Fiscal Decentralization and Regional Economic Growth in Sumatera, Indonesia

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List of Acronyms

DAK   Dana Alokasi Khusus (Special Allocation Fund)
DAU   Dana Alokasi Umum (General Allocation Fund)
FD   Fiscal Decentralization
OLS   Ordinary Least Square
FEM   Fixed Effect Model
GDRP   Gross Domestic Regional Bruto
BPS   Badan Pusat Statistic (Indonesia National Statistic Bureau)

ABSTRACT

This paper analyzes the impact of fiscal decentralization on regional economic growth in Sumatera, Indonesia. Within the framework of an OLS, Fixed Effect Model and Random Effect Model was employed in this thesis on a set of dynamic panel data models with latent variables over a period 2007 – 2013. Two indicators of fiscal decentralization, local revenue, and local expenditure were used to measure impact of fiscal decentralization in Sumatera. Data for this study comes from secondary sources; BPS and DJAPK ministry of Finance Republic of Indonesia. The empirical finding of this study suggests that two fiscal decentralization indicators and number of population have a negative significant impact on regional economic growth. However, number of education and employment rate are positively correlated with economic growth. Finally, there is a little consensus on the relationship between fiscal decentralization and economic growth in Sumatera, Indonesia.

Relevance to development Studies

Indonesia has heterogeneous regions which are divided into two parts, West Part and East Part of Indonesia. These two parts have contributed differentially on National GDP; west part dominates this contribution for around 80 for almost 30 years from 1983 to 2013. It means after almost 15 years fiscal decentralization has been implemented by Indonesian government, the disparity of economic growth stay the same. Instead, economists and policymakers concern about this phenomenon, we want to bring some evidences which indicate the effect of fiscal decentralization on growth in one of region in west part of Indonesia, Sumatera. This is very relevance for development studies, because it could be a consideration for analyzing fiscal policy implementation in Indonesia and will contribute for development of Indonesia.

Keywords

Fiscal decentralization, economic growth, Sumatera, heterogeneous.

CHAPTER I

INTRODUCTION

1.1 Background

Many developing countries including Indonesia have given considerable attention to transformation of their government structure in the last few decades. Through economic system especially fiscal authority, these countries have changed their power from being centralized to be more localized. The importance of this reform is obvious and has stated at many literatures; decentralization is an important tool which would play a major role in improving performance of government in providing public services particularly in regional level by increasing its efficiency (Oates, 1972). The proponents of decentralization believe that this economic transition could raise a positive and potential impact on public finance outcome and public welfare. This is in line with Brueckner's argument in his article that fiscal autonomy could result in higher per labor of output and higher growth rate (Brueckner, 2006).

Strong evidences from extensive research has been resulted, it examined the link between these two aspects; decentralization and economic growth; a cross-country study (Davoodi and Zou, 1997), three years of fiscal decentralization in Indonesia; its impact on regional economic development and fiscal sustainability (Brodjonegoro, Bambang), the impact of fiscal decentralization on income inequality in Indonesia (Dyah, S), The practices of decentralization in Indonesia and its implication on local competitiveness (Darmawan, R, 2008), but, a conclusive, ultimate result is not formulated.

Fiscal decentralization is an economic reform that is widespread in developing countries during 1990s (World Bank, 2000) as one possible way to escape from the traps of ineffective and inadequate economic growth. A growing number of countries embarked on fiscal decentralization programs consisting expenditure functions and revenue sources to sub-national government. Meanwhile, Indonesia has introduced fiscal decentralization since 1974, however effectively implemented on January 2001 through the implementation

of law No.22/1999 about local government and the3 law No.25 of 1999 about intergovernmental fiscal relationship. Fiscal decentralization concept is expected to provide a stimulus for regional economic growth and a better high competitiveness and reduce inequality of income distribution vertically or horizontally to all 33 provinces in Indonesia (Simanjuntak, 2005).

In practice, decentralization requires readiness of local government to use optimality sources of local revenue such as taxes and levies to achieve better economic independence. However, Indonesia is a rich country with a lot of the island which has no evenly distributed natural resources. There is a rich area with natural resources but there is also a poor area of natural resource. This is caused by differences in endowments factor such as geography and differences in the characteristics of human resources (Ahmad, 2002).

The previous study in general showed that there is a positive effect of fiscal decentralization to economic growth in Indonesia and fiscal decentralization could be a potential trigger of economic performance in Indonesia. However, in fact Indonesia's regions are not homogenous and have different characteristic in terms of population, education and geographical area. Furthermore, based on book of Indonesia medium term planning 20015-2019 we can see that central government of Indonesia has divided Indonesia into two regions; western part of Indonesia and eastern part of Indonesia. The significant difference between these two regions is these regions have a very different economic performance which can be seen from its GDRP contribution to National GDP (picture 1), where western region dominate Indonesia's economy by contribute almost 90% to national GDP in for over 30 years.

Picture1. Regions' contribution to National GDP
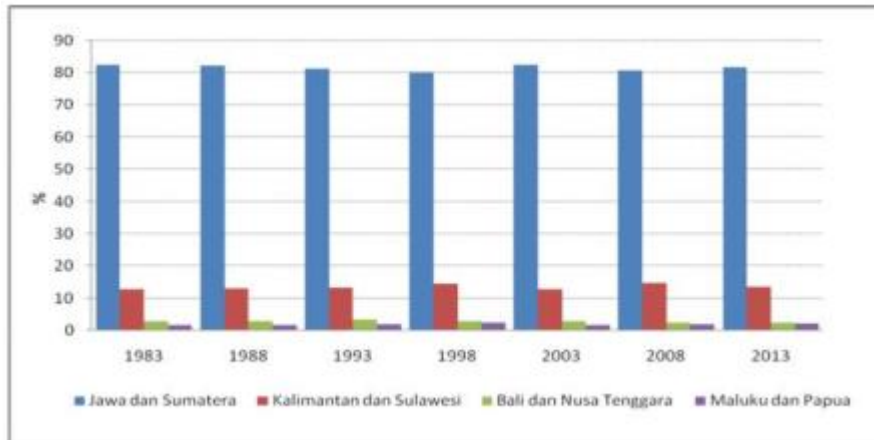
Source; book of Indonesia medium term planning 2015-2019

There is a researcher who has conducted her research about fiscal decentralization in provincial level in Kalimantan Island which is including to eastern part of Indonesia, Sri Wulani Rezeki Elida. Elida (2013) examines impact of fiscal decentralization on economic performance in 4 provinces in Kalimantan Island, and she found that there is a statistically positive relationship between fiscal decentralization and economic growth in Kalimantan. While, in western region in general has no one researcher trying to analyze the impact of fiscal power delivery to low level of government on its economic growth. This is the one of reasons why researcher doing this research in Sumatera, Indonesia.

1.2. Justification of the Study

Fiscal decentralization which reflects numeral fiscal autonomy and responsibility at multistage government in developing countries has been resurrection of attention. There are several fundamental reasons why fiscal decentralization has been adopted and implemented in the world such as escaping from ineffective and inefficient governance, and instability of macroeconomic, but the main motivation is that fiscal decentralization has

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potential ability to enhance economic growth through improving performance of public sector. Economic growth is considered as an important aspect in implementation of decentralization because it constitutes one of quantitative measurements in evaluating success of development program and seen as an objective of Fiscal Decentralization (Zhang and Zou, 2001).

Theoretically, Fiscal Decentralization is expected can be easily to identify what public's need and thus provide better public services for residents at local level to compensate disaffection and failures of central government. However, in developing countries it seems to be a calamity because instead of increasing efficiency and accountability, there is a controversy because some argue that Fiscal Decentralization can be dangerous and counterproductive. Based on Smoke and Lewis' point of view (1996), Fiscal Decentralization in developing countries raise several problems and difficulties for government institutions particularly related to prominent deficiencies in infrastructure development because there is no one institution plays as a key control and it leads to bad coordination among those institutions. Furthermore, Smoke and Lewis (1996) found some problem caused by "large unproductive competition" between institutions to attract donors[1]. From those theoretical and empirical review shows that the link between Fiscal Decentralization and economic growth is an empirical circumstance which needs to be cleared up.

This research is accordingly, substantial for a number of reasons. First, the paperwork on fiscal decentralization in developing countries has blown up over the years, nevertheless these research have focused more on specific regions; Sumatera Island. Secondly, the study set up a foundation for policy-makers for succession improvement of local government in specific regions. Finally the formularized theory could be applied by economists with a

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[1] "Difficult institutional problems are reinforced by the interests of donors. Donors create relationships with ministries which share their sectoral and geographical interests and have the capacity to move projects and money rapidly, fostering largely unproductive competition - not only across donor agencies, but also among their client ministries. Furthermore, there are few reasons for either donors or ministries to be interested in authentic decentralization, which requires gradual institution building and reduces donor and central government control over resource allocation" (Smoke and Lewis, 1996).

valuable specification for estimating the impact of fiscal decentralization on economic growth.

1.3. Research Question

The research aims to examine what is the effect of the implementation of fiscal decentralization on regional economic growth in 10 provinces in Sumatera Island which consist of ten provinces in Sumatera: Nanggroe Aceh Darussalam, North Sumatera, West Sumatera, Riau, Riau Island, Jambi, South Sumatera, Bangka Belitung, Bengkulu and Lampung.

1.4 Limitation of The Study

There are two limitations of the study. First, this study is conducted in one specific island in Indonesia, Sumatera. This paper will investigate all ten provinces in Sumatera, however, because the limitation of the data available, I only used three variables in this research over the period 2007-2013. Secondly, the researcher is ordinarily resident within the island, hence the possibility of preconception.

CHAPTER 2. LITERATURE REVIEW

2.1 Background

The issue of fiscal decentralization in developing countries obtained a significant attention from 1980s[2]. Conversation about this regarding most blossomed way of promoting economic growth has involved government institutions leaders, politicians and societies. The establishments of fiscal decentralization vary across the regions. That is therefore necessary to undertake an analysis of effect of fiscal decentralization in the region. This chapter makes a try to provide concept, methodology and empirical problem of fiscal decentralization.

2.2 Fiscal Decentralization in Developing Countries

Richard Musgrave, Wallace Oates, Charles Tiebout, and James Buchanan are known as cofounders of fiscal decentralization theory. Based on the theory, fiscal decentralization can be defined as a government program to delegate fiscal power to any regional or level of government below the center, such as provinces, cities or districts and municipalities. In this delegation process, the local government not only has a responsibility to implement the decision but also has an authority to make decisions on their budgetary planning. The execution should be started with a comprehensive design, and in that case, fiscal decentralization denotes the role of sub-national government to contribute intensively in development.

Fiscal decentralization is an essential ingredient for generate some benefit for local government. The proponents of this issue argue that local government and public services could be improved in three ways. First, the closeness of local government to their societies boost "efficiency in economic", because it gives a better understanding of citizen needs due to better allocating resources (Oates, 1972). It could be achieved since there is a match

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[2.] To improve performance of government institutions and public service delivery, many developing countries have started to shift government power from centralize to more localize by increasing "allocative efficiency" and "productive efficiency" (The World Bank, 2001).

between public goods and public preferences. It could reduce over or/and under consumption of public goods and services. Thus, the fiscal decentralization may lead increasing society welfare and the standard of living. Secondly, fiscal decentralization urges local government to improve its accountability and transparency. It makes government more responsive to their societies, and reduces corruption rate significantly (Weingast, 2006). Finally, the participation of citizen enhances government to provide a better basic infrastructure which increases the productivity in the long term (World Bank, 1994). These all benefits will lead in increasing "local capacity in the areas labor, capital and technology" (World Bank, 1995a).

However, large and developing countries tend to have problem with fiscal decentralization. Fiscal decentralization could cause greater inequality among regions (Prud'homme, 1995). After implementation of fiscal decentralization, central government will distribute incomes and taxes unequally across regions. According to Theißen (2001), this phenomenon could be a hindrance of macroeconomic stability and thus economic growth would move very slowly. Another strand of argument is fiscal decentralization also considered more applicable and more beneficial for more developed and small regions which have homogenous societies (Theißen, 2001), where the citizen preference can be easily works.

From several strong theoretical arguments above, both proponents and opponents, we can see there are no straightforward outcomes from fiscal decentralization. A very wide issue of fiscal decentralization, from public service delivery to poverty reduction or improving society welfare, could be a consideration to accept some tools of measurement of fiscal decentralization effect for development. Similar with Zhang and Zoo (1998), Davoudi and Zou (1998), Yilmas (1999), Lin and Liu (2000), Akai and Sakata (2002), and Thießen (2003), Woller and Phillips (1998) measured fiscal decentralization in the ways below:

- Using local government revenues to total government revenues' ratio
- Using local government revenues less grant in aid to total government revenues' ratio
- Using local government expenditures ratio to total government expenditures' ratio

- And using local government expenditures to total government expenditures less defense and social security expenditures' ratio.

Accordingly, from Shah (1994) and Davey's (2003) point of view, fundamental aspects which are also related to authorities and responsibility empowerment of local government is determination of its revenue and expenditure. Where the policies of expenditures are implemented in local level, but get a financial support from national level of government (Lamichane, 2012). Furthermore, in expanding notion of fiscal decentralization, it can refer to the set of policies designed to increase the revenue or fiscal autonomy of sub-national government and manage the potential local region for optimizing public welfare. An increases transfer from the central government, the creation of new sub-national taxes, and the delegation of tax authority are all examples of fiscal decentralization. It should be viewed as a comprehensive system. The decentralization effort includes the expenditure and revenue assignment to local level.

2.2 Historical Background fiscal Decentralization in Indonesia

Indonesia is a state with very vast territorial area. This country has immense amount of diverse ethnic and cultural groups, from one region to another. Furthermore, every region in Indonesia experience different level of economic development severely due to these regions has different natural endowment resources. This kind of diversity has sought to build a sentiment of desire of the fluctuation notion of fiscal decentralization among the regions. But, after achieving independence, Indonesia becomes unitary nation and all regions become more dependants to central government. It wastes the regional holding capacity to contribute to development and to accommodate public preference.

However, in 1975, there was a serious concern from central and local government to promote development regionally. This law underlined the autonomy in the regional level since they are closer to their societies compare to central government and would play an important role to serve better public services delivery. The government established and

passed law no. 5/1975 about decentralization system. But, the effort to implement this law tends to be very low and make this looks useless because some regarded this law was not eligible and need to be revised (Ham and Hady, 1998) [3]. In addition, in this era, central government exercised a significant take control for all local government functions, from appointment of sub-national government to the use of state finance. This highly centralizes performance of central government leads unaccountability of local government to their community's make the law no5/1975 did not work in a good way and seems ineffective.

Since the limited authority of regional government restricted them to manage and organize their own resources, there was a pressure to change intergovernmental relationship between local and central authority. Government followed up this insistence to be decentralized by establish law no 22/1999 and 25/1999 as a revision for law no 5/1975. According to Usui and Alisyahbana (2003), the implementation of this law changed Indonesia's government structure drastically from dramatically centralized to extremely decentralize. This law has eliminated the hierarchical relationship between region and central government.

Under the law 22/1999, democratic system of local government has successfully established. Even though, this process is not easy since Indonesia has a heterogeneous and large variation among regions. It needs a big effort from central government to implement this system to all regions. It even leads some regions like Aceh, Papua and any other region to be independent. However, Indonesia could have adjusted with the peace and without any chaos (Brojoneoro, B, 2002).

In general, implementation of fiscal decentralization in Indonesia has five purposes: "(1) increase national allocation and regional government efficiency; (2) meet regional aspirations, improve overall fiscal structure, and mobilize regional and therefore national revenues; (3) enhance accountability, increase transparency, and expand constituent participation in decision making at the regional level; (4) lessen fiscal disparities among

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[3]. According to Ham and Hadi (1998), the highly centralized of government performance in fiscal structure progressively assisted to drop its accountability, negatively affected the rates of return on public sector projects, and restrained the local institutions development.

regional governments, assure the delivery of basic public services to citizens across the country and promotion of government efficiency objectives; and (5) improve social welfare of Indonesians" (Suhendra and Amin, 2006). All of these goals are supported by central government by establish some regulation and allocating funds to every region to finance their administration.

The funds transfer to local government consists of revenue sharing, special allocation fund or Dana Alokasi Khusus (DAK), and general allocation fund or Dana Alokasi Umum (DAU). Revenue sharing is revenue which comes from accessing and controlling their own resources, usually it comes from oil and gas, property taxes and domestic personal income[4]. DAU is regarded as the main resource of revenue for sub government. While the DAK is used for fund special needs in the regions. These three kinds of fund transfer are such dominant sources of funding for local government. This transfer gradually increases over a period 2007 to 2013. In total, it increased by 45% for revenue sharing, 42% for DAU and 36% for DAK. It means in average local government can only fulfill 55% of local needs from their revenue and the rest are relied on national fund transfer.

Table 1. Fund Transfer from Central Government to Regional Government (Rp. Trillion)

Funds/Year	2007	2008	2009	2010	2011	2012	2013
Revenue Sharing	62.941	978.420	276.129	992.183	696.909	108.421	7101.962
DAK	16.237	8 20.787	324.707	420.956	324.803	526.115	931.697
DAU	164.787	4179.507	1186.414	1203.571	5225.533	7273.814	4311.139
Total	**62.941**	**978.420**	**276.129**	**992.183**	**696.909**	**108.421**	**7101.962**

Source: DJAPK, Ministry of Finance

[4.] "Starting FY 2009, 84.5% of oil revenues will accrue to the central budget and 15.5% to sub-national governments. For gas revenues, 69.5% will go to the central and 30.5% to the regions" (Suhendra, 2006).

Money transfer from central to local government increased in nominal and also in real value from year to year. It makes local government still dependent to central government in terms of sources of funding.

Meanwhile, Indonesia recorded increasing ratio sub-government expenditure of national expenditure from 24, 75% in 2001 to 30, 46 in 2013. It shows public decision moved closer to societies, and public service distribution more liable for satisfying local needs (Alisyahbana, 2003).

Table 2. Regional Government Spending in National Budget

Year	Regional Spending (Rp. Trillion)	GDP	% Regional Spending of GDP (Rp. Trillion)	National revenue (Rp. Trillion)	% Regional Spending of national Revenue (Rp.Trillion)	National Spending	% Regional Spending of national Spending (Rp.Trillion)
2007	174.82	3.556,33	4,9	706,10	24,75	757,64	23,07
2008	222.00	4.271,04	5,1	979,30	22,66	985,73	22,52
2009	239.05	4.653,53	5,1	847,00	28,22	937,38	24,55
2010	223.50	5.295,07	4,2	992,24	22,52	1.042,11	21,44
2011	312.96	6.028,80	5,1	1.205,34	25,96	1.294,99	24,16
2012	389.01	6.733,16	5,7	1.357,38	28,65	1.548,31	25,15
2013	464.60	7.578,11	6,1	1.525,18	30,46	1.683,01	27,60

Source: DJAPK, Ministry of Finance

Since the one of main objective of fiscal decentralization in Indonesia is to support better public service delivery need to be financed, the government started to revised law no. 25/1999 by law no.33/2004. It regulates many instruments which can be used for finance expenditure in lower level government. This step toward encourages local administration to impose taxes and levies to raise more revenues. For examples: local power in Lampung, East Java, and Riau can introduce distribution taxes for goods moving in and out of the region. Unfortunately, this implementation creates new problems for local governments, because they are regarded make environment not

conducive for businessman, greater disparity between regions and abusive power of the government.

Now, the initial challenge for local government and policymakers is to annually decrease risks which are associated with fiscal decentralization. New responsive regulations are needed to deal with some problems and skepticism over the implementation of fiscal decentralization.

2.3 Fiscal Decentralization and economic growth

Implementation of fiscal decentralization in Indonesia and some countries in the world has been researched by some economists and scholars. Most of these researches are still looking for the effects of fiscal decentralization on economic growth. Even though based on the theory, there is a consensus that fiscal decentralization promotes public service delivery and efficiency of resources allocation at regional level, there is no clear result about the direct impact of fiscal decentralization on economic growth (Brodjonegoro, 2005).

Based on Todaro's (2003) point of view, there are three components of economic development; capital accumulation, population growth and advance in technology. Capital would create job opportunity and absorb employment and technology will increase productivity, and finally could induce acceleration of development. Positive linkage these three component with financial decentralization could enhance a better way of development. Development should be able to change the overall system moving forward and increase economic in a long term.

There has been an extensive empirical analysis of the impact of fiscal decentralization on development. This link has been well documented as a measurement of impact fiscal decentralization on economic growth across countries. Overall, the literatures are aligned into two compounds: those who propose to point out a positive linkage between fiscal decentralization and economic growth and the rest are stay in a negative result. Phillips

and Woller (1997), Davoudi and Zou (1998), Martinez and McNab (2001) are researchers who found a positive impact of fiscal decentralization on economic growth in United sated and developed countries. Meanwhile, Zhang and Zhou (2001) showed a negative result of fiscal decentralization in provincial level in India.

Share of revenues or/and expenditures regional government regarded as important aspect of fiscal decentralization. It called as pillars or base of fiscal decentralization and has positive correlation with the level of economic development. Revenue assignment or revenue sharing is a necessary tool to obtain better economic conditions, higher quality public service delivery and increase economic efficiency. This assignment should be followed by solid expenditure to support fiscal decentralization process (Martinez, 1994). Since responsibilities of expenditure have been shifted to regional government, it should be able to a good function of goods and services to societies. In general, these two functions should be able to give more beneficial for local societies.

2. 4. Empirical Evidence

As a subject of investigation by economists and policy analysts, relationship between fiscal decentralization and economic growth has been highlighted by previous studies. In what follows, I give an overview of empirical studies which has investigated the impact of fiscal decentralization on economic growth. This is not a comprehensive list of studies, but it could be the most relevant studied cited by researchers.

Well-known as a pioneer of decentralization studies, Oates (1985) examined effect of decentralization on state government level in 48 countries in United Stated and in 43 countries developing and developed countries around the world. Oates found insignificant effect in his hypothesis for both cases. A year after, Nelson (1986) also conduct the same research in United State and again found there is no significant effect of decentralization on growth. Oates (1985) and Nelson (1986) in their studies used share of government expenditure in total economy to measure the effect of decentralization on economy growth.

In 1988, Marlow conduct the same work with different analysis, he also found negative impact of decentralization in United State. Where, Marlow focused on local government expenditure in total state economy's expenditure.

However, some scholars and researchers who investigate the relationship between fiscal decentralization and economic growth in China found there is a positive significant effect of decentralization on growth. For example, by using panel data in 28 provinces in China from 1970 to 1990, Lin and Liu(2000) examines the relationship of fiscal decentralization on growth. To measure the this relationship, Lin and Liu use share of government budgetary revenue which is retained by province. They found that China's overall (national) growth rate is positively related to fiscal decentralization and they attribute this to efficiency improvements of resource allocation rather than fiscal decentralization inducing more investment. However in contrast Zhang and Zou (1998, 2001), using provincial data, they found there is a negative association between China's provincial growth and fiscal decentralization which has implemented by local government and they argue that key infrastructure projects which have nationwide externalities, which are too decentralized in China compared to other countries are the key reason for this result. So for China the conclusion is that fiscal devolution has differential effects at the local and national levels.

Cross country research also conducted by Davoodi and Zou (1998), and Woller and Phillips (1998), they have carried out some studies on relationship between economic growth and decentralization in some developing and developing countries. The research by Davoodi and Zou (1998) found a significant negative correlation between fiscal decentralization and economic growth. It used panel data over a period 1970 to 1989 in 46 developed countries. Meanwhile, Woller and Phillips (1998) did their research in 23 developing countries by using panel data from 1974-1971. The result indicated that fiscal decentralization has negative significant effect on economic growth.

2.5. Model and specification Method

The aim of this research is to assess whether implementation of fiscal decentralization in Sumatera, Indonesia give statistically positive significant effect on economic growth. This research is going to follow model which adopted from Akai and Sakata (2002) which used simple OLS as follows. . In general, growth model which involve fiscal decentralization can be formed as follow;

$$dY = \alpha_0 + \alpha_1 \text{ fiscal decentralization} + X_i \beta + e_1$$

where dY indicates growth rate which represented by per capita GDRP; X_i represents control variables for economic growth; ε is an error term; α and β = parameters to be estimated.

Moreover, this research also considers population, employment, human capital as controlling variables. For human capital, it uses average years of schooling as proxy. Therefore, the growth regression can be modified as follow:

$$Y_{(I,t)} = \beta_0 + \beta_1 FD_{(i,t)} + \beta_2 \text{ initial\_GDRP}_{(I,t)} + \beta_3 Pop_{(I,t)} + \beta_4 \text{ employ}_{(i,t)} + \beta_5 \text{ educ}_{(I,t)} + e$$

Where;

$Y_{(I,t)}$	= the economic growth representing the growth rate of per capita Gross Domestic Regional Product
FD	= Fiscal decentralization indicator which involves two fiscal Decentralization indicators (FD1 and FD2)
	FD1 = ratio local government expenditure to total national expenditure
	FD2 = ratio local government revenue to total national revenue
Initial GDRP	= initial level of per capita GDRP each region during period t-1
Pop	= number of population
Employ	= number of employment
Educ	= average years of schooling

2.6 Data and Methodology

This research used panel data set based on provincial level in Sumatera, Indonesia. Sumatera has 10 provinces: Aceh, Sumatera Utara, Sumatera Barat, Riau, Jambi, Sumatera Selatan, Bengkulu, Lampung, Kepulauan Bangka Belitung, and Kepulauan Riau. As already mentioned in the limitation of the research, this research conduct data series from 10 provinces, data covers duration 8 years from 2007 to 2013.

Data use in this paper is secondary data which consist of Gross Domestic Regional Product (GDRP), population, employment and education are taken from data compilation by Indonesia National Statistic Bureau (BPS), while revenue and expenditure of local government are comes from Directorate General Fiscal of Balance (DJPK) Republic of Indonesia.

2.7 Research Variables

Variables used in this research based on some important variables which is related to investigation of impact fiscal decentralization on economic performance.

Table 3. Summary of variables definition

No.	Variables	Definition	Expected sign	Sources
1.	Economic growth	Natural log percapita GRDP of each province	positive	Indonesia National Statistic Bureau(BPS)
2.	Initial level of GRDP	Natural Log percapita GRDP t-1	positive	Own calculation based on data from Indonesia National Statistic Bureau(BPS)
3.	Population	Natural Log number of population	negative	Indonesia National Statistic Bureau(BPS)
4.	Employment	Natural Log number of employment	positive	Indonesia National Statistic Bureau(BPS)

5.	Education	Natural Log of education (education refers to number of population who get diploma)	positive	Indonesia National Statistic Bureau(BPS)
6.	Fiscal decentralization	Natural Log of Fiscal decentralization considering 2 fiscal decentralization indicators.	Positive	Own calculation using data from DJPK RI

CHAPTER 3
Finding and Estimation Result

3.1 Analysis the Model
3.1.1 Estimation Result of Fiscal Decentralization Effect on Economic Growth Indicator 1 (FD1)

The estimation result for this section can be seen in table 3. In the table I present two sets of empirical result. These result are outcomes of estimation involving of FD1 and FD2 using the technique of OLS, Fixed Effect and Random Effect. The first result is on effect of fiscal decentralization on economic growth of 10 provinces in Sumatera Island using indicator 1 (FD1) over the period 2007 -2013. According to Pooled OLS, fixed effect and Random Effect Method in column (a), (b) and (c) all of methods indicate negative results. For coefficient of fiscal decentralization indicator 1 (FD1), it has a value of 0.0289. This coefficient is negative and statistically significant at 1 % significance level. Moreover, the variable controls also show the significant and attain the expected sign. However, coefficient of education variable is insignificant for all of significance levels (1%, 5%, and 10%). In addition, initial GRDP variable has a statistically negative significant coefficient which is perfectly the same with expectation in the beginning of study.

The results of estimation from Fixed Effect Method (column c) tells us significant coefficient for all dependent variables at 1% level except employment variable. It has significant coefficient at 10% level. Initial GRDP has different sign compared the theory, likewise other two methods. It will be explain more detail later in part of discussion. From the statistic result, the values of R-squared for tree models are quite high.

Table 4. Estimation Result using Fiscal Decentralization Indicator 1 (FD1)

	Dependent variable : per capita GRDP		
Variables	**Pool OLS** **(a)**	**Fixed Effect** **(b)**	**Random Effect** **(c)**
FD indicator 1	-0.0289	-0.0083	-0.0399
	(0.0135)	*(0.02101)*	*(0.0206)*
Initial GRDP	1.0084***	0.8855***	0.9892***
	(0.0109)	*(0.0382)*	*(0.167)*
Population	-0.1184***	-0.0868***	-0.1452***
	(0.0784)	*(0.0580)*	*(0.0593)*
Employment	0.1375***	0.1876***	0.1848***
	(0.0771)	*(0.0775)*	*(0.0477)*
Education	-0.0012	0.0085	0.0021
	(0.0012)	*(0.0029)*	*(0.0020)*
Constant	0.5314***	2.5213***	1.1340***
	(0.2786)	*(1.2026)*	*(0.4490)*
Number observation	70	70	70
R-Squared	0.9978	0.9911	0.9483

Source: own computation based on regional statistics of Sumatera island dataset from 2007 -2013

Note: Standard errors are presented in parentheses

*Level of significance is indicated by ***, **, and * indicate 1, 5 and 10% significance level respectively*

3.2 Estimation Result of Fiscal Decentralization Effect on Economic Growth Indicator 2 (FD2)

Table 5 Estimation Result using Fiscal Decentralization Indicator 2 (FD2)

	Dependent variable : per capita GRDP		
Variables	**Pool OLS** **(a)**	**Fixed Effect** **(b)**	**Random Effect** **(c)**
FD indicator 2	-0.0343	-0.0267	-0.0191
	(0.0131)	*(0.0216)*	*(0.0093)*
Initial GRDP	1.0147***	0.8535***	0.9944***
	(0.0114)	*(0426)*	*(0.0144)*
Population	-0.1247***	-0.0848***	-0.1728***
	(0.0578)	*(0.1342)*	*(0.0677)*
Employment	0.1432***	0.2059	0.2009***
	(0.0578)	*(0.0761)*	*(0.0600)*
Education	-0.0014	0.0071	-0.0003
	(0.0009)	*(0.0031)*	*(0.0012*
Constant	0.4962***	2.2747***	0.6004***
	(0.2484)	*(1.125)*	*(0.2774)*

Number observation	70	70	70
R-Squared	0.9978	0.9892	0.9976

Source: own computation based on regional statistics of Sumatera Island dataset from 2007 -2013

Note: Standard errors are presented in parentheses

*Level of significance is indicated by ***, **, and * indicate 1, 5 and 10% significance level respectively*

Based on estimation result using OLS, Fixed Effect, and Random Effect model and indicator FD2 which is measured as ratio total own-source local government including sharing funds to total local government revenue, the relationship between fiscal decentralization and local economic growth are examined. The same procedure with previous estimation is followed, namely using three methods of panel data.

This result tells us that fiscal decentralization indicator 2 is failed to point out the effect of fiscal decentralization on economic growth. In this result can be seen all estimation results based on OLS, Fixed and Random Effect Method give negative significant results for coefficient FD 2. For controlling variables, the estimation results are statistically significant at the same significance level for each method. It is only coefficient of initial GRDP and employment variable have different level of significance, which is significant at 5% level for two methods (Pool OLS and Random Effect) and 1% level for fixed effect. Furthermore, most of controlling variables indicate the expected sign excluding initial GRDP.

Since the result of estimation on these three method fail to provide a positive statistically significant number, thus further analysis no need to be performed to determine the best model for FD2. Therefore, Hausman test is not conducted.

3.5 Discussion

3.5.1 The Effect of Fiscal Decentralization on Local Economic Growth

Based on estimation result of fiscal decentralization indicator 1 (FD1) and 2 (FD2), we can see that there are negative significant result of correlation between both indicators with economic growth in Sumatera. Under fiscal decentralization indicator 1 (FD1), it explains fiscal decentralization based on autonomy since ratio own source local government (PAD) to total local revenue. Fiscal decentralization in Indonesia does not support regions to increase local own source using tax policy and other sources, it gives an evidence that local government in Sumatera Island could not create sufficient source of local revenue. Hence, there is no significant increasing of own revenue which can be used to finance public service and infrastructure in better way. Actually, the lack of own revenue make local government in Sumatera stay highly dependent to central government in a relaively big percentage of money transfer .

Fiscal decentralization indicator (FD2), also shows that there is no positive impact of fiscal decentralization on regional growth in Sumatera. This condition indicates local government could not manage allocation of expenditure in a good way. Even though higher allocation of capital expenditure will contribute to give positive effect on economic growth, it should be arranged with many important considerations to support growth especially to fulfill local needs. This notion is in line with Lin and Liu argument. They emphasize the importance of capital expenditure in order to increase economic growth (Lin and Liu 2000).

In case of Sumatera Island, as the effect of fiscal decentralization is negative on local economic growth, it could be assumed that it is because city and regency in Sumatera Island could not manage its allocation. It assume that the proportion of expenditure for routine in the biggest proportion in monetary budget in each province. Therefore,

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expenditure of city and regency in Sumatera Island could not stimulate local economic growth in Sumatera Island. It is supported by Davoodi and Zou (1998), they argued that fiscal decentralization could be contribute to economic growth in one region because composition of government expenditure is misdirected. It especially happened in developing countries where the government official has lower skill.

3.5.2 The Effect of Other Independent Variables on Local Economic Performance

Independent variables which are used to control the effect of fiscal decentralization on economic growth initial GRDP population, employment and education. There is a consensus from previous empirical previous study which reflects that those of controlling variables consider as determinant variables affecting significant on economic growth.

Since in this regression result initial GRDP has significant positive effect on economic growth, this region would grow slower in future. According to Barro (1991), Solow (1956), and Kass (1965) the relationship between initial GRDP should be negative. They argue that a country which has high initial GRDP will experience in declining the economic growth further. If a country or region are poor country/region which has low initial income, they tend to grow faster than a rich countries, and vice versa. It will force convergence among the countries and regions. However, the evidence from estimation results contradicts Barro's result. The result shows that initial GRDP influences positively on economic growth.

The result finding on population variable shows that population has negative significant related to economic growth. Interaction between population in the Sumatera region are predicted could affect local economic growth negatively. This result is consistent with

study which is conducted by Woller and Phillip (1998), Iimi (2005). This strong negative interaction between population and economic growth is linear everywhere. Mankiew argues that economic growth could become very volatile when there is significant of increase the number of population, will affect productivity and investment in capital. Later, it contributes to reduce per worker output. In detail, more population will decrease total output which should be shared. As a result, population just receives less output (Mankiew 2003). But, in some cases increase number population could promote economic growth. It can be seen in China with higher fertility rate can grow it economy rapidly.

It is noticeable that labour force in developing countries is represented by employment variable. Based on estimation, it found that there is a positive significant relationship between employment variable and economic performance. Which means employment variable in Sumatera is statistically significantly contributes to economic growth. "Job creation produced by economic growth enhances opportunities employment which in turn increases income of poor people. Higher level of earnings would enable workers to spend more on education, thus raising the capacity and productivity their children, and creating necessary conditions for achieving higher level of economic growth in the future" (Sudrajat, 2008).

The last significant controlling variable is education. Education believed has positive connection with especially microeconomic level because it could deliver economic benefit to individuals. Even though benefit of education is different for every individual, it obviously could give significant return or individual earnings. While, the social return of education[5] exceeds the individual return. Based on regression result, variable education points out that this variable affect positively and significantly on local economic growth in Sumatera. It could be explained that how human capital in terms of education give contribution to stimulate economic growth. Education contributes to economic growth through increasing education will create more productive and skilful labor force (Todaro 2000:343). This result is different with the result revealed by Woller and Phillips (1998),

and Iimi (2005), it might be because the number of population who finished diploma or university is not that big and significant

CHAPTER 4
CONCLUSION

Even though has been implemented since 2001, fiscal decentralization in Indonesia still in the process toward to ideal form of fiscal decentralization. The present fiscal decentralization in Indonesia has delegated political and administrative power to lower level of government and also provide sufficient fund transfer to finance administration activity. However, degree of dependence local level to financial transfer to central government is extremely high. Almost 60% revenue of local government comes from revenue sharing, DAK and DAU from central government.

This research paper aims to attempt whether fiscal decentralization in Sumatera significantly determine economic performance in this region. This research use recent 2007 and 2013 rounds of panel data from ten provinces in Sumatera, empirical analysis of the ordinary least square, fixed effect model and random effect model, which employed specific variables; Gross Domestic Regional Product (GRDP) which generated by ten provinces in Sumatera and regarded as the most important variable to measure fiscal decentralization, two fiscal decentralization indicators; FD1 is expenditure and FD 2 is revenue , and three more variables which are considered as determinant of economic growth (initial GRDP, Population, employment and education). Surprisingly, the paper finds that there is statistically negative significant result of FD1 and FD on economic growth, which means fiscal decentralization did not necessarily promote economic performance in this region. The most interesting finding is this result supports the theory from Davoodi and Zou (1996) that fiscal decentralization in developing countries will lead negative sign and not significant.

Meanwhile, for variables of determinant growth such as education, and employment, comes along with theory and previous empirical study, gives a statistically positive impact on economic growth. On the contrary, population stay has a negative significant result.

This interesting finding on implementation of fiscal decentralization in Sumatera should change local fiscal policy in this region in order to could gain a benefit being decentralized. Because as we know, fiscal decentralization theoretically could bring local government closer to their societies and meet local preference, reduce income disparity, increase the standard of living, and in the end could promote economic growth in this region,

Finally, this evidence does not reflect all region in Indonesia because western part of Indonesia extremely different with eastern region in terms of culture, size, natural resources and etc. To capture the other regions, it needs to build and developed a comprehensive empirical study in other regions because different behavior can raise conflict or different resources could increased a competition among regions.

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APPENDICES

Appendix 1. of list of Provinces in Sumatera

No.	Name of Province
1.	Aceh
2.	North Sumatera
3.	West Sumatera
4.	Jambi
5.	Bengkulu
6.	Lampung
7.	South Sumatera
8.	Riau
9.	Bagka Belitung
10.	Kepulauan Riau

Appendix 2. STATA regression result for Fiscal Decentralization Indicator 1

Pooled Ordinary Least Square

```
. reg lnGDP lnexp lnpopulation lnemployment lnGDPt1 education, robust

Linear regression                                    Number of obs =       70
                                                     F(  5,    64) = 7981.88
                                                     Prob > F      =  0.0000
                                                     R-squared     =  0.9978
                                                     Root MSE      =  .04477

                              Robust
       lnGDP |     Coef.    Std. Err.       t     P>|t|    [95% Conf. Interval]

       lnexp |  -.028985    .0128538    -2.25    0.028    -.0546635   -.0033066
lnpopulation |  -.1184206   .0540974    -2.19    0.032    -.2264927   -.0103486
lnemployment |   .1375193   .0538066     2.56    0.013     .0300282    .2450104
     lnGDPt1 |  1.008452    .0113964    88.49    0.000      .985685    1.031219
   education |    -.0012    .0011382    -1.05    0.296    -.0034738    .0010738
       _cons |   .5314316   .2824729     1.88    0.064    -.0328728    1.095736

. xtreg lnGDP lnexp lnpopulation lnemployment lnGDPt1 education, robust fe

Fixed-effects (within) regression           Number of obs     =        70
Group variable: KodeProvinsi                Number of groups  =        10

R-sq:  within  = 0.9865                      Obs per group: min =         7
       between = 0.9917                                     avg =       7.0
       overall = 0.9911                                     max =         7

                                             F(5,9)            =   1077.01
corr(u_i, Xb)  = 0.4458                       Prob > F          =    0.0000
```

Fixed Effect Method

```
. xtreg lnGDP lnexp lnpopulation lnemployment lnGDPt1 education, robust fe

Fixed-effects (within) regression              Number of obs      =        70
Group variable: KodeProvinsi                   Number of groups   =        10

R-sq:  within  = 0.9865                         Obs per group: min =         7
       between = 0.9917                                        avg =       7.0
       overall = 0.9911                                        max =         7

                                                F(5,9)             =   1077.01
corr(u_i, Xb)  = 0.4458                          Prob > F           =    0.0000

                        (Std. Err. adjusted for 10 clusters in KodeProvinsi)

                             Robust
       lnGDP |     Coef.   Std. Err.       t    P>|t|    [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnexp | -.0083532   .0210608    -0.40   0.701   -.0559961    .0392898
 lnpopulation | -.0868758   .1414724    -0.61   0.554   -.4069085    .2331568
 lnemployment |  .1876898    .077522     2.42   0.039    .0123228    .3630567
     lnGDPt1 |  .8855009   .0382155    23.17   0.000    .7990514    .9719504
   education |  .0085343   .0029009     2.94   0.016     .001972    .0150967
       _cons |  2.521327   1.202699     2.10   0.066   -.1993666     5.24202
-------------+----------------------------------------------------------------
     sigma_u |  .09485068
     sigma_e |  .03433987
         rho |   .8841155   (fraction of variance due to u_i)
```

Random Effect Model

```
. xtreg lnGDP lnexp lnpopulation lnemployment lnGDPt1 education, robust re

Random-effects GLS regression                  Number of obs      =        70
Group variable: KodeProvinsi                   Number of groups   =        10

R-sq:  within  = 0.9838                         Obs per group: min =         7
       between = 0.9987                                        avg =       7.0
       overall = 0.9974                                        max =         7

                                                Wald chi2(5)       = 106561.49
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                        (Std. Err. adjusted for 10 clusters in KodeProvinsi)

                             Robust
       lnGDP |     Coef.   Std. Err.       z    P>|z|    [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lnexp |   -.03994   .0206683    -1.93   0.053    -.080449    .0005691
 lnpopulation | -.1452484   .0593272    -2.45   0.014   -.2615276   -.0289692
 lnemployment |   .184882   .0477137     3.87   0.000    .0913648    .2783991
     lnGDPt1 |    .98924   .0167296    59.13   0.000    .9564506    1.022029
   education |  .0021151   .0020899     1.01   0.312   -.0019811    .0062113
       _cons |  1.134072    .449031     2.53   0.012    .2539877    2.014157
-------------+----------------------------------------------------------------
     sigma_u |  .03044507
     sigma_e |  .03433987
         rho |  .44009768   (fraction of variance due to u_i)
```

Appendix 3. STATA regression result for Fiscal Decentralization Indicator 2

Pooled Ordinary Least Square

```
. reg lnGDP lnrevenue lnpopulation lnemployment lnGDPt1 education, robust

Linear regression                               Number of obs =        70
                                                F(  5,    64) =   8676.17
                                                Prob > F      =    0.0000
                                                R-squared     =    0.9978
                                                Root MSE      =    .04462

                            Robust
       lnGDP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   lnrevenue |  -.034346   .0131512    -2.61   0.011    -.0606185   -.0080735
lnpopulation |  -.1247532   .058448    -2.13   0.037    -.2415165   -.0079899
lnemployment |  .1432748   .0578961     2.47   0.016      .027614    .2589357
     lnGDPt1 |  1.014795    .011411    88.93   0.000     .9919985    1.037591
   education |  -.0014364  .0009871    -1.46   0.150    -.0034082    .0005355
       _cons |  .4962884   .2484362     2.00   0.050    -.0000199    .9925967
```

Fixed Effect Method

```
. xtreg lnGDP lnrevenue lnpopulation lnemployment lnGDPt1 education, robust fe

Fixed-effects (within) regression               Number of obs      =        70
Group variable: KodeProvinsi                    Number of groups   =        10

R-sq:  within  = 0.9867                          Obs per group: min =         7
       between = 0.9896                                         avg =       7.0
       overall = 0.9892                                         max =         7

                                                 F(5,9)             =   1967.07
corr(u_i, Xb)  = 0.3987                           Prob > F           =    0.0000

                          (Std. Err. adjusted for 10 clusters in KodeProvinsi)

                            Robust
       lnGDP |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   lnrevenue |  .0267213    .021695     1.23   0.249    -.0223562    .0757988
lnpopulation |  -.0848887  .1342513    -0.63   0.543    -.3885864    .2188089
lnemployment |  .2059091   .0761632     2.70   0.024      .033616    .3782022
     lnGDPt1 |  .8535555   .0426463    20.01   0.000     .7570829     .950028
   education |   .007104   .0031098     2.28   0.048     .0000691    .0141388
       _cons |  2.274722   1.125072     2.02   0.074    -.2703676    4.819812
-------------+----------------------------------------------------------------
     sigma_u |  .10332012
     sigma_e |  .03403412
         rho |  .90211396   (fraction of variance due to u_i)
```

Random Effect Model

```
. xtreg lnGDP lnrevenue lnpopulation lnemployment lnGDPt1 education, robust re

Random-effects GLS regression                  Number of obs     =         70
Group variable: KodeProvinsi                   Number of groups  =         10

R-sq:  within  = 0.9818                         Obs per group: min =         7
       between = 0.9991                                        avg =       7.0
       overall = 0.9976                                        max =         7

                                                Wald chi2(5)      =   64598.94
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000

                         (Std. Err. adjusted for 10 clusters in KodeProvinsi)

                             Robust
       lnGDP        Coef.   Std. Err.      z     P>|z|     [95% Conf. Interval]

   lnrevenue    -.0191159   .0093434    -2.05   0.041    -.0374286    -.0008031
lnpopulation    -.1728989   .0677269    -2.55   0.011    -.3056413    -.0401565
lnemployment       .20096   .0600866     3.34   0.001     .0831925     .3187276
     lnGDPt1     .9944317   .0144501    68.82   0.000       .96611    1.022753
   education     -.000337   .0012588    -0.27   0.789    -.0028043     .0021303
       _cons     .6004793   .2774582     2.16   0.030     .0566712    1.144287

     sigma_u    .02066543
     sigma_e    .03403412
         rho    .26937355   (fraction of variance due to u_i)
```

.