International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Regional Growth and Fiscal Decentralization a Case of Indonesia

Matondang Elsa Siburian[a]

Graduate School of Economics Waseda University

Email: mes1701@fuji.waseda.jp

Abstract

Decentralization in Indonesia has two distinguished characteristics in term of separation of functions and government funding. Indonesian decentralization law leaves central government with six functions: foreign affairs, defense, national security, judicial, fiscal and monetary, and religion, while local governments have to deliver other public goods to its local constituents. In terms of government funding, central government is obligated to transfer intragovernmental transfer fund to local government to support them to accomplish their functions in the form of balancing funds. This study offers new perspective on the relationship between decentralization and economic growth by exploring two different measures of regional gross domestic product (RGDP) use in Indonesia national account, such as RGDP to capture contributions of oil and gas revenue and RGDP without oil. The purpose is to level the playing field of all local government in provincial level without the influence of income from oil and gas sector. This paper employs two measurements of fiscal decentralization such as revenue decentralization and expenditure decentralization that captures both sides of local government budget. Other regional growth determinants such as demographic variables, infrastructures, government size, local economy structure, trading size in local economy, and level of investment also employed in this study. Using 33 provincial level data within the period 2000-2014 and GMM Arellano Bond estimation, this study finds out interesting result that fiscal decentralization works in opposite way toward regional growth when it measures with total output. On the revenue side, this create an incentive for poor region to remain poor and be eligible for intragovernmental transfer.

---

* Corresponding author.

On the expenditure side, intragovernmental transfer may create moral hazard on poor local government in the form of inefficient public spending. Opposite result is obtained when the study level the playing field for all local government. Both revenue and expenditure seem able to encourage growth. On the revenue side, intragovernmental transfer able to address the growth activity which confirmed by the positive and significant result of expenditure decentralization measure. Several policy implications are suggested based on the result such as: introducing reward and punishment mechanism for local government budget, relaxing tax and retribution base of local government, and introducing compulsory investment/saving for resource rich region to handle the aforementioned issues.

Key words: Regional Economic Growth; Decentralization; Revenue; Expenditure; Indonesia; Oil.

1. Introduction

Fiscal decentralization as an economic reform has proposed as a remedy for developing countries to pursue economic growth which adopted by a growing number of countries including Indonesia. The initiation of decentralization in Indonesia started after the Asian financial crisis of 1997 by introducing Law number 22/1999 regarding Local Government and Law number 25/1999 regarding Fiscal Balance between Central & Local Government. Both laws came into effect on January 1st, 2001 which later were amended by Law Number 32 and 33 of 2004 and Law Number 23 of 2014. These laws stipulate the autonomy of local government and distribution of function between central and local government. The quintessence in decentralization is the sharing of power and decision making over some economic issues to lower level of government such as performance of public delivery should be performed by agencies close to those being served [1].

Decentralization in Indonesia has two distinguished characteristics in term of separation of functions and government funding. The idea of shifting public service function to the local government comes from the idea of proximity of the local government to its local society. It assumes that the one who knows what is best for the society is no one except the society itself [2]. In terms of functions, the decentralization law leaves central government with six functions: foreign affairs, defense, national security, judicial, fiscal and monetary, and religion, while local governments have to deliver other functions to its local constituents.

To support local government, central government is obliged to procure intragovernmental transfer to all local government regularly. In terms of government funding, intragovernmental transfer is the most significant revenue source for local government in Indonesia. The basic principles for intragovernmental transfer is “money follows functions” principle, which means that the funding is following the respected government function for each level of government. The law stipulated that the amount of transfer to local government is at least 26 percent of total central government budget. National average contribution of local government’s own source revenue (fiscal autonomy) to total local revenue is less than 15 percent, while the transfer fund (fiscal dependency) contributes more than 60 percent [3]. On the expenditure side, national average of local government expenditure reached 45 percent for personnel spending, followed by capital expenditure (25 percent) and goods & service expenditure (20 percent).

After fifteen years of decentralization, although the results may vary across the regions, Indonesian GDP growth rate fluctuates around 4-6 percent per year as described in Figure 1. Theoretical study regarding the relationship between fiscal decentralization and economic growth have shown mixed results. The improvement of public sector efficiency and promote economic growth due to better knowledge of local government to respond to its local constituent [4]. On the contrary, [5] proposed opposite argument. Interestingly, previous empirical studies provide mixed results across countries. Positive relationship between decentralization and economic growth is found in 51 countries [6], in Russia [7]; Central Europe [8]; Vietnam [9]. Some studies argue that decentralization may hinder economic growth, such as in: 46 countries [10]; China [11,12]. Inconclusive result also found in several studies such as in 23 developing countries [13], OECD countries [14]; Indonesia [15].

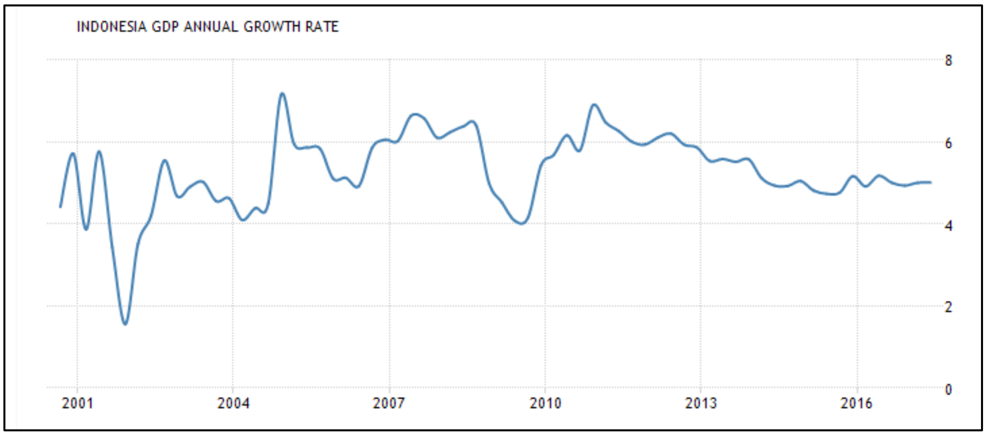

Figure 1: Indonesia GDP Annual Growth Rate

This study offers new perspective on the relationship between decentralization and economic growth by exploring two different measures of regional gross domestic product (RGDP) use in Indonesia national account, such as RGDP to capture contributions of oil and gas revenue and RGDP without oil. The purpose is to level the playing field of all local government without the influence of income from oil and gas sector. This paper employs two measurements of fiscal decentralization such as revenue decentralization and expenditure decentralization that captures both sides of local government budget. This study contributes to the literature on growth and fiscal decentralization in such that this paper examines the effect of fiscal decentralization using RGDP with oil and without oil to find out the effect of decentralization on both output measure which may affect some resource rich region significantly with different measurement of fiscal decentralization. This study makes the first attempt to explore the relationship between regional growth (with and without oil and gas sector) with revenue and expenditure fiscal decentralization measure in the region.

This study employs provincial level data on economic growth due to the limited availability of lower tier government data such as regencies/municipality data. This study focuses its analysis on socio demography and economic aspect of regional growth, other factors such as political, institutions, culture and/or other aspects, is not covered in this paper. The period coverage of this paper started from the commencing of decentralization in 2001 to the latest complete available data, that is 2014. Further study is encouraged to provide comprehensive understanding to explain decentralization effect on regional growth for countries that may have similar conditions with Indonesia.

This study is organized as follows. Section 2 offers literature reviews that summarize previous studies regarding fiscal decentralization and other macroeconomic factors that may affect economic growth. Section 3 proceeds with brief explanation of Indonesian decentralization. Section 4 introduces empirical specifications. Section 5 presents the analysis result, and section 6 present conclusion of the analysis and section 7 proposed several policy recommendations based on the analysis result.

2. Literature Reviews

There has been significant research on fiscal decentralization and economic growth. Theoretically, different researcher proposed different arguments regarding this matter. Author in [16] argues that the ability of local government to capture local needs improve the efficiency of local government to deliver public service compare to central government; decentralized provision of public goods improves social welfare to respond to different preferences under the assumptions that the government act solely to maximize welfare and uniform public goods are provided across regions [4]. Opposite perspective offers by [5] that argue government act as leviathan and operates as monopolist over local resources to its own benefit instead of maximizing its constituent welfare. More recent theoretical perspectives introduce political aspect and asymmetric information into account such as [17,18].

Mixed results also found in empirical studies. Positive relationship between decentralization and economic growth is found in China with different time period [19], [20], and [21]; United States for 1992-1996 [22]; 51 countries [6], 21 regions in Russia for 1997 [7]; Central Europe for 1990-2004 [8]; 61 regions in Vietnam for 1997-2007 [9]. On the other hand, some studies argue that decentralization may hinder economic growth, such as in: 46 countries for 1970-1989 [10]; China with different time period [11,12]. Other studies found inconclusive result such as in 23 developing countries for 1974-1991 [13]; OECD countries for 1974-1991 [14]; US and Italy [23]; and Indonesia [15].

Several macroeconomic factors that may affect regional economic growth has been listed by [24]which categorized in thirty-six categories [25]. Several factors may not be eligible to use in regional level due to several reasons because the data is not available in regional level and the data is invariant due to central government policy that uniformly applied across the regions such as exchange rates, trade policy, and government debt policy. Below is listed several macroeconomic factors used in this study which may affect regional economic growth such as:

- Population

Most research supported the assumptions that population discouraged economic growth because given limited available capital, productivity is decrease with additional people [26;27]. Other study argue that migration may increase popolation and it has positive relationship with growth [28].

- Heterogenous society

Indonesia is home more than 600 ethnic groups which speak 700 languages. A study regarding the country's ethnic and cultural diversity by [29] measured ethnic diversity across the countries using ethnic fractionalization index. Ethnic fractionalization index is an index to measure the probability of two randomly individuals in a region are from different ethnic group. The index ranges from 0 to 1, with larger index associated with more diverse society. The study found that Indonesia as a country has an index of 0.81. Previous studies argue that heterogenous society hinder economic growth through the vulnerability of society to conflict [30]; lack of trust among society members [31]; and through reducing in the investment rate, increasing public consumption [32]. This paper employs ethnic fractionalization index as used in [33].

- Employment

This factor has been supported by significant researchers as one of the growth engine in an economy. Okun's law examines the negative relationship between unemployment and economic growth. The increase in productivity is expected to rise output then make it possible for worker to earn more revenue and therefore generate higher GDP [34]. Several studies supported this argument such as authors study at regional government by [35,36] in their study in Brazil, and across countries study such as [37,38].

- Infrastructures

Many studies have examined the significant impact of infrastructures on productivity and economic development. Infrastructures work through two channels, that are, supplementary input and increasing total factor productivity. It provides better access and better distribution of provisions of public goods to the society [39,40,41]. Infrastructure also provides positive spill-over effect that support other capital work more efficiently [25]. This paper employs literacy rate and life expectancy to proxy infrastructure.

- Economic structure

Share of economic sector in the economic structure is important to capture the effect of specific factor that contributes significantly in the regional economy. This variable introduced by [42] to be considered as one of growth determinants. After the financial crisis, Indonesian economy shifted from agriculture economy to more value added sector that is manufacturing sector.

- Government spending

Effective local government spending is expected to foster growth as argues by [43,44] through provision of infrastructures. Although recent studies argue that there is a possibility of negative effect of government spending on growth. It may work through government spending on sectors which are unrelated to growth activity such as subsidy and transfer and welfare related infrastructure as described by [42,45].

- Openness

Trade shows the amount of goods and services trade by one province with other province and other countries. Openness argues as growth engine because integrated economy provides more trade in goods and flow of ideas as argue by [46]. Postitive and significant impact of trade openness with economic growth is argued by [47]. Author [48] in his study in Indonesia argues that higher growth of Indonesia can be identified with its increasing trading partners.

- Investments

The accumulation of capital in the economy to boost one economy to grow or to sustain a certain level of growth rate as argued by several researchers such as [42,26,49]. Different result argue by other studies especially in regional level, such as insignificant results on Brazil for 1975-1990 by [34] and for Vietnam for 1995-2000 [50].

The expected sign of estimation variables in this study is describe in table 1 below.

Table 1: Expected Sign of Estimated Coefficient

Independent Variables	expected sign
lpop	_
efi1	_
employ	+
REVDEC1	+/-
EXPDEC1	+/-
literacy	+
expectancy	+
mfgshare	+
lspdg	+
li	+
lx	+

3. Indonesian Decentralization

The Indonesian government structure consists of provinces, then provinces divided by regencies and municipalities. Presently Indonesia consist of 34 provinces, 416 districts, and 98 municipalities. Kalimantan Utara is the youngest province established in 2014, which before as part of Kalimantan Timur.

It is further elaborated in Law No.23/2014 regarding Local Government that has drawn a separation function between central and local government including the funding to support it and how the local government running its business. There are three main classification of government functions, as described in Figure.2.

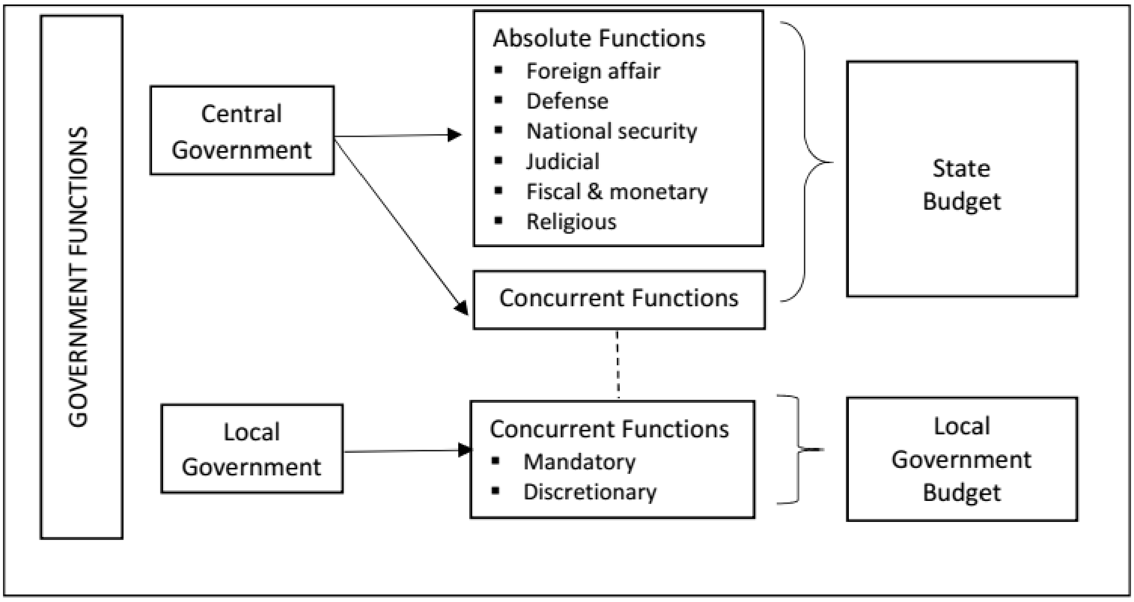

Figure 2: Indonesia Government Functions

As stipulated in the Law number 17/2003 regarding National Finance, the central government is obligated to transfer the fund to local government to support its functions. The local government revenue comprises of own source revenue (generated from local tax and retributions and other locally generated revenue); intragovernmental transfer or balancing funds from central government, and others (such as grants). Balancing fund is the most significant revenue source for local government in Indonesia. The basic principles for balancing funds is "money follows functions" principle, which means that the funding is following the respected government function for each level of government. The transfer also follows other principles such as proportional, fairness, transparent, and customized to local area capacity and circumstances. There are three (3) types of balancing funds, such as:

- General allocation fund - Dana Alokasi Umum (DAU)

DAU is a block grant and formula-based grand. Block grant refers to the utilization of the fund to the local government to perform its designated functions within the implementation of autonomy principles according to its own needs and preference. Formula-based grant meaning that there is a certain method to determine the amount of DAU transferred to local government. The fund is distributed monthly and become available before the designated month. DAU holds the largest share of the balancing fund.

- Specific allocation fund – Dana Alokasi Khusus (DAK)

DAK is an earmarked grant, it is defined as the fund originated from national budget allocated to specific local government to fund particular local government functions that correspond with national priority (it covers public service, defense, economic, environment, housing and public facility, health, culture, religion, social security, and education). The central government (technical ministries, ministry of home affairs, and ministry of finance, and ministry of development planning) determines the eligible local government to receive DAK.

- Revenue Sharing Fund (Dana Bagi Hasil – DBH)

Law No.33/2004 defines DBH as the fund allocated from the state budget based on percentage share to finance local government needs in the application of decentralization principles. DBH consist of tax revenue share, excise revenue share, and natural resources revenue share. Resource rich region is given larger share of its own resource revenue, while the rest is distributed by central government.

National average of the balancing fund's contribution is 60 percent of local government's revenue as described in table 2 below. Authors in [51,52,53] argues DAU has rewarded poor region generously to the extent that it now become a disincentive for the local regions to generates its own source revenue. Own source revenue of local government is on the average contributes only 15 percent. Government Regulation No.55 year 2005 regarding Balancing Fund stipulated that minimum amount of DAU transferred to local government is 26% of the net domestic revenue in the annual state budget which annually increase simultaneously with central government budget.

Table 2: Average Share of Local Government Revenue 2001 – 2014

Type of revenue (%)	2001	2002	2003	2004	2005	2006	2007
Own Source	6.7	8	7.6	8.3	7.8	6.8	5.67
General allocation fund (DAU)	70.3	67.9	62.8	62.1	55.8	60.8	51.31
Specific allocation fund (DAK)	1.1	0.8	3	3	3.1	5.7	5.85
Revenue Sharing Fund (DBH) - taxes	7.4	8.1	8.9	11.2	11	10.5	7.55
Revenue Sharing Fund (DBH)- natural resources	10.9	10.2	9.6	7.2	12.6	10.1	6.85
Others	3.6	5	8.1	8.2	9.7	6.1	6.93
Financing	0	0	0	0	0	0	15.84
Total	100	100	100	100	100	100	100

Table 2: (cont'd)

Type of revenue (%)	2008	2009	2010	2011	2012	2013	2014
Own Source	6.15	6.41	6.59	7.84	8.91	9.57	11.44
General allocation fund (DAU)	48.95	48.73	46.94	45.74	48.26	47.53	45.23
Specific allocation fund (DAK)	6.2	6.83	5.46	5.33	4.82	4.94	4.47
Revenue Sharing Fund (DBH) - taxes	7.28	7.05	7.6	5.66	5.41	4.51	3.56
Revenue Sharing Fund (DBH)- natural resources	8.41	6.88	8.96	8.92	8.86	7.11	7.02
Others	7.82	9.62	13.53	17.92	13.88	14.68	16.85
Financing	15.19	14.48	10.92	8.59	9.86	11.66	11.43
Total	100	100	100	100	100	100	100

On the expenditure side, personnel expenditure contributes the largest share (45 percent) followed by capital and goods and service expenditures as described in table 3. This can be interpreted that nearly half of the local government expenditure allocated to personnel salary expense, which left only limited amount to provide public goods.

Table 3: Share of local government expenditure 2001 – 2014

share of local government expenditure (%)	2001	2002	2003	2004	2005	2006	2007
goods & services	18.4	20.9	20.3	19.4	20.8	22.1	17.61
capital	17.9	19.7	22.4	18.3	20.7	27.1	30.84
grants&subsidy	0	0	0	0	0	0	1.45
social & regional allocation	0	0	0	0	0	0	6.64
salary	55.2	49.8	47.2	52.5	49.4	42	42.59
others	8.5	9.6	10.1	9.8	9.1	8.8	0.87
total	100	100	100	100	100	100	100

Table 3: (cont'd)

share of local government expenditure (%)	2008	2009	2010	2011	2012	2013	2014
goods & services	17.36	17	16.58	16.16	15.64	16.73	17.93
capital	30.06	25.84	21.24	18.41	19.72	21.46	21.39
grants&subsidy	1.79	3.12	4.86	2.51	2.34	2.5	2.02
social & regional allocation	5.68	5.97	5.54	17.75	17.54	16.77	17.72
salary	44.19	47.42	51.08	44.98	44.48	42.38	40.81
others	0.92	0.65	0.7	0.19	0.28	0.16	0.13
total	100	100	100	100	100	100	100

The significant local government spending for personnel expenditure limited the available resource to provide public goods and services such as provision of local infrastructures, social services, and subsidy. Study of [54] describes that personnel spending is extremely high by any international standard and it takes away a significant portion of production of public service such as health, education, and infrastructure and spent on unproductive uses such as overstaffing, government offices, and expensive cars; Reference [55] argues that DAU encourages local government to increase its salary; Reference [56] argues that development expenditure encourages economic growth, while personnel expense he propose that DAU creates incentives for districts proliferation; Reference [57] argue that development expenditure encourages economic growth, while personnel expense work on opposite direction.

4. Empirical Specifications

This study employs data from the implementation of decentralization from 2001 to 2014 in 33 provinces across Indonesia. Data in this study is obtained from several government agencies such as Central and Regional Statistics Indonesia (Badan Pusat Statistik - BPS), Indonesian Ministry of Finance (Directorate General of Taxes and Directorate General of Fiscal Balance), and technical ministries (Ministry of Health, Ministry of Public Works), and local governments.

The model used in this study is specified in equation (1) below:

$$y_{it} = \lambda_1 y_{it-p} + \lambda_2\, pop_{it} + \lambda_3\, efi1_{it} + \lambda_4\, employ_{it} + \lambda_5\, literacy_{it} + \lambda_6\, expectancy_{it} + \lambda_7\, mfgshare_{it} + \lambda_8\, lspdg_{it} + \lambda_9\, li_{it} + \lambda_{10}\, lx_{it} + \lambda_9 FD_{it} + \gamma\omega_{it} + \varepsilon_{it} \quad (1)$$

where i is the provinces in Indonesia, t is the time subscripts; y is the proxy of log of regional gross domestic products of province i in year t with oil ($rgdpcurr_{it}$) and without oil ($lrgdpnonoil_{it}$); pop_{it} is log of population;$efi1_{it}$ is ethnic fractionalization index; $employ_{it}$ is employment rate; $literacy_{it}$ is the literacy level to measure human capital infrastructure which performed by local government; $expectancy_{it}$ is life expectancy to measure health infrastructure as a function performed by local government; $mfgshare_{it}$ is the share of manufacturing sector in regional GDP; $lspdg_{it}$ is log of total government spending; li_{it} is log of total investment; lx_{it} is log of total trade; FD_{it} is the proxy of fiscal decentralization measures both in revenue ($REVDEC1_{it}$) and expenditure measures($EXPDEC1_{it}$); ω are panel effects; ε is the error term; γ and δ are the parameter. The statistical summary of the variables described in table 4 below.

Table 4: Summary Statistics

Variable	Obs	Mean	Std. Dev.
lrgdpcurr	459	31.62867	1.45268
lrgdpcunonoil	452	31.33219	1.37933
lpop	459	15.15173	1.018991
efi1	462	0.6195955	0.2591499
employ	457	88.24711	19.64688
EXPDEC1	462	0.0194446	0.0166425
REVDEC1	462	0.0125487	0.0113243
literacy	462	90.71261	14.10606
expectancy	462	66.60316	9.854451
mfgshare	462	0.2742955	0.1838342
lspdg	454	29.7193	1.044493
li	446	27.46573	2.46422
lx	456	30.38425	1.8414

Measuring fiscal decentralization has been long discussed in both theoretical and empirical studies due to its extensive dimensions and different strides. There is no single indicator that able to capture the comprehensive pictures and that is the reason why each dimension should measure separately as proposed by [58] and [59]. Given this reason, two different fiscal decentralization measures are introduced in this paper, that are revenue decentralization and expenditure decentralization. Revenue decentralization define as the share of local government (municipal and province) of total government revenue (aggregation of municipal, province and central government), while expenditure decentralization measures the share of local government expenditure of total government expenditure. Expenditure decentralization has been widely used to measure fiscal decentralization as it measures the degree of local government responsibility in providing public goods as argue by [60,61]. This measurement also important in Indonesia decentralization since intragovernmental transfer is decided by central government and most of the taxing right stays on central government authority, while local government only allowed to generate its own revenue based on Law number 28/2009 regarding Local Tax and Retribution.

There are several alternatives that may employs in this paper. Ordinary least square (OLS) known as best linear unbiased estimation may not be working since most of growth regression suffer from omitted variable bias. Panel effect regression may use to handle this problem since it is able to overcome omitted variable bias by introducing individual effects. However, panel effect regression might not be able to handle another issue in growth regression such as endogeneity problem from growth determinants. General method of moment (GMM) by Arellano-Bond offers solution using further lag of dependent variable as instrumental variable to overcome endogeneity problem. This paper follows traditional approach using first and second lag of regional GDP and measure of decentralization as instrumental variables. The validity of decentralization measure as instrument variable due to the fact that the decentralization policy is consistent over time, the regional growth in future period should not affect decentralization policy.

The validity of these instrument is justified by the result of both Sargan test and Hansen J-statistics test of over identifying restriction and residual autocorrelation test in this model. Sargan and Hansen J-statistics test assess the validity of restrictions of moment conditions. The null hypothesis of both Sargan test and Hansen J-statistics test is H0: overidentifying restrictions are valid. If the p-value of the Sargan test and Hansen J-statistics test is statistically significant, then we reject the null hypothesis that indicates there are problems with the instruments [62].

5. Results

Table 1 present the detail of the analysis results, as follows. The result indicates that both revenue and expenditure decentralization measures discourage regional economic growth of total GDP (including oil and gas). As aforementioned in the section 2, fiscal decentralization have several characteristics that may hamper economic growth. Several studies have argued regarding this conclusion even for the same economy, the result may be different depend on how and when the analysis is performed. One possible explanation for this result is the function of intragovernmental transfer as a balancing fund from richer region to those with small resources failed to provide incentive for factor movement that generate growth convergence as argue by study in [63] and [23] both authors proposed that economy with no significant intragovernmental transfer able to reach income convergence faster than economy with significant intragovernmental transfer. on the revenue side, local government with smaller resource (not rich in oil and gas revenue) may end up waiting for balancing fund through intragovernmental transfer channeled by central government instead of optimizing its own source revenue. Intragovernmental transfer has created disincentive for poor region to improve their ability to increase local own source revenue. This behavior makes poor region stay poor because they’re reluctant to be independent from central government who is always there to assist. In term of expenditure, the inefficient spending of local government on personnel expenditure deteriorates the regional growth in this total output economy (creates moral hazard on spending the local government budget). Poor region tends to spend carelessly since they know that central government will provide the funding for them by taking some part of resource rich region revenue as balancing fund. Cautions must be applied for resource rich provinces since oil and gas is a non-renewable resource. The diminishing oil and gas reserve will deteriorate the fiscal capacity of these provinces and it also bring extra burden to central government to provide for sufficient intragovernmental fund.

Table 5: Regional Growth Regression Result

	RGDP (1)	RGDP without oil (2)	RGDP (3)	RGDP without oil (4)
llrgdpcurr	-0.026		-0.068	
	(0.121)		(0144)	
llrgdpnonoil		0.907		0.928
		(0.111)***		(0.126)***
lpop	5.277	-0.105	6.091	-0.276
	(2.142)**	(0.629)	(1.966)**	(0.341)
efi1	3.421	-1.322	2.94	-0.48
	(4.338)	(2.371)	(3.08)	(0.994)
employ	0.009	0.01	0.012	0.007
	(0.005)*	(0.005)*	(0.004)**	(0.003)*
REVDEC1	-12.671	5.101		
	(12.42)**	(2.868)*		
EXPDEC1			-8.26	4.069
			(3.905)**	(1.65)**
literacy	0.082	-0.007	0.0915	-0.005
	(0.021)***	(0.014)	(0.019)***	(0.013)
expectancy	-0.013	-0.034	-0.025	0.025
	(0.058)	(0.020)*	(0.057)	(0.019)
mfgshare	0.389	0.501	-0.024	1.165
	(0.863)	(0.481)	(1.392)	(0.917)
lspdg	0.3	0.068	0.232	0.068
	(0.126)**	(0.055)	(0.098)**	(0.048)
li	-0.001	-0.018	-0.006	-0.028
	(0.012)	(0.011)	(0.013)	(0.023)
lx	-0.263	-0.031	-0.242	0.007
	(0.177)	(0.044)	(0.202)	(0.064)
Hansen J-statistics test Prob.	0.977	0.486	0.916	0.478
Sargan test Prob.	1.000	0.976	1.000	0.935
Arellano Bond test for autocorrelation				
2nd order Prob.	0.461	0.486	0.205	0.373
Number of observations	378			
Number of groups	33			
Number of Instruments	23			
Legend	*p<0.1	**p<0.05	***p<0.01	

When measure without oil and gas, both revenue and expenditure decentralization foster regional economic growth. Leveling the economy by taking out revenue from oil and gas sector from the economy left all region with its own source revenue from local economic activity. For several resource rich provinces such as Aceh, Riau, Kalimantan Timur, Papua and Papua Barat, the size of these economy without oil and gas shrink up to only one-third of the original size that includes oil and gas sector. It shows how much these regions depend on oil and gas sector which make them vulnerable to the fluctuation of oil price and the continuously diminishing reserve. When all region is measure without oil and gas, the intragovernmental transfer seems able to support local government to perform its function efficiently. Measuring output without oil and gas, all local government own source revenue depends on its real economic activity on local tax and retribution which type and rate is uniformly predeterminant by the central government and intragovernmental transfer from central government. The analysis result support the study that argues decentralization is able to spur the regional economic growth. In other words, without considering oil and gas sector in its economy, local government seems able to use its revenue efficiently on growth activity that in the end able to increase economic output. This argument supported by the positive and significant sign of expenditure decentralization measure. Prudent and efficient local government spending seems enabling local government to support local government to perform its functions, to address its local needs and fostering local economic growth.

Other growth determinant factor such as populations seems to foster regional economic growth except for model that measure regional GDP without oil using revenue decentralization. This may explain through the increasing of population through migration (not through fertility rate) as argue by [28]. Migration of population increasing expertise pool, experiences, ideas and perspective that benefits regional growth. Author [64] described that richer regions have access to advance in technology compare to poor region and it will increase the adoption of new technology that increase productivity faster.

Employment rate presents positive and significant effects to regional growth in all estimations. Labor is one significant factor in economic growth model. The existence of labor complements capital and technology to create output in the economy. Employment that increase value added and productivity will decrease poverty rate and at the end foster economic growth [28].

The human capital infrastructure proxied with literacy presents positive and significant relationship with regional growth. Increasing skill of human capital as an input in the production process will increase productivity and output.

Local government spending shows positive effects on regional growth in all cases. Spending on productive sector and growth-related activity such as infrastructure may create healthy business environment and increase productivity. to foster growth, local government should be able to spend its budget efficiently on growth related activity such as infrastructure and job creation. Wagner’s law states that public expenditure increases as per capita income is increasing. This is due to the financing of the expanding economy.

Supporting diagnostic test is included in the bottom part of Table 5. Both Sargan test and Hansen J- statistics test basically examine whether the restriction on moment condition is rejected and not eligible for the estimation. The probability of Sargan test and Hansen J- statistics test for all models shows there is no significant evidence to reject the null hypothesis. It shows that the all instruments are valid for the model. The result of Arellano Bond test for autocorrelation shows no autocorrelation issues on the estimation.

6. Conclusions

Despite growing literature on fiscal decentralization and regional economic growth, this study offers new perspective on the relationship between decentralization and economic growth by exploring two different measures of regional gross domestic product (RGDP) in Indonesia that is total RGDP and RGDP without oil to level the playing field to all local government on order to measure the local economy potential without the influence of oil and gas sector. This study also employs two measurement of fiscal decentralization such as revenue decentralization and expenditure decentralization that captures both sides of local government budget for both economic output measure. Several macroeconomic variables such as the employment rate, infrastructure measures, economic structure, the size of local government spending, the size of trade, and investment; socio-demographic variables such as population and the measure of diversity in the local economy also employed in this study.

Using 33 provincial level data within the period 2000-2014, this study finds out that fiscal decentralization works in opposite way toward regional growth when it measures with total output. The existence of intragovernmental transfer within total output economy seems to discourage regional growth both in revenue and expenditure decentralization measure. This may due to the inability of intragovernmental transfer to trigger productivity factor movement that initiate regional growth. Intragovernmental transfer is distributed by central government by moving a portion of revenue from resource rich region to poor region. On the revenue side, this create an incentive for poor region to remain poor and be eligible for intragovernmental transfer. On the expenditure side, intragovernmental transfer may create moral hazard on poor local government in the form of inefficient spending. Opposite result is obtained when the study level the playing field for all local government. Both revenue and expenditure seem able to encourage growth. On the revenue side, local government revenue seems able to address the growth activity. On the expenditure side, the local government spending seems to properly address its local needs and initiate regional growth. Cautions must be applied for resource rich region not to rely heavily on oil and gas sector which is vulnerable sector and has sustainability issue.

All other growth determinants variables work as expected except for population which present positive relationship with total output economy. The positive sign of population may work through the effect of migration that increase talent pool and ideas, therefore improving output.

7. Policy Implications

Based on the analysis result, there are several policy implications provided for both local and central government, such as:

- Introducing reward and punishment mechanism for local government budget

This measure works on both revenue and expenditure sides of local government. On revenue side, measure such as minimum share/level local own source revenue must be introduced. This will encourage local government to increase its local fiscal capacity and decrease its dependency to intragovernmental transfer. Since local economy potential is different, several factors must be taken into consideration to set the minimum level. Reward such as extra grants (in form of project such as road, school, public transportation, and et cetera instead of fresh money) should be introduced to persuade healthy competition among local government. The same case may work for expenditure side of local budget. For example, if a local government able to procure certain level/rate of effective spending on social welfare and/or growth-related sector, reward is guaranteed. If the opposite is true, punishment in the form of refund of intragovernmental fund refund or intragovernmental fund cut may applied.

- Relaxing tax and retribution base of local government

To decrease local dependency to central government, more revenue authority should be granted to local government. Present situation is central government limit local government own source revenue in the form of local tax and retribution. Relaxing revenue base of local government may improve the amount of own source revenue of local government and decreasing the dependency to intragovernmental transfer fund. Relaxing local tax base must also be accompanied with prudent local budget supervision administration and sound law enforcement mechanism.

- Introducing compulsory investment/saving for resource rich region

Natural resource dependent economy always faces sustainability issue due to the vulnerable and non-renewable nature of this sector. Minimum compulsory investment/saving for resource rich region should be introduced as safety net or insurance to minimize loss of significant revenue after diminishing reserve or price fluctuation of the natural resource. The booming economy because of natural resource often become the worst victim after its natural resource glory days are over. It left the economy with no reserve, no saving or investment, high unemployment, low output and higher criminal rate. This compulsory investment/saving mechanism must be carefully regulated such as investment on lower risk instrument to protect the investment and prudently supervised by independent party.

8. Study Limitations

This study is limited on:

- Provincial level data due to unavailability of lower tier government data.
- Short coverage period due to limited availability of pre-decentralization period data
- Focuses on socio demographic and macroeconomic factors due to the difficulty to find proxy for other aspect such as politics (due to uniform political system in the regional government in Indonesia).

Based on these limitations, further study is encouraged to achieved comprehensive understanding on regional economic growth after the implementation of fiscal decentralization.

Acknowledgements

The author would like to express her sincere appreciation for Prof. Matsumoto Yasumi for his guidance on this research. Finally, the author also would like to extend her gratitude to Indonesian Government through Indonesia scholarship (Lembaga Pengelola Dana Pendidikan – LPDP) as the sponsor of this research.

References

[1]. R. Broadway, R. and A. Shah. Fiscal Federalism: Principles and Practice of Multiorder Governance. University Press, New York, USA, 2009.

[2]. J. Martinez-Vazques and F. Vaillancourt, F. “An Overview of the Main Obstacles to Decentralization.” in: Decentralization in Developing Countries. J. Martinez-Vazques, Ed. Edward Elgar Publishing, London, UK.

[3]. Indonesia Statistical Bureau (2000-2015). Statistical Yearbook of Indonesia 2000-2015.

[4]. W. Oates. “Fiscal Federalism”, NY: Harcourt Brace Jovanovic, 1972.

[5]. G. Brennan and J.M. Buchanan. The Power to Tax: Analytical Foundations of a Fiscal Constitution. Cambridge University Press, 1980.

[6]. A. Iimi. “Decentralization and economic growth revisited: an empirical note.” Journal of Urban Economics, 57, pp.449–46, 2005.

[7]. R. Bahl and S. Wallace. “Fiscal decentralization and fiscal equalization within regions: The case of Russia.” Journal of Public Budgeting, Accounting & Financial Management, vol.18(1), 27-58, 2006.

[8]. R.A. Pose and A. Kroijer. “Fiscal decentralization and economic growth in Central and Eastern Europe.” LEQS Paper, vol. 12/2009, 2009.

[9]. L.P. Nguyen and S. Anwar. “Fiscal decentralization and economic growth in Vietnam”. Journal of the Asia Pacific Economy, vol. 16:1, 3-14, 2011.

[10]. H. Davoodi and HF. Zou. “Fiscal decentralization and economic growth: a cross-country study.” Journal Urban Economics vol. 43 (2), pp. 244–257, 1998.

[11]. J. Jin and H. Zou. “Fiscal decentralization, revenue and expenditure assignments, and growth in China.” Journal of Asian Economics, vol 16, pp. 1047–1064, 2005.

[12]. T. Zhang and H. Zou. “Fiscal decentralization, public spending, and economic growth in China.” Journal of Public Economics, vol.67, pp.221-241.1998.

[13]. G.M. Woller and K. Phillips. “Fiscal decentralization and LDC economic growth: An empirical investigation.” Journal of Development Studies 34 (4), pp. 139-148, 1998.

[14]. J. Thornton. “Fiscal decentralization and economic growth reconsidered.” Journal of urban economics, vol.61, pp.64–70, 2007.

[15]. T.B. Pepinsky and M.M Wihardja. “Decentralization and economic performance in Indonesia.” Journal of East Asian Studies. Vol. 11, No. 3, pp. 337-371, 2011.

[16]. C.M. Tiebout. “A pure theory of local expenditures.” Journal of Political Economics 64 (5), pp. 416–424, 1956.

[17]. B. Lockwood. “Fiscal decentralization: A political economic perspective.” Warwick Economic Research Paper. University of Warwick, vol.721.2005.

[18]. Z. Akin, et all. “Deos fiscal decentralization promotes fiscal discipline?” Emerging markets, Finance and Trade, vol. 52, pp. 690-702, 2015.

[19]. H. Jin, Y, Qian, and B.R. Weingast. “Regional decentralization and fiscal incentives:federalism, Chinise Style.” Journal of Public Economics, vol.89, pp.1719-1742, 2005.

[20]. J.Y. Lin and Z. Liu.” Fiscal decentralization and economic growth in China. Economic Development and Cultural Change, vol 49, pp.1–21, 2000.

[21]. A. Shah. “Fiscal decentralization in developing transition economies: progress, problems, and the promise.”. Policy Research Working Paper, vol.3282. The World Bank, 2004.

[22]. N.Akai and M. Sakata. “Fiscal decentralization, commitment, and regional inequality: evidence from state level cross sectional data for the United States.” CIRJE Discussion Papers, vol.315. University of Tokyo.

[23]. F. Padovano. The Politics and Economics of Regional Transfer. Edward Elgar Publishing, 2007.

[24]. S.N Durlauf and D.T. Quah. “The new empirics of economic growth”, in Handbook of Macroeconomics, vol. 1A, J.B. Taylor and M. Woodford, Ed. Elsevier: Amsterdam, pp. 235–308,1999.

[25]. Y.Vidyattama. “A Search for Indonesia Regional Growth Determinants.” ASEAN Economic Bulletin, vol. 27, No. 3, pp. 281–94, 2010.

[26]. N. G. Mankiw and D. Romer. “A Contribution to the empirics of economic growth”. Quarterly Journal of Economics, vol. 107, no. 2, pp.407–37, 1992.

[27]. R. Levine and D. Renelt. “A sensitivity analysis of cross-country growth regressions”. American

Economic Review, vol.82(4), pp 942–63, 1992.

[28]. R.J Barro and J.W. Lee. "Sources of economic growth (with comments from Nancy Stokey)." Carnegie-Rochester Conference Series on Public Policy, vol. 40, pp. 1–57, 1994.

[29]. J.D. Fearon. "Ethnic and cultural diversity by country. Journal of Economic Growth, vol.8(2), pp.195-222, 2003.

[30]. W. Easterly R. Levine. "Africa's Growth Tragedy: Policies and Ethnic Divisions." The Quarterly Journal of Economics, vol. 112(4), pp 1203-1250, 1997.

[31]. A. Alesina, E. La Ferrara. "Who trusts others?" Journal of Public Economics 85, pp. 207–234, 2002.

[32]. J. Montalvo and M. Reynal-Querol. "Ethnic diversity and economic development." Journal of Development Economics, vol 76, pp. 293-323, 2005.

[33]. A. Ananta, et all. "Quantifying indonesia's ethnic diversity". Asian Population Studies, November 2015.

[34]. R.E. Lucas. "On the mechanics of economic development." Journal of Monetary Economics, vol.22, pp.2–42, 1988.

[35]. A. Ferreira. "Convergence in Brazil: Recent Trends and Long-Run Prospects". Applied Economics 32, no. 4, pp. 479–89, 2000.

[36]. M. Higgins and D. Levy. "Growth and convergence across the US: Evidence from County-Level Data." Emory Economics 0306, Department of Economics, Emory University, 2003.

[37]. International of Labor Organization (ILO). Global Employment Trends 2013: Recovering from a Second Jobs Dibs. ILO publishing, 2013.

[38]. B. Eifert. "Do regulatory reforms stimulate investment and growth? Evidence from the doing business data, 2003–07." Center for Global Development Working Paper 159, University of California, Berkeley, 2009.

[39]. E. Gramlich. "Infrastructure Investment: A Review Essay." Journal of Economic Literature 32, pp.1176-1196, 1994.

[40]. W. Romp and J. De Haan. "Public Capital and Economic Growth: A Critical Survey" Perspektiven der Wirtschaftspolitik 8 (s1), pp. 6–52, 2007.

[41]. S. Straub. "Infrastructure and growth in developing countries: recent advances and research challenges." Policy Research Working Paper, vol. 4460. World Bank, Washington DC, 2008.

[42]. R.J. Barro and X. Sala-I-Martin. “Convergence across states and regions.” Brookings Papers on Economic Activity, vol. 1, pp. 107–82, 1991.

[43]. D.A. Aschauer. “Public Expenditure Productive.” Journal of Monetary Economics 23, pp. 177–200, 1989.

[44]. J.V.Henderson “The effect of urban concentration on Economic growth.” NBER Working Papers No.7503, 2000.

[45]. S. Folster and M. Henrekson. “Growth and the public sector: a critique of the critics.” European Journal of Political Economy, vol. 15, no. 2, pp. 337–58. 1999.

[46]. L.A. Rivera- Batiz and P.M. Romer. “International trade with endogenous technological change”. European Economic Review, vol. 35, no. 4, pp.971–1001, 1991.

[47]. J. A. Frankel and D. Romer. “Trade and Growth: An Empirical Investigation.” Working Paper No. 5476. National Bureau of Economic Research, 1996.

[48]. J.R. Temple. “Growing into Trouble: Indonesia after 1966,”, in Search of Prosperity: Analytic Narratives on Economic Growth, D. Rodrik, Ed. Princeton University Press, 2002, pp. 152–183.

[49]. J.D. Sachs and A. Warner. “Economic Reform and The Process of Global Integration (with comments and discussion).” Brookings Papers on Economic Activity, pp.1–118, 1998.

[50]. R. Klump and Nguyen T.T. “Patterns of provincial growth in Vietnam, 1995-2000: Empirical analysis and policy recommendations.” Paper from Friedrich-Alexander University of Erlangen-Nuremberg, 2004.

[51]. B. Hofman, B. and S.C. Guerra. “Ensuring inter-regional equity and poverty reduction.” in J. Fiscal Equalizations: challenges in design of intergovernmental transfers. J. Martinez-Vazques, Ed. J. Springer, New York, USA, 2007.

[52]. B.D. Lewis and P. Smoke. “Incorporating sub-national performance incentives in the Indonesian intergovernmental framework”, presented at National Tax Association Conference, Washington DC, 2009.

[53]. Fadliya and R.H. McLeod. “Fiscal transfers to regional governments in Indonesia.” Working Paper. Arndt-Corde Department of Economics, Australia National University, Canberra, 2011.

[54]. G.G. Schulze and B.S. Sjahrir. “Decentralization and public service delivery; the case of Indonesia.” University of Freiburg. Freiburg, 2014.

[55]. B.D. Lewis, et all. “Challenge to Measuring Local Government Service Delivery Performance in

Indonesia." Australia Indonesia Partnership for Decentralization Working Paper 2, 2014.

[56]. M. Harjowiryono." Lessons learned from Indonesia's fiscal decentralization," presented at the International Conference on Fiscal Decentralization in Indonesia a Decade after the Big Bang, Ministry of Finance, Jakarta, 2011.

[57]. A.A. Patunru and E.A. Rahman. "Local Governance and Development Outcomes," in Regional dynamics in a decentralized Indonesia." Hall Hill. Ed. ISEAS, Singapore, 2014, pp. 156-185.

[58]. J. Martinez-Vazquez and R. McNab. "Fiscal decentralization and economic growth." World Development, vol.31, pp.1597-1616, 2003.

[59]. D. Stegarescu. **"**Public Sector Decentralisation: Measurement Concepts and Recent International Trends." Fiscal Studies 26, pp. 301-333, 2005.

[60]. W. Oates. "Searching for Leviathan." American Economic Review, vol.75, pp.748-757, 1985.

[61]. L.R. deMello. "Fiscal decentralization an intergovernmental fiscal relation: a cross country analysis." World Development, vol.28, pp.365-380, 2000.

[62]. A.C. Cameron and P.K. Trivedi. Microeconometrics Using Stata. Stata Press, 2010.

[63]. W. Oates. "On the theory and practice of fiscal decentralization", CREI Working Paper No. 1/2007, 2007.

[64]. V. Bove and L. Elia. "Why mass migration is good for long term economic growth." Harvard Business Review April 18th 2017.