economic growth through their policies.

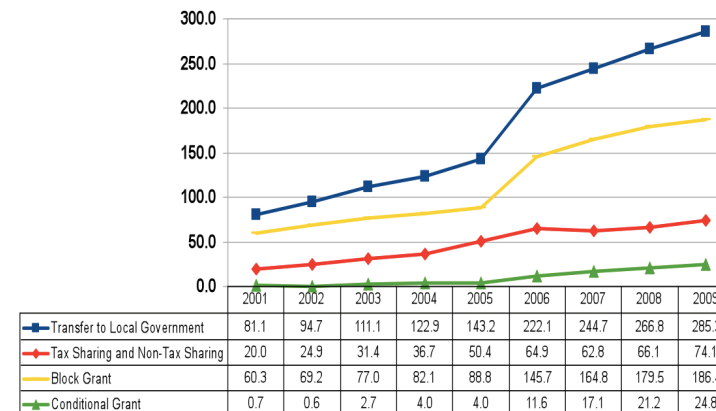
2.2 Fiscal Decentralization, Economic Growth, and Regional Income Disparity

The goal of fiscal decentralization is the achievement of economic efficiency; that is, the fulfillment of local output among regions based on their needs. Oates (1993) gives the example of the policy on the provision of public infrastructure. Since it should be appropriate for the local conditions, it is better for the policy to be decided

locally rather than centrally because it will be more effective in promoting economic development.

In theory, the delegation of authority to local governments could have a positive effect on their economies. There are at least two reasons to support that argument according Davoodi and Zou (1998). First, it brings the local government closer to the people. Local governments will respond to local demands faster because they are directly controlled by local people. Local governments know what their citizens need to build their regions because they have more information about their regions compared to the central government. Therefore they can provide better public services.

The others argument concerns "competition" among local governments. This competition increases the responsibility of local governments to their regions, thus they provide programs that correspond to local public preferences. Oates (1993) also supports this argument, stating that



Sources: Ministry of Finance

Figure 1. Transfer by Central Government to Local Government (Trillion Rp).

fiscal decentralization has the potential to increase government efficiency and economic stimulation.

On the other hand, Bahl and Linn (1992) stated that the functions of local sectors in developing countries are sometimes "manipulative and exploitative" instruments. In others word, the responsiveness of the local sectors only have higher effects at the higher stages of economic development. As a result, from the evolution of local public sectors, Oates (1993) suggests that attention be paid to the relationship between continuing growth and local finance.

Prud'homme (1995) also discusses the potential problems developing from fiscal decentralization. He states that the implementation of fiscal decentralization at the local government level will noise the macroeconomic stabilization created by the central government. Furthermore, he also points out that there the potential for corruption to occur at the local government level which probably provided better distribution rather than corruption happened in central government.

The other concern is about interdependence between local governments and the central government. This could occur depending on the natural resources and economic conditions in a local area. If there are abundant potential natural resources and productive economic activities, then it is possible for the local government to have higher own source revenues, thereby allowing the local government to control its budget. Thus, Oates (1993) emphasizes that it is important for local governments to have a significant own source revenue because from a political point of view, a central transfer dictated by the central to local government could occur. This would decrease local fiscal independence because the decision about local programs could result from negotiations between the central and local governments.

Fiscal decentralization also assumes the responsiveness of the local government to the welfare of its citizens. However, skeptics question whether the local governments do, in fact, respond to the needs of the public. This kind of question could be solved using

an indicator to measure whether local governments can perform effectively.

Oates (1993) mentions two arguments about the effectiveness of local governments. First, local governments should have adequate own source revenues or else intergovernmental transfer becomes a serious issue. The central government should conduct appropriate intergovernmental transfer for local governments. However, dependence on intergovernmental transfers could weaken the independence of local governments. Moreover, Oates (1993) emphasized that "heavy reliance on grants destroys the incentives for responsible local decisions" (p.241). Second, the types of local own source revenues should be followed "characteristics of good local tax". More importantly, these kinds of own source revenues should not hamper local economic activities.

In the context of regional income disparity, there is an argument that emphasizing fiscal decentralization could increase regional disparity, because the role of the central government to bridge disparity among regions is still needed. The central government could bridge this disparity through, first, allocating some resources which benefit backward regions, especially financial resources to build public infrastructure. Second, the central government should implement a proper distribution mechanism to reduce the disparity among regions. However, Akai and Sakata (2005) stated: "After combining the efficiency and equity effects, the total social welfare effect of fiscal decentralization is more ambiguous" (p.2).

Therefore, the capacity of local government is important in order to achieve a positive impact of fiscal decentralization on economic development indicators. Local governments should transform themselves

from administrative bodies to economic units. Balancing local budgets is no longer the sole objective of regional economic activity: local governments must become an instrument to reduce unemployment and stimulate economic growth.

3. METHODOLOGY

This paper applies data from Ministry of Finance for local government budget and from Statistics Indonesia (BPS) for data Gross Domestic Product for each region (province), education, unemployment and population. Data covers the period 1995-2008 at the provincial level, of which there were 26 before decentralization (1995-2000) and 30 after decentralization (2000-2008).

In order to find the effect of fiscal decentralization on growth and regional income disparity, a data panel analysis is applied. This is because the data structure consists of a cross section (regions) and a time series (series). The models that used are as follows:

- For growth

$$Growth = \beta_0 + \beta_1 FD + \beta_2 CV + \varepsilon$$

- For regional income disparity

$$Disparity = \beta_0 + \beta_1 FD + \beta_2 CV + \varepsilon$$

Where FD is fiscal decentralization measurement and CV is control variables. Growth is growth GDP per capita, while disparity is defined by

$$I_{i,t} = \left| \frac{PCGDP_{i,t}}{PCGDP_{NAT,t}} - 1 \right|$$

According to Qiao, Martinez-Vasquez, and Xu (2002) this disparity concept is based

on the concept of relative share between regional income and average national income. If value of disparity is zero, it means perfect equity where the regional per capita income is equal to average national per capita income.

The control variables for the growth model as stated in equation 1 are population growth, education (measured by secondary school net enrollment), and initial income, which is regional GDP per capita for the previous year. Akai and Sakata (2002) use these control variables for determined the contribution of fiscal decentralization to economic growth. On the other hand, the control variables for the disparity model in equation 2 are population, that is, the number population in region, education (secondary school net enrollment), unemployment rate, and regional GDP per capita as used by Bonet (2006).

Fiscal decentralization measurement

Fiscal decentralization is related to the delegation of authority to lower level government. Akai and Sakata (2002) argue that measuring fiscal decentralization is not easy because it is hard to measure the level of authority that is given to local governments. Akai and Sakata (2002) suggest four indicators to measure fiscal decentralization because there is no single fiscal decentralization measurement that can be appropriate to measure all levels of authority. The indicators are the revenue indicator focusing on revenue, the production indicator focus on expenditure, the autonomy indicator which measures local own source revenue and the production-revenue indicator (the average of the revenue indicator and the expenditure indicator).

Bonet (2006) uses indicator expenditure per capita as the measurement of fiscal

decentralization in Colombia. He argues that this indicator is applied because fiscal decentralization in Colombia is focused on expenditure, not on revenue.

This paper will use the autonomy indicator, the production indicator and expenditure per capita. The autonomy indicator is employed because it reflects the degree of authority of local government since own source revenue is created and collected by the local government itself. On the other hand, the production indicator (expenditure) and expenditure per capita are used because fiscal decentralization in Indonesia seems to focus only on the expenditure side. Most of the local government revenue comes from transfers by the central government but the central government gives authority to local governments to spend this revenue base own their needs.

Provincial governments are treated as representatives of the central government. Thus, the formula for each variable is as follows:

- Production Indicator (PI):

$$PI_i^j = \frac{\sum_t Expenditure_{it}}{\sum_t Expenditure_{it} + Expenditure_i^j}$$

- Expenditure per capita (Exp_Percap):

$$Exp_Percap_i^j = \frac{\sum_t Expenditure_{it}}{Population_j}$$

- Autonomy Indicator (AI):

$$AI_i^j = \frac{\sum_t OwnSources\ Revenue_{it}}{\sum_t OwnSources\ Revenue_{it} + OwnSources\ Revenue_i^j}$$

4. RESULTS AND DISCUSSION

Pool OLS, fixed effects and random effects are performed to determine the effect of fiscal decentralization on growth and

regional income disparity. These approaches are used in order to find the consistency of the effect fiscal decentralization measurement on the models.

The regression analysis was separated into three parts: regression for all years (1995–2008), regression for the years before decentralization (1995–2000), and regression the years for after decentralization (2001–2008). By doing this, it is possible to analyze and compare the effects of fiscal decentralization before and after decentralization. Since the data cover the period where Indonesia was in a severe crisis that from 1998–2000, a dummy crisis is included in the models. The dummy crisis value is 1 for year 1998–2000 and 0 for the

between independent variables on the models. A high correlation is associated with multicollinearity. Multicollinearity could affect the assumption of the best linear estimator in regression model. From Table 2, it can be seen that there is no high correlation among independent variables. This indicates that there is no multicollinearity in the models used in the analysis.

Table 1 in the appendix section shows the minimum, maximum, mean and standard variation of all variables used in the analysis. The results of the various regression models can be seen in table in the appendix section.

4.1 Fiscal Decentralization and Growth

To investigate the relationship between

Table 2. Correlation among Independent Variables

	AI	PI	EXP_PERCAP	EDUCATION	INT_INCOME	POP_GROWTH	POPULATION	UNEMPLOYMENT	GDP_PERCAP
AI	1.00								
PI	0.09	1.00							
EXP_PERCAP	0.09	0.21	1.00						
EDUCATION	-0.04	0.24	0.23	1.00					
INT_INCOME	-0.18	-0.11	0.36	0.17	1.00				
POP_GROWTH	-0.06	-0.20	0.15	-0.20	0.43	1.00			
POPULATION	-0.07	-0.07	-0.22	0.12	-0.06	-0.24	1.00		
UNEMPLOYMENT	-0.12	0.26	0.22	0.32	0.21	0.04	0.15	1.00	
GDP_PERCAP	-0.19	-0.11	0.36	0.17	1.00	0.41	-0.06	0.22	1.00

other years. Therefore, this dummy crisis is used in the regression model for all years and pre-decentralization regression models, but not in the post-decentralization regression models.

Table 2 presents the correlation matrix for the independent variables. Before doing the regression, it is necessary to check whether there is multicollinearity between independent variables. According Wooldridge (2006) multicollinearity can be identified by determining the correlation

fiscal decentralization measurement and economic growth, a multiple-regression analysis is performed between growth as a dependent variable, variables of interest that are (fiscal decentralization measurements: AI, PI, Exp_percap), and control variables that are education, population growth, and initial income). Tables 2 to 4 in the appendix section display the results for growth models.

The dummy crisis in the model for all years is significant and the sign is negative.

While for the pre-decentralization model, it is not steady the same, only for OLS and random effects have significant negative value, however for fixed effects, the value is not significant.

The negative sign of the dummy crisis indicates that there was lower growth during the period of crisis (1998 – 2000) compared to the periods of no crisis. After adding the dummy crisis into the models, the R2 are higher compared to the models in which the dummy crisis was excluded. R2 for OLS models is 0.201, for fixed effects it is 0.504 and for random effects it is 0.201.

Of the three control variables (population growth, education and initial income) added in the models, only education is not consistent in significance and sign. In post-decentralization models, the education variable is not significant, but in the model for all years including the dummy crisis, using OLS and random effects, it has significant value. It should be pointed out that the secondary school net enrollment rate as an education variable is not a good proxy to estimate the effect of human capital variables in the regression for growth model.

Most variables, including variables of interest and control variables, are not significant in the pre-decentralization models. Table 4 in the appendix displays the regression results for the pre-decentralization models. Thus, from these tables, it is hard to get evidence about the interaction between independent variables and growth as dependent variables due to inconsistency.

Population growth shows a significant effect in the model for all years and the post-decentralization models. The sign of this variable is also consistently negative, which means that it has a negative effect on growth. This finding is similar to the results of Davoodi and Zou (1998) and Akai

and Sakata (2002). The negative effect of population growth implies that population might be a burden on the economy because the increasing population also increases the number of people involved in the economy. Therefore it lowers income per capita if the economy is not robust enough to fulfill the needs of the increasing population.

Initial income as a control variable also has a significant value in the model for all years and post-decentralization models. The sign of this variable is consistently negative, denoting that regions with lower per capita income have higher economic growth compared to the regions which have a higher per capita income. For example, in South Sulawesi and South Sumatera, during period of observation, South Sulawesi had a lower average initial income per capita (about 4 million rupiah) compared to South Sumatera , but it had higher average growth (4.16%) compare to South Sumatera which had only 2.66%.

The results based on three different types of indicators for fiscal decentralization show that for the model for all years, only variable AI has consistency in significance and value. Variable PI has consistent sign, although it is not significant in OLS and the random effects model including the dummy crisis. Without the dummy crisis, exp_percap is not significant. However when the dummy crisis is included in the model, it has significant negative value.

On the other hand, for the post-decentralization model, all fiscal decentralization measurements have the same sign using all regression methods. Only Exp_percap with random effects is not significant. However, it is difficult to find evidence of the relationship between fiscal decentralization measurements and economic growth during pre-decentralization periods because the three

methods (OLS, fixed effects and random effects) provide inconsistent signs of AI, PI and exp_percap.

The effect of the autonomy indicator (AI) on growth in all year and in the period after decentralization is the same. During both periods of observation, the Autonomy Indicator (AI) shows a negative and significant relationship with growth at a 95% confidence level. This result provides different evidence from that of Akai and Sakata (2002), who found the AI indicator has an insignificant effect on fiscal decentralization using panel data for US states.

The negative AI implies that own source revenue as a proxy of autonomy level of the local government, undermines economic activities in the region. Local governments cannot use their authority to manage their own source revenue effectively.

According to Law 33/2004, local governments are allowed to create their own source revenue using local government regulations and the central government can monitor by reviewing these regulations. Law 33/2004 has emphasized that local government regulation should not hinder regional economic activity. It should not cause high cost economics and impede the mobility of goods among regions. However, the local government has not been able to create good regulations to generate their own source revenue, and the central government has not conducted the monitoring and evaluating of these regulations properly.

The effect of the production indicator (PI) on growth is consistently positive at a 95% level of confidence in the post-decentralization model. This could be because after decentralization, more than 30% of the central government budget was transferred to local governments in form of intergovernmental transfers such as block

grants and revenue sharing. There are many regions that are highly dependent on local government spending for their growth. Thus the more they spend the more regional GDP per capita growth increases. However if expenditure is in the form of expenditure per capita (exp_percap), it provides difference evidence. When exp_percap is significant, the value is consistently negative, which means that exp_percap has a negative impact on growth.

4.2 Fiscal Decentralization and Regional Income Disparity

The control variables used in the regression for regional income disparity are population, education, unemployment, and GDP per capita. The regression results for the disparity models are displayed in Tables 5 to 7 on the appendix.

Most of variables, including variables of interest, are not significant in the pre-decentralization model. Regression results for pre-decentralization model are provided in Table 7 in the appendix. As with the growth model, there is no obvious evidence of fiscal decentralization and regional income disparity in the pre-decentralization model.

The dummy crisis in the model for all years using OLS is not significant. However, when fixed effects and random effects are employed, the dummy crisis is significant but the sign is different for each variable of interest. For AI and PI, the sign is positive, meaning that during the period of crisis, disparity among regions was higher compared to the period of no crisis. Conversely, exp_percap is significant at a 10% level of confidence and the sign is negative, which means that disparity was lower during the period of crisis.

Population as control variable is consistently significant and the magnitude

is also consistently negative. This indicates that disparity decreases when accompanied by a higher population. On the other hand, GDP per capita is also consistently significant, but the sign is positive. The positive sign suggests that GDP per capita is associated with increasing disparity. Regions with higher GDP per capita experience high disparity.

Meanwhile, not all education variables in the regression models are significant. Education variables are significant for the model for all years and the post-decentralization model when they are employed for AI and PI, but for exp_percap, education variables are not consistently significant. When education is significant, the value is consistently negative. As a result, disparity decreases when regions have higher levels of education. Nonetheless, most of unemployment variables in the regression models are not significant. If this variable is significant, the value is not consistent in sign.

The variable of interest PI is not significant for all regression models. It means that the null hypothesis saying that a coefficient of PI variable equal to zero in regression model cannot be rejected. Therefore, evidence of the relationship between fiscal decentralization and disparity using PI variable cannot be explained more.

On the other hand, exp_percap is consistently negative for the regression model for all years. In the post-decentralization model, exp_percap is not significant using OLS method, but with fixed and random effects, it is significantly negative. With this result, it can be concluded that exp_percap reduces regional income during all observation periods including the post-decentralization periods.

The AI variable is consistently significant in the model for all years and the post-decentralization model. However, the

magnitude is different. In the model for all years, the AI is significantly negative while it is positive in the post-decentralization model. Thus, during period of observation, there is evidence that regional income disparity is decreasing over time. However after decentralization was implemented, using the AI as a fiscal decentralization measurement, the regional income disparity became higher. This demonstrates that fiscal decentralization in Indonesia, at least as indicated by the AI variable, has not been conducive to a reduction in regional income disparity.

5. CONCLUSION AND RECOMMENDATIONS

Since Indonesia began to implement fiscal decentralization in 2001, the relationship between the central government and local governments has become dynamic. At a technical level, the government has tried to review many fiscal decentralization regulations including those related to local taxes and retribution, and local financial management. All of this happened because at the beginning of fiscal decentralization in Indonesia, there were weaknesses in its regulation. Recently, the central government and all stakeholders have begun a process of evaluation of fiscal decentralization in order to make it more effective.

However, this paper shows the evidence that fiscal decentralization has not been effective in stimulating regional economic activity during the period of observation. Since fiscal decentralization was implemented, one measure of fiscal decentralization measurement, the Autonomy Indicator (AI), has had a negative impact on growth and regional income disparity. On the other hand, when fiscal decentralization is measured by expenditure side indicators, the impact was not so obvious.

There are at least three reasons for this. First, local governments have failed to create appropriate local tax bases as own source revenue instruments. This could be the result of a lack of capability and competency of the local executive and legislative branches of government. Second, with significant increases in local revenue, local government expenditure increases as well. However, local governments have not been able to manage this expenditure effectively. It is possible that spending occurs in the non-productive sector, or they do not have the development planning needed to run this expenditure. Third, the central government has not done appropriate monitoring and evaluation of local governments regarding the implementation of local government regulation of taxes.

In addition, there are some implications that should be considered based on the result of this paper. First, it is important to upgrade the competency, ability and knowledge of the bureaucracy at central and local government levels in order to achieve the same vision about decentralization, not only at the level of regulation but also at the level of implementation.

With regard to local expenditure, ministries at the central level should impose the standardization of output to be achieved by local governments, thereby encouraging more efficient local government expenditure and regional economic stimulation. Finally, there are also limitations to the regression models used in this paper, especially as related to observation periods, reliability and validity. Thus further research is still needed to prove the relationship between fiscal decentralization, economic growth, and regional income disparity using comprehensive models and fiscal decentralization measurement.

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APPENDIX

Table 1: Descriptive Statistics of Variables

	Minimum	Maximum	Mean	Std. Deviation
GROWTH	-35.12	21.37	2.56	5.45
DISPARITY	0.00	4.24	0.49	0.70
AI	0.14	0.90	0.42	0.11
PI	0.37	0.89	0.74	0.10
EXP_PERCAP (million)	0.06	8.04	0.93	1.11
EDUCATION	28.35	82.69	59.20	9.79
INT_INCOME (million)	1.70	34.08	6.64	5.97
POP_GROWTH	-0.71	4.35	1.66	0.88
POPULATION ('000)	834.01	43,176.56	7,314.60	10,243.57
UNEMPLOYMENT	1.44	18.91	7.15	3.25
GDP_PERCAP (million)	1.82	34.08	6.76	5.97

Table 2: Growth Regression Model for All Years

C	OLS			FIXED EFFECT			RANDOM EFFECT			OLS			FIXED EFFECT			RANDOM EFFECT		
	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT
POP_GROWTH	-0.617 (0.357)**	-0.822 (0.330)*	-0.808 (0.379)*	-0.767 (0.376)*	-0.669 (0.352)**	-0.887 (0.333)*	-0.563 (0.339)**	-0.825 (0.335)*	-0.561 (0.338)**	-0.593 (0.303)*	-0.563 (0.339)**	-0.860 (0.331)*	-0.634 (0.362)**	-0.803 (0.328)*	-1.009 (0.368)**	-0.992 (0.381)*	-0.643 (0.352)**	-0.858 (0.328)*
EDUCATION	-0.032 (0.030)	-0.079 (0.027)*	0.022 (0.053)	0.007 (0.049)	-0.031 (0.300)*	-0.087 (0.298)*	-0.045 (0.053)**	-0.062 (0.298)*	0.026 (0.053)	0.007 (0.051)	-0.045 (0.051)	-0.085 (0.051)	-0.032 (0.055)**	-0.068 (0.293)*	0.088 (0.289)*	0.073 (0.054)**	-0.032 (0.054)**	-0.070 (0.054)**
INT_INCOME	-0.129 (0.053)*	-0.093 (0.049)	-1.853 (0.300)*	-1.882 (0.298)*	-0.136 (0.055)**	-0.103 (0.054)**	-0.094 (0.053)**	-0.071 (0.049)	-1.627 (0.298)*	-1.693 (0.295)*	-0.094 (0.051)	-0.075 (0.051)	-0.105 (0.055)**	-0.019 (0.051)	-1.564 (0.293)*	-1.627 (0.289)*	-0.106 (0.054)**	-0.022 (0.053)**
AI	-7.325 (2.467)*	-5.612 (2.285)*	-11.766 (2.915)*	-10.874 (2.429)*	-7.773 (2.307)*	-9.554 (2.307)*												
PI							5.328 (2.821)**	0.880 (2.662)	6.672 (3.109)*	7.479 (3.076)*	5.328 (2.729)*	0.529 (2.588)						
EXP_PERCAP													0.003 (0.027)	-0.088 (0.026)*	-0.126 (0.033)*	-0.137 (0.032)*	0.003 (0.026)	-0.087 (0.026)*
DUMMYCRISIS	-4.799 (0.586)*	-3.768 (1.424)*	-4.816 (0.557)*				-4.890 (0.601)*	-4.665 (1.435)*	-4.925 (0.575)*				-5.708 (0.625)*	-4.939 (1.413)*	-5.699 (0.603)*			
Number Observation	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382
Number of Region	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
R-squared	0.058	0.201	0.493	0.504	0.058	0.201	0.045	0.188	0.476	0.492	0.045	0.188	0.036	0.211	0.491	0.509	0.036	0.210

Note: Values in parentheses are standard error of coefficient. (*) means significant at level 5% and (**) means significant at 10%.

APPENDIX

Table 3: Growth Regression for Post-decentralization Model

C	OLS			FIXED			RANDOM			OLS			FIXED			RANDOM		
	OLS	FIXED	RANDOM	OLS	FIXED	RANDOM	OLS	FIXED	RANDOM	OLS	FIXED	RANDOM	OLS	FIXED	RANDOM	OLS	FIXED	RANDOM
POP_GROWTH	-1.346 (0.334)*	-1.684 (0.412)*	-1.646 (0.359)*	-1.209 (0.338)*	-1.675 (0.413)**	-1.532 (0.356)**	-1.493 (0.332)*	-1.697 (0.416)*	-1.653 (0.349)*									
EDUCATION	-0.040	-0.021	-0.046	-0.044	0.025	-0.033	-0.025	-0.004	-0.020									
INT_INCOME	-0.105 (0.048)*	-1.974 (0.376)*	-0.120 (0.071)**	-0.094 (0.048)**	-2.209 (0.382)*	-0.098 (0.058)**	-0.043 (0.024)**	-2.188 (0.384)*	-0.071 (0.067)									
AI	-6.670 (2.366)*	-11.217 (4.313)*	-8.406 (2.924)*															
PI				14.151 (4.167)*	19.191 (8.574)*	11.723 (4.895)*												
EXP_PERCAP							-0.044 (0.024)**	-0.090 (0.049)**	-0.024 (0.026)									
Number Observation	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
Number of Region	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
R-squared	0.177	0.480	0.169	0.189	0.475	0.184	0.160	0.471	0.156									

Note: Values in parentheses are standard error of coefficient. (*) means significant at level 5% and (**) means significant at 10%.

Table 4: Growth Regression for Pre-decentralization Model

C	OLS			FIXED EFFECT			RANDOM EFFECT			OLS			FIXED EFFECT			RANDOM EFFECT		
	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT	OLS	FIXED EFFECT	RANDOM EFFECT
POP_GROWTH	0.082 (0.073)**	0.386 (0.065)	0.499 (0.176)*	0.430 (0.182)*	0.637 (0.072)	0.672 (0.074)	-0.001 (0.070)*	0.474 (0.065)	0.462 (0.177)*	0.386 (0.183)*	0.227 (0.080)	0.640 (0.076)	0.085 (0.070)**	0.402 (0.064)	-0.316 (0.185)**	-0.274 (0.187)**	-0.229 (0.087)**	0.474 (0.081)
EDUCATION	-0.126 (0.073)**	-0.024 (0.065)	0.398 (0.176)*	0.394 (0.182)*	-0.039 (0.072)	0.009 (0.074)	-0.144 (0.070)*	0.007 (0.065)	0.401 (0.177)*	0.397 (0.183)*	-0.109 (0.080)	0.037 (0.076)	-0.137 (0.070)**	0.002 (0.064)	0.361 (0.185)**	0.365 (0.187)**	-0.175 (0.087)**	0.050 (0.081)
INT_INCOME	-0.089 (0.113)	-0.085 (0.098)	-1.864 (0.952)**	-1.843 (0.982)**	-0.123 (0.112)	-0.129 (0.114)	-0.086 (0.108)	-0.096 (0.093)	-1.808 (0.982)**	-1.786 (0.989)**	-0.114 (0.125)	-0.127 (0.113)	-0.059 (0.111)	-0.142 (0.096)	-1.836 (0.917)*	-1.875 (0.945)**	-0.057 (0.147)	-0.174 (0.126)
AI	-1.915 (5.700)	3.131 (4.984)	-0.308 (6.031)	-0.268 (6.071)	0.459 (5.107)	1.808 (5.113)												
PI							-5.330 (5.020)	6.010 (4.626)	0.915 (6.042)	0.934 (6.070)	-3.548 (5.154)	5.426 (4.896)						
EXP_PERCAP													-0.253 (0.375)	0.502 (0.339)	-0.410 (0.642)	-0.463 (0.708)	-0.363 (0.397)	0.484 (0.357)
DUMMYCRISIS	-7.715 (1.094)*		0.329 (3.522)		-6.927 (1.377)*		-8.134 (1.149)*		0.356 (3.515)		-7.782 (1.294)*		-8.135 (1.132)*		-0.698 (3.849)		-8.352 (1.125)*	
Number Observation	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Number of Region	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
R-squared	0.041	0.287	0.690	0.690	0.027	0.168	0.048	0.293	0.690	0.690	0.045	0.225	0.043	0.296	0.691	0.691	0.040	0.308

Note: Values in parentheses are standard error of coefficient. (*) means significant at level 5% and (**) means significant at 10%.

APPENDIX

Table 5: Disparity Regression Model for All Years

	OLS			FIXED EFFECT			RANDOM EFFECT			OLS			FIXED EFFECT			RANDOM EFFECT		
C	0.223 (0.120)**	0.206 (0.144)**	1.062 (0.100)*	1.014 (0.102)*	0.781 (0.110)*	0.740 (0.112)*	0.409 (0.168)*	0.370 (0.174)*	0.983 (0.095)*	0.931 (0.097)*	0.721 (0.108)*	0.673 (0.109)*	0.326 (0.116)*	0.343 (0.122)*	0.577 (0.084)*	0.590 (0.085)*	0.363 (0.101)*	0.380 (0.102)*
POPULATION	-7.68E-06 (0.000001)	-7.79E-06 (0.000011)	-6.87E-05 (0.000011)	-5.84E-05 (0.000006)	-2.63E-05 (0.000006)	-2.70E-05 (0.000006)	-8.02E-06 (0.000001)	-8.14E-06 (0.000001)	-7.07E-05 (0.000012)	-7.08E-05 (0.000012)	-2.65E-05 (0.000006)	-2.72E-05 (0.000006)	-9.46E-06 (0.000001)	-8.44E-06 (0.000001)	-6.57E-05 (0.000009)	-6.55E-05 (0.000009)	-3.14E-05 (0.000005)	-3.17E-05 (0.000005)
EDUCATION	-0.008 (0.002)*	-0.008 (0.002)*	-0.007 (0.001)*	-0.006 (0.001)*	-0.008 (0.001)*	-0.007 (0.001)*	-0.007 (0.002)*	-0.007 (0.002)*	-0.007 (0.001)*	-0.007 (0.001)*	-0.007 (0.001)*	-0.007 (0.001)*	-0.007 (0.002)*	-0.007 (0.002)*	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.001)**	-0.001 (0.001)**
UNEMPLOYMENT	-0.002 (0.006)	0.000 (0.007)	-0.004 (0.003)	0.000 (0.004)	-0.004 (0.003)	0.001 (0.004)	-0.002 (0.007)	0.000 (0.007)	-0.003 (0.003)	0.001 (0.004)	-0.002 (0.003)	0.002 (0.004)	0.000 (0.006)	-0.001 (0.007)	0.001 (0.003)	-0.001 (0.003)	0.001 (0.003)	0.003 (0.003)
GDP_PERCAP	0.099 (0.003)*	0.099 (0.003)*	0.064 (0.008)*	0.064 (0.008)*	0.068 (0.006)*	0.068 (0.006)*	0.098 (0.003)*	0.098 (0.003)*	0.069 (0.008)*	0.070 (0.008)*	0.072 (0.006)*	0.072 (0.006)*	0.101 (0.003)*	0.102 (0.003)*	0.077 (0.006)*	0.077 (0.006)*	0.078 (0.005)*	0.078 (0.006)*
AI	-0.316 (0.173)*	-0.311 (0.173)*	-0.165 (0.075)*	-0.184 (0.074)*	-0.160 (0.073)*	-0.181 (0.073)*												
PI							-0.059 (0.203)	-0.048 (0.204)	-0.025 (0.075)	-0.022 (0.075)	-0.078 (0.074)	-0.073 (0.074)						
EXP_PERCAP													-0.006 (0.001)*	-0.006 (0.002)*	-0.008 (0.001)*	-0.008 (0.001)*	-0.008 (0.001)*	-0.009 (0.001)*
DUMMYCRISIS		0.024 (0.049)	0.041 (0.017)*	0.043 (0.017)*			0.029 (0.050)	0.036 (0.017)*	0.037 (0.017)*				-0.024 (0.052)	-0.027 (0.015)**	-0.027 (0.015)**	-0.027 (0.015)**		
Number Observation	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382	382
Number of Region	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
R-squared	0.720	0.721	0.974	0.974	0.317	0.326	0.718	0.718	0.974	0.974	0.310	0.317	0.724	0.725	0.982	0.982	0.499	0.500

Note: Values in parentheses are standard error of coefficient. (*) means significant at level 5% and (**) means significant at 10%.

Table 6: Disparity Regression for Post-decentralization Model

	OLS			FIXED			RANDOM			OLS			FIXED			RANDOM		
C	-0.321 (0.189)*	0.697 (0.175)*	0.377 (0.161)*	0.434 (0.228)*	0.879 (0.233)*	0.717 (0.234)*	0.324 (0.185)*	0.622 (0.124)*	0.421 (0.121)*									
POPULATION	-6.04E-06 (0.0000025)	-5.48E-05 (0.0000073)	-1.51E-05 (0.0000073)	-7.55E-06 (0.0000025)	-5.79E-05 (0.0000203)	-1.60E-05 (0.0000077)	-8.71E-06 (0.0000026)	-4.63E-05 (0.0000165)	-1.76E-05 (0.0000068)									
EDUCATION	-0.003 (0.002)*	-0.003 (0.002)**	-0.004 (0.002)*	-0.006 (0.003)*	-0.004 (0.001)*	-0.005 (0.0015)*	-0.006 (0.0029)*	-0.001 (0.001)	-0.002 (0.001)									
UNEMPLOYMENT	0.005 (0.008)	-0.007 (0.004)	-0.006 (0.004)	0.003 (0.008)	-0.008 (0.0043)**	-0.008 (0.0042)**	0.001 (0.008)	-0.010 (0.0035)*	-0.009 (0.0034)*									
GDP_PERCAP	0.087 (0.0043)*	0.047 (0.0108)*	0.058 (0.0084)*	0.087 (0.0044)*	0.047 (0.0112)*	0.058 (0.0087)*	0.091 (0.0053)*	0.064 (0.0091)*	0.071 (0.0074)*									
AI	0.936 (0.231)*	0.205 (0.113)**	0.247 (0.113)*															
PI				-0.232 (0.414)	-0.012 (0.245)	-0.175 (0.238)												
EXP_PERCAP							-0.003 (0.003)	-0.007 (0.000754)*	-0.008 (0.000757)*									
Number Observation	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232	232
Number of Region	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
R-squared	0.669	0.978	0.230	0.645	0.978	0.209	0.647	0.985	0.443									

Note: Values in parentheses are standard error of coefficient. (*) means significant at level 5% and (**) means significant at 10%.

APPENDIX

Table 7: Disparity Regression for Pre-decentralization Model

	OLS			FIXED EFFECT			RANDOM EFFECT			OLS			FIXED EFFECT			RANDOM EFFECT		
C	0.419 (0.190)**	0.420 (0.190)**	0.236 (0.100)**	0.118 (0.102)**	0.052 (0.095)**	-0.103 (0.097)**	0.219 (0.084)**	0.152 (0.085)**	0.228 (0.085)**	0.067 (0.085)**	0.034 (0.101)**	-0.146 (0.102)**	0.457 (0.184)**	0.457 (0.185)**	0.239 (0.150)**	0.097 (0.152)**	0.037 (0.147)**	-0.111 (0.159)**
POPULATION	-7.73E-06 (0.0000028)	-7.66E-06 (0.0000028)	-2.32E-05 (0.0000109)	-2.26E-05 (0.000011)	-2E-05 (0.0000059)	-1.59E-05 (0.0000059)	-7.05E-06 (0.0000029)	-6.56E-06 (0.0000029)	-2.54E-05 (0.000011)	-2.49E-05 (0.000011)	-2E-05 (0.000006)	-1.60E-05 (0.000006)	-8.05E-06 (0.000002)	-8.09E-06 (0.000002)	-2.51E-05 (0.000010)	-2.37E-05 (0.000010)	-2E-05 (0.000005)	-1.53E-05 (0.000005)
EDUCATION	-0.007 (0.0034)*	-0.007 (0.004)	0.001 (0.002)	0.003 (0.003)	0.001 (0.002)	0.003 (0.002)	-0.008 (0.003)*	-0.007 (0.003)*	0.000 (0.002)	0.002 (0.002)	-0.001 (0.002)	0.002 (0.002)	-0.008 (0.003)*	-0.008 (0.003)*	0.000 (0.002)	0.002 (0.002)	-0.001 (0.002)	0.002 (0.002)
UNEMPLOYMENT	-0.022 (0.016)	-0.025 (0.017)	0.020 (0.0051)*	0.019 (0.0051)*	0.012 (0.0064)**	0.020 (0.0050)*	-0.023 (0.016)**	-0.028 (0.005)*	0.019 (0.0051)*	0.018 (0.0051)*	0.021 (0.0051)*	0.019 (0.005)*	-0.024 (0.016)**	-0.024 (0.005)*	0.019 (0.0052)*	0.018 (0.0052)*	0.021 (0.0052)*	0.019 (0.0050)*
GDP_PERCAP	0.114 (0.0057)*	0.115 (0.0059)*	0.057 (0.0119)*	0.062 (0.013)*	0.089 (0.0091)*	0.084 (0.0087)*	0.117 (0.0054)*	0.118 (0.0055)*	0.062 (0.0118)*	0.069 (0.013)*	0.083 (0.0085)*	0.088 (0.0087)*	0.117 (0.0054)*	0.118 (0.0055)*	0.061 (0.0115)*	0.067 (0.0122)*	0.084 (0.0081)*	0.087 (0.0081)*
AI	-0.148 (0.283)	-0.121 (0.288)	-0.100 (0.079)	-0.081 (0.081)	-0.159 (0.0899)**	-0.046 (0.078)												
PI							0.224 (0.260)	0.327 (0.279)	0.009 (0.075)	0.040 (0.078)	0.035 (0.075)	0.076 (0.075)						
EXP_PERCAP													-0.030 (0.019)	-0.029 (0.021)	0.001 (0.005)	0.002 (0.005)	0.002 (0.005)	0.003 (0.005)
DUMMYCRISIS		-0.037 (0.066)	-0.020 (0.019)	-0.032 (0.0173)**			-0.071 (0.070)	-0.027 (0.019)	-0.038 (0.0177)*				-0.011 (0.069)	-0.011 (0.069)	-0.025 (0.018)	-0.025 (0.018)	-0.038 (0.0173)*	
Number Observation	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Number of Region	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
R-squared	0.814	0.814	0.994	0.994	0.475	0.454	0.814	0.816	0.994	0.994	0.443	0.457	0.816	0.816	0.994	0.994	0.462	0.475

Note: Values in parentheses are standard error of coefficient. (*) means significant at level 5% and (**) means significant at 10%.