Determinants of Economic Growth In Indonesia: A Dynamic Panel Approach

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Abstract: - This study aims to analyze the composition of local government spending (education, health, marine and fisheries, agriculture, and general allocation funds), the number of poor people, rate of inflation, foreign direct investment and opinion Supreme Audit Agency against the Local Government Financial Report to economic growth in selected provinces in Indonesia. This study employs data of 18 selected provinces in Indonesia from 2010 to 2015. This research uses dynamic panel regression (dynamic VECM). The results suggest that in the long run are all variables affecting economic growth except for government spending on agriculture. In addition, the short-run relationship shows that government budget for education has short-run relationship in lag 1, government budget for agriculture in lag 2, government budget for marine and fishery in lag 2, central government funding funds to local governments in lag 2, direct investment of foreign capital in lag 1, and total population in lag 2.

Key-words: - Economics growth, VECM, selected provinces, and Indonesia.

1. Background of the Study

One of the targets of Indonesia's national development is to promote a sustainable economic growth and equity of development, including the distribution of income among regions. Indonesia's national development of the next five years needs to prioritize efforts to achieve food sovereignty, energy adequacy, management of maritime and marine resources development (Medium Term Development Plan Year 2014-2019). Given such national goals, Indonesia is challenged by three main issues: (1) Diminishing state authority; (2) weakening of the domestic economic cooperation; and (3) Outbreaking intolerance and personal crash.

The weaknesses of domestic economic are the evident from the unresolved issues of poverty, social inequalities, inequality among regions, and environmental degradation. They are caused by excessive exploitation of natural resources, food, energy, financial and technological dependence. The state is unable to fully utilize the enormous wealth of natural resources for the welfare of the people. Strengthening the domestic economic cooperation becomes even more problematic when the state is unable to provide health insurance and proper standard quality of life for its citizens, failing in reducing inequality among regions and inequality of national income. These outsanding problems could be solved by reducing reliance on foreign debt and imports in the midst of the high production tools, abundant global corporate capital, and reduced national oil reserves.

Theoretically, from economics point of view, investment is the purchase of capital or goods that are not consumed, but used for production activities in order to produce goods or services in the future. Some literatures argue related to investment and economic growth, such as: Barro (1991) argues that economic growth is not significantly related to public investment stocks; Sylwester (2000) states that Increased levels of human capital have no positive relationship, and a direct influence on growth; Mehanna suggests that trade openness stimulates investment, which in turn can boost economic growth; Nawatmi (2013) explains that investment has a positive influence on economic growth.

Practically, government spending will affect economic activities, not only promoting a development process, but also adding aggregate products. Suleiman (2012) confirms that there is a long-term relationship between government spending and national income, and public expenditures and revenues in Nigeria. Hendarmin (2013) states that the effect of government capital expenditure on economic growth is positive but

insignificant, Sujaningsih et al., (2012) argue that there is a cointegration relationship between government spending and tax on output in the long term.

The debate over the relationship between corruption and growth continues in the modern world. Economists, historians and political experts have been involving in a long debate over whether corruption endangers economic growth. The general view holds that corruption disrupts economic activities by distorting the efficient allocation of resources in the economy. Paolo Mauro (1995) argues that corruption can reduce investment, thereby reduces economic growth. Brempong (2002) states that corruption reduces the rate of revenue growth. An increase of one unit of corruption index reduces the GDP growth rate between 0.75 and 0.9 percentage points, and per capita income is between 0.39 and 0.41 percentage points. These rates are a relatively large effect given the slow economic growth in Africa. Corruption lowers the rate of per capita income growth since it reduces the productivity of existing resources and ultimately reduces investment. Nawatmi (2013) also states that corruption has negative influence on economic growth. The sincerity from the government in building this area is measured by the existence of a government system known as Regional Autonomy. In support of this, the government passed Law Number 22 of 1999 on Regional Government which was subsequently revised to Law No.32 of 2004 and Law No. 25/1999 on the financial balance between the central and regional government which was subsequently revised into Laws Law Number 33 Year 2004.

The law is the foundation for the region to develop its region independently by relying more on the capability and potential of the region. This law also gives local discretion to the regions to design various development programs that suit local needs.

From the above background, this study analyzes determinants the growth of selected provinces in Indonesia. This study is expected to prove the role of local government expenditures, particularly in the area of education, health, marine and fisheries, agriculture, general allocation funds, population and foreign investment, and opinion of the Supreme Audit Board to the Regional Government Financial Reports in promoting economic growth, creating effectiveness and harmony in regional economic development, as well as the attaintment of good governance.

Therefore, the purpose of this study is to know the effect of population size, government expenditure on education, government expenditures on health, government expenditures on marine and fisheries, government expenditures on agriculture, general allocation funds, foreign investment and opinion of the Supreme Audit Agency against Local Government Financial Statements on regional economic growth.

2. Literature Review

This part discusses some literatures concerning factors driving economic growth in some regions. Some studies show that some factors affecting economic growth, such as studies conducted by Sylwester (2000), Rustam A (2013), and Gisore (2014) state that population growth coupled with efforts to improve health, education and general welfare will promote economic growth. In addition, Shora et al., (2014) show that population growth will hamper economic development if it is not linked with productivity growth.

Economic growth is related to the process of increasing the production of goods and services in the economic activities in the society. Thus, economic growth involves the development of a single dimension, namely related to an increased in production and income. In terms of economic growth, a production process typically involves a number of product types using a certain number of production facilities (Sumitro, 1994). Given such relationship, there is a quantitative equilibrium relationship between a number of means of production on the one hand and the output of all production on the other hand. The relationship can be expressed by using mathematical formulations. Hence, tthe relationship should be modelled and tested with empirical-quantitative measurements.

Differently, development has a broader meaning compared to economic growth. The Increase in production is indeed one of the main characteristics in the development process. In addition, in terms of quantitative aspects, the development process involves changes in the composition of production, changes in the pattern of use of production resources among economic sectors, changes in the pattern of distribution of wealth and income among various economic actors, and changes in the institutional framework in the society as a whole.

The important thing in the development process is an increasing opportunities on productive employment. Economic development should open

active participation in productive activities for all members of society who are eligible to participate in the economic process. Productive economic activity contains many positive impacts, including adding real income to the majority of the population. This can increase the purchasing power of consumption both qualitatively and quantitatively.

According to Adam Smith, economic development is a process of integration between population growth and technological progress (Suryana, 2000: 55). Todaro (2000) defines development as a multidimensional process involving major changes in social structure, public attitudes, national institutions as well as the acceleration of economic growth, the reduction of inequality and the abolition of absolute poverty.

According to Rostow, economic development or transformation of a traditional society into a modern society is a process that has many dimensions. Economic development, according to him, is not only about changes in economic structure, but also about the process that causes changes in the orientation of economic organizations, changes in society, changes in the way of capital investment, changes in the way society in determining the position of a person to be determined by the ability to carry out the work and the changes of society who originally believed that human life is determined by nature, then view that man must manipulate the natural state should create progress.

The notion of economic development according to Simon Kuznets (Suryana, 2000, 64) is the ability of a country to provide more types of economic goods to its inhabitants in the long run. This ability covers technological advances, institutional and ideological adjustments. This definition has three components: first, the economic growth of a nation is viewed from the continuous increase of inventories; second, advanced technology determines the degree of growth over various goods on the population; thirdly, the widespread and efficient use of technology requires adjustment in the institutional and ideological fields so that the innovations produced by human science can be properly utilized. Boediono (1999: 8) mentions economic growth is the process of increasing output in the long run. This definition includes three aspects: process, output per capita, and long term.

According to above studies, economic development is defined as a process that causes income per capita population of a society increases in the long term. It contains three elements: (1) economic development as a process that continuously change denoting ability for new investments; (2) increasing income per capita; (3) an increase in per capita income in the long run.

3. Previous Studies

Rapid population growth poses serious implications for the welfare of mankind in the world. Its implications could be in the form of supporting or hindering economic development.

Fiscal policy is an economic policy pursued by government in managing state finance (through spending on education, health spending, agricultural expenditures, etc.). Fiscal policy deals with state revenues, originated from tax or non-tax and then allocated in the form of state expenditure as shown in the Revenue Budget.

Sylwester (2000), Mehana, Wasiaturrahma (2013), Dada (2013, Brempong (2002), Idrees and Siddiqi, 2013, Muthui et al (2013), and Nworji et al 2012) conclude that government spending on education has a positive influence on economic development.

However, studies by Shora et al (2014) conclude that government spending on education has a negative effect on economic development. Meanwhile, Olabisi et al (2012), Gisore (2014) and Al-Shafti conclude that government spending on education allocation has no effect on economic growth.

All studies on the effect of health budget on economic growth conclude that health budget bolsters economic growth. Thus, increasing of health budget affects to the better quality of public health. Ultimately, better quality of public health triggers labor productivity and pushes economic growth.

In terms of economic sector, the role of agriculture in economic development is considered as a supporting sector. Development has been defined by the structural transformation of an economy from agricultural activities to industrial economy. Thus, the role of government is needed, especially in promoting activities in agriculture through the provision of agricultural facilities and infrastructure (such as irrigation, fertilizers and seeds). Oyinbo et al. (2013) state that agricultural budget has no impact on economic growth. Meanwhile, Ebere et al., (2012) state that the government budget for agricultural sector could boost economic growth.

Government expenditures that is used to influence regional economic development (eg educational, health, transport and other

infrastructure) will result an increased economic activity and encourage economic growth. But there are also some studies, such as Hendarmin (2012) and Dagur et al., (2006) conclude that the government budget has no effect on economic growth. While, Srinivasan (2013) summarizes that the government budget has a negative effect on economic growth due to misallocation of the budget.

Theoretically, there are some negative roles of foreign companies in supporting economic development. Most studies agree that foreign investment can drive economic growth through its role in filling lack of resources between targeted investments and mobilized savings in the country.

Other studies, such as Hendarmin (2012) and Olabisi et al., (2012) argue that foreign investment actually reduces economic growth through exclusive agreements in production with the government by not re-profiting them. Shora et al., (2012) and Louzi and Abadi (2011) conclude that foreign investment has no effect on economic growth.

Osuala et al., (2013) evaluate the impact of inflation on economic growth in the context of emerging markets in Nigeria. The results indicate that there is positive and significant relationship between inflation and economic growth in Nigeria. Their study is in accordance with Behera (2014) which examines the impact of inflation on economic growth and their relationship in South Asian countries. The result shows that there is positive and significant correlation between inflation and economic growth. However, Aidi and Mwakanemela (2013) find that inflation has a negative impact on economic growth.

The relationship between poverty and economic growth can be generated from the Okoroafor's study et al,. (2013). Empirical results show that there is no correlation between poverty and economic growth in Nigeria. This result is caused by the weakness of the government's policies towards human capital development. While according to Afzal et al., (2012), poverty has a strong relationship with education and economic growth in the long run.

Regarding the relationship between corruption and economic growth, some studies argue that corruption can only promote economic growth through two mechanisms (Mauro, 1995). First, the corruption practices can speed things up so as to enable economic actors to avoid the delays of its affairs. This can support economic growth if the country's bureaucracy rules are very bad. Secondly, this corruption can encourage government employees to work harder. Those who had not been too eager to complete their routine matters became stimulated to work because of the corrupted money. In constrast, Nawatmi (2013), Brempong (2002), Hung Mo (2001) and Shora et al (2014) view that corruption would lower economic growth as well as generate inequalities among people's incomes.

4. Estimation Procedure and Data Collection

This study specifies gross domestic regional bruto (GDRP) as dependent variable with a specific equation:

GDRP = f (EDUC, HEALTH, MARINE, AGRIC, DAU, POVERT, INF, FDI, OPINI)

Where the GDRP represents gross domestic regional product, EDUC represents local government spending on education, HEALTH represents local government spending on health, MARINE represents local government spending on marine and fisheries, AGRIC represents local government expenditure on agriculture, DAU represents revenue sharing between central and Local government, POVERT symbolizes the number of poor people, INF symbolizes the amount of inflation, FDI symbolizes foreign investment, and OPINI symbolizes the assessment of the Supreme Audit Agency against the Local Government Financial Report.

Model in this research is as follows:

$$GDRP_{ti} = \beta_0 + \beta_1 EDUC_{ti} + \beta_2 HEALTH_{ti} + \beta_3 MARINE_{ti} + \beta_4 AGRIC_{ti} + \beta_5 DAU_{ti} + \beta_6 POVERT_{ti} + \beta_7 POP_{ti} + \beta_8 FDI_{ti} + \beta_9 OPINI_{ti} + e_t$$

Then we turn the model into a double log model, so the equation:

$$Log(GDRP_{ti}) = \beta_0 + \beta_1 Log(EDUCti) + \beta_2 Log(HEALTHti) + \beta_3 Log(MARINE_{ti}) + \beta_4 Log(AGRIC_{ti}) + \beta_5 Log(DAU_{ti}) + \beta_6 Log(POVERT_{ti}) + \beta_7 Log_(POP_{ti}) + \beta_8 Log(FDI_{ti}) + \beta_9 OPINI_{ti} + e_t$$

In order to obtain the precise results, there are steps by using the standard procedure. The following steps on Panel VECM procedures are as follows: Unit Root Test, Co-integration Test, Panel Vector Error Correction Model (VECM), Impulse Response Function and Variance Decomposition

Test. The details of those steps are explained as follows:

4.1 Panel Unit Root Tests

Panel unit root tests can be categorized as "first generation" or "second generation". The most notable tests of the first generation unit root tests are the Levin-Lin-Chu test (LLC) and the Im-Pesaran-Shin test (IPS). Basically, these tests are extensions of the traditional augmented Dickey-Fuller (ADF) unit root test for univariate time series modeling under the restrictive assumption of individual cross-sectional independency. Levin, Lin, and Chu (LLC), Breitung, and Hadri tests assume that there is a common unit root process so that is identical across cross-sections. The first two tests employ a null hypothesis of a unit root while the Hadri test uses a null of no unit root.

4.2 Panel Cointegration Analysis

Panel cointegration tests provide more reliable results in testing cointegration compared to individual tests. The panel cointegration tests are based on unit root testing of residuals from the OLS-wise regression, or commonly called as "Engle-Granger (EG) based" cointegration test. The EG test is derived from the basic idea of cointegration models, where two non-stationary time series are cointegrated if there are some stationary linear combination between them. Consequently, once the null hypothesis are cointegrated, residuals from their stationary linear combination are also stationary. Thus, the EG procedure requires two steps: the estimation of static OLS regression to obtain residuals, and then imposing some unit root testing to residuals (not necessarily ADF).

The extensive interest and the availability of panel data have led to an emphasis on extending various statistical tests to panel data. Recent literatures have focused on tests of cointegration in a panel setting. E-Views can compute one of the following types of panel cointegration tests according to Pedroni (1999), Pedroni (2004), Kao (1999) and a Fisher-type test using an underlying Johansen methodology (Maddala and Wu 1999).

The Pedroni and Kao tests are based on Engle-Granger (1987) two-step (residual-based) cointegration tests. The Fisher test uses a combined Johansen test.

The Engle-Granger (1987) cointegration test is based on an assessment of the residuals of a spurious regression by using I(1) variables. If the variables are cointegrated then the residuals should be I(0). On the other hand, if the variables are not cointegrated then the residuals will be I(1). Pedroni (1999, 2004) and Kao (1999) extend the Engle-Granger framework to tests the cointegration by involving panel data. The Kao test follows the same basic approach as the Pedroni tests, but specifies cross-section using specific intercepts and homogeneous coefficients on the first-stage regressors.

4.3 Panel VECM

If all variables have met the stationary in the first derivative and have passed the cointegration test, then we can proceed with the dynamic panel regression vector error correction model (VECM).

4.4 Impulse Response Function (IRF).

IRF can explain the response of one variable to a shock from other variables. So, the influence of shock of one variable because of other variables can be explained clearly. The IRF result shows the length of time needed from one variable to response the others.

4.5 Variance Decomposition.

Forecast variance decomposition is the prominent tool in interpreting the linear and non-linear multivariate time series models along with the impulse response (Lanne and Nyberg 2014). Variance decomposition aims to estimate the contribution of each variable because of changes in the system.

The data for this study is from 2010 to 2015 and 18 province. The source of each variable is shown in table 1.

Table 1. Sources of Data

Variable	Measurement	Source(s)
GDRP	Gross Domestic Regional Income (Billions of Rupiah)	Central Bureau of Statistics
EDUC	Government Expenditures for Education (Million Rupiah)	Ministry of finance Republic Indonesia
HEALTH	Government Expenditures for Health (Million Rupiah)	Ministry of finance Republic Indonesia
MARINE	Government Expenditures for Marine and Fisheries (Million Rupiah)	Ministry of finance Republic Indonesia

AGRIC	Government Expenditure on Agricultural (Million Rupiah)	Ministry of finance Republic Indonesia
DAU	Revenue sharing between central government and local government (Million Rupiah)	Ministry of finance Republic Indonesia
POVERT	Number of Poor People (persons)	Central Bureau of Statistics
POP	Total Population (persons)	Central Bureau of Statistics
FDI	Foreign Investment (million rupiah)	Central Bureau of Statistics
OPINI	Statement of the Supreme Audit Board to the Financial Report of the Regional	Financial Auditing Agency of the Republic Indonesia

5. Results and Discussion

5.1 Unit Root Test.

According to table 2, we can see the unit root test referring to Levin, Lin and Chu t*, IPS W-Stat, Fisher-ADF and Fisher-PP. The null hypothesis has the unit root test (not stationary) and the alternative hypothesis is stationary.

Tabel 2 The Result of Stationary Test at Data Level

Variabel	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square	Information
GDRP	1.19196	3.84087	6.31244	9.12964	Non Stationer
Prob.**	0.8834	0.9999	1.0000	1.0000	
EDUC	-3.80153***	0.06894	38.8251	52.8229**	Non Stationer
Prob.**	0.0001	0.5275	0.3436	0.0349	
HEALTH	-0.11051	3.06026	10.1625	8.78143	Non Stationer
Prob.**	0.4560	0.9989	1.0000	1.0000	
AGRIC	-0.43232	3.47953	5.86021	4.26393	Non Stationer
Prob.**	0.3328	0.9997	1.0000	1.0000	
MARINE	-1.29475	2.25598	14.0801	15.4137	Non Stationer
Prob.**	0.0977	0.9880	0.9996	0.9989	
DAU	-1.52441	2.98411	8.65360	11.0797	Non Stationer
Prob.**	0.0637	0.9986	1.0000	1.0000	
FDI	-3.13773***	0.48733	33.1804	42.6026	Non Stationer
Prob.**	0.0009	0.6870	0.6034	0.2082	
PROVERT	-3.81028***	-0.06677	35.9113	51.0466***	Non Stationer
Prob.**	0.0001	0.4734	0.4728	0.0495	
POP	-1.33841	2.04479	19.6571	31.4501	Non Stationer
Prob.**	0.0904	0.9796	0.9878	0.6848	

Source: data processed

According to table 2, the results concludes that all variables namely; GDRP, EDUC, HEALTH, AGRIC, MARINE, DAU, FDI, PROVERT, and POP are not stationary at level because do not pass all tests (Levin, Lin and Chu, IPS, Fisher-ADF and Fisher-PP) at alpha 5 percent. Thus, the unit root test continues at *First Difference* Level. According to table 3, the results indicate that all variables are stationary at first difference, due the *p-value* (probability) less than 5%. Give that all variables are stationary in first difference; therefore the relationship among all variables will be conducted using VECM estimation

Tabel 3 The Result of Stationary Test at First Difference

Variabel	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square	Information
GDRP	-14.0494***	-4.65018***	72.8669***	100.912***	Stationer
Prob.**	0.0000	0.0000	0.0003	0.0000	
EDUC	-22.425***	-7.58585***	95.4745***	106.563***	Stationer
Prob.**	0.0000	0.0000	0.0000	0.0000	
HEALTH	-29.393***	-7.12529***	84.0338***	92.1190***	Stationer
Prob.**	0.0000	0.0000	0.0000	0.0000	
AGRIC	-12.892***	-4.63263***	72.3377***	96.6567***	Stationer
Prob.**	0.0000	0.0000	0.0003	0.0000	
MARINE	-16.4511***	-5.23681***	75.8511***	88.9389***	Stationer
Prob.**	0.0000	0.0000	0.0001	0.0000	
DAU	-25.7702***	-8.11833***	99.9121***	107.133***	Stationer
Prob.**	0.0000	0.0000	0.0000	0.0000	
FDI	-25.7996***	-7.23695***	88.2735***	101.371***	Stationer
Prob.**	0.0000	0.0000	0.0000	0.0000	
PROVERT	-11.2457***	-3.60729***	63.5572***	80.1094***	Stationer
Prob.**	0.0000	0.0002	0.0031	0.0000	
POP	-10.0129***	-3.12137***	57.2353***	76.1381***	Stationer
Prob.**	0.0000	0.0009	0.0137	0.0001	

Source: data processed

5.2 Co-Integration Test.

Kao (1999) presented two type of cointegration test in panel data, the DF and ADF type tests. The ADF type test from Kao can be calculated from table 4

Table 4 Calculation Results of Cointegrasion Using Kao Test

Kao Residual Cointegration Test

Series: GDRP EDUC HEALTH AGRIC MARINE DAU FDI POVERT POP

Sample: 2010 2015

Included observations: 108

Null Hypothesis: No cointegration

	t-Statistic	Prob.
ADF	-3.23	**0.0006**
Residual variance	6.09E+12	
HAC variance	7.89E+12	

Source : data Processed

The null hypothesis of the Kao test is that there is no cointegration, whereas the alternative hypothesis shows cointegration. If we look at table 4, at alpha 5%, we can conclude that states null hypothesis that there is no co-integration and alternative hypothesis that there is a co-integration. In conclusion, the result indicates that all variables have ability to show cointegration in the long-term. In other words, for each short-term period, all variables tend to adjust to reach the long term equilibrium.

5.3 Panel Vector Error Correction Model Estimation.

Panel VECM shows the short-term and long-term relationships between variables. On short-term relationship, one variable tend to adapt due to a change of other variables to form the long-term equilibrium. This estimation uses lag 2 based on lag length criteria.

Table 5 Regression Analysis - Long Term Relationships

Cointegrating Eq	Model 1	Model 2	Model 3
	CointEq1	CointEq1	CointEq1
LEDUC(-1)	-0.900677***	1.121929***	-0.204736***
	(0.09141)	(0.26908)	(0.07914)
LHEALTH(-1)	0.540412***	-1.228221***	-0.174137
	(0.14507)	(0.43193)	(0.11705)

Cointegrating Eq	Model 1	Model 2	Model 3
	CointEq1	CointEq1	CointEq1
LAGRIC(-1)	0.204911	0.583429	1.208719***
	(0.15809)	(0.42007)	(0.15853)
LMARINE(-1)	0.390558***	-1.558306***	-1.108721***
	(0.12318)	(0.34472)	(0.11312)
LDAU(-1)	0.169827**	2.034816***	0.773379***
	(0.08414)	(0.25592)	(0.07144)
LFDI(-1)	-0.354731***	0.128230	-0.156160***
	(0.02974)	(0.09092)	(0.02422)
LPOVERT(-1)	-1.063509***	1.412269***	0.364054***
	(0.07931)	(0.39000)	(0.10508)
LPOP(-1)		-3.065281***	-1.535262***
		(0.34567)	(0.09663)
OPINI(-1)			-0.436239***
			(0.05099)

Source : data processed

Meanwhile in the long term estimation, all variables in model 1 affect GDRP at α=5% except for government budgets expenditure in agriculture. In the long run, there is a shift of development from agrarian to industrial sector, so that the role of industrial sector is increasingly dominant to replace agriculture sector. The government budget for education (EDUC) has a negatif impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percen on the government budget for education will decrease Gross Domestic Regional Bruto for around 0.204736 percent. Additional government budget for education is mostly used for the improvement of educational infrastructure facilities not yet on improving the quality of the graduates. In fact, the role of the private sector in Indonesia is dominant than the government.

In addition, the government budget for health (HEALTH) has a positive impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percent on the government budget for health will increase Gross Domestic Regional Bruto for 0.540412 percent due to in the long term, people has understood the importance of health. The government budget for health increases especially for the inland areas. Increasing health budgets in rural areas will encourage economic growth through improving on public health.

The government budget for agriculture (AGRIC) has no impact on Gross Domestic Regional Bruto (GDRP), but in model 3 the government budget for agriculture has a positive effect on economic growth. An increase 1 percent on the government budget for agriculture will increase Gross Domestic Regional Bruto for around 1.208719 percent.

The government budget for Marine and fisheries (MARINE) has a positive impact on Gross Domestic Regional Bruto (GDRP), but in model 2 and 3 the government budget for Marine and fisheries has a negative effect on economic growth. An increase 1 percen on The government budget for Marine and fisheries will increase Gross Domestic Regional Bruto for 0.390558 percent in model 1. In the long run the government should allocate a larger budget for marine and fisheries due to the rapid of territorial waters accompanied by the number of fish thefts by other countries

The central government budget fund to local governments (DAU) has a positive impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percent on central government budget fund to local governments will increase Gross Domestic Regional Bruto for around 0.773379 percent. This shows the policy of the government, especially the central to regional division of power is very successful in encouraging regional economic growth.

Direct investment of foreign capital (FDI) has is negative impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percent on foreign direct investment will decrease Gross Domestic Regional Bruto for around 0.156160 percent. The relationship between foreign investment and economic growth shows a negative relationship. So far, foreign investment in Indonesia has been exploring natural resources, and focusing on regions that only rely on natural resources. Hence, they have low average economic growth. Thus, the government must make a policy to raise the added value of natural products so that the investment role can be optimally used. This finding is supported by Hendarmin (2012) and Olabisi et al (2012) that foreign capital investment actually reduces economic growth through exclusive agreements in production with government. Criticisms of foreign investment have been largely undertaken due to the uneven impacts of development outcomes in Indonesia and in many cases the activities of foreign capital firms that only reinforce the

dualistic economic structure and exacerbate the distribution of income. They will divert resources from use to produce food to use to produce sophisticated goods that mostly satisfy only certain groups and tend to exacerbate the imbalance of economic opportunities between rural and urban areas with most operating in urban areas and accelerate the flow of urbanization from village to city. Foreign investment companies tend to produce unsuitable goods (only consumed by certain groups), thus encouraging the luxury consumption pattern through advertising and the resulting goods tend to use capital-intensive technology. So that, domestic resources tend to be allocated to socially unprofitable projects.

Total poor population (POVERT) has is negative impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percent on total poor population will decrease Gross Domestic Regional Bruto for around 1.063509 percent. But in model 3 total poor population (POVERT) has positive impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percent on total poor population will decrease Gross Domestic Regional Bruto for 1.063509 percent.

Total population (POP) has is negative impact on Gross Domestic Regional Bruto (GDRP). An increase 1 percent on total population will decrease Gross Domestic Regional Bruto for 1.535262 percent. While the opinion of the financial auditing agency to the local government financial statements has a negative effect, meaning that the better assessment of opinion will actually reduce economic growth. This occurs because opinion judgments are based solely on the procedures of using local budgets whether they are in accordance with the rules applied or not, but do not see the results of their work. In addition, the assessment has not been based on the performance of regional funds.

Opinion of the Supreme Audit Agency against Local Government Financial Statements has a negative relationship to regional economic growth. So far, local governments have not optimized the performance-based budget, which is implemented only limited to budget absorption, and this has not affected the outcome of each program. This finding is supported by Mauro (1995), the existence of this corruption can encourage government employees to work harder. Those who had not been too eager to complete their routine matters became motivated to work hard because of the incentives of his service money. To avoid corruption, it is necessary to optimize the institution of Financial Eradication Commission (KPK).

Table 5 Regression Analysis- Short Term

Error Correction:	**Model 1** **DLGDRP**	**Model 2** **DLGDRP**	**Model 3** **DLGDRP**
CointEq1	-0.019648***	0.011040***	0.023457***
	(0.00793)	(0.00176)	(0.00405)
DLGDRP(-1)	-0.300664***	-0.458382***	-0.456760***
	(0.12648)	(0.09163)	(0.10139)
DLGDRP(-2)	0.583942***	0.479247***	0.453827***
	(0.10354)	(0.07514)	(0.08068)
DLEDUC(-1)	-0.003451	0.011993*	0.025538***
	(0.00991)	(0.00729)	(0.00806)
DLEDUC(-2)	-0.008047	-0.008926	-0.000143
	(0.00888)	(0.00667)	(0.00687)
DLHEALTH(-1)	0.052478	0.031522***	0.002935
	(0.02388)	(0.01170)	(0.01190)
DLHEALTH(-2)	0.039137**	0.041162	0.037818***
	(0.02000)	(0.01203)	(0.01312)
DLAGRIC(-1)	0.015477	0.044449***	0.031779***
	(0.02023)	(0.01461)	(0.01514)
DLAGRIC(-2)	-0.020212	-0.002980	-0.005019
	(0.01570)	(0.01235)	(0.01334)
DLMARINE(-1)	0.040724***	0.000254	-0.004659
	(0.01654)	(0.00981)	(0.01072)
DLMARINE(-2)	0.034674***	0.018003*	0.015366*
	(0.01387)	(0.00938)	(0.00995)
DLDAU(-1)	-0.020213	-0.051347	-0.052046
	(0.04265)	(0.03068)	(0.03240)
DLDAU(-2)	-0.016143	-0.024684***	-0.031093***
	(0.01242)	(0.00931)	(0.01101)
DLFDI(-1)	-0.003504	0.002659	0.006345***
	(0.00382)	(0.00238)	(0.00264)
DLFDI(-2)	-0.006913*	-0.002401	0.000802
	(0.00382)	(0.00219)	(0.00232)
DLPOVERT(-1)	-0.173453***	-0.040129	-0.045306
	(0.07055)	(0.09627)	(0.10255)

Error Correction:	Model 1 DLGDRP	Model 2 DLGDRP	Model 3 DLGDRP
DLPOVERT(-2)	-0.399639***	-0.056475	-0.000706
	(0.06625)	(0.10532)	(0.11247)
DLPOP(-1)		-0.186107	-0.089811
		(0.13826)	(0.14598)
DLPOP(-2)		-0.426112***	-0.459963***
		(0.13737)	(0.14736)
DOPINI(-1)			0.001832
			(0.00328)
DOPINI(-2)			-0.000738
			(0.00271)
C	0.021346*	0.050202***	0.056763***
	(0.01287)	(0.00841)	(0.00963)
R-squared	0.656670	0.844685	0.837647
F-statistic	4.050324	9.732096	7.861952***

Source : data processed

The short-term relationship indicates that government budget for education (EDUC) is at lag 1 and positive influencing GDRB at α=5% for about 0.025538. It Means when there is an increase 1 percent in government budget for education on the previous one years, it will increase the gross domestic regional bruto for around 0.025538 percent. The government budget for health (HEALTH) is significant at lag 2 which has positive influence GDRB for about 0.037818 percent. It explains that an increasing 1 percent of government budget for health on the previous two years will increase gross domestic regional bruto for around 0.037818 percent.

The government budget for agriculture (AGRIC) is significant at lag 2 which has positive influencing GDRB for about 0.031779 percent. It explains that an increasing 1 percent of government budget for agiculture on the previous two years will increase gross domestic regional bruto for 0.031779 percent.

The government budget for marine and fisheris (MARINE) is significant at lag 2 which has positive influencing GDRB for about 0.015366 percent. It explains that an increasing 1 percent of government budget for marine and fisheris on the previous two years will increase gross domestic regional bruto for 0.015366 percent.

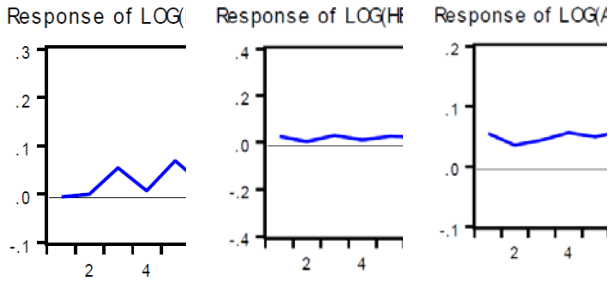
The central government funding funds to local governments (DAU) is significant at lag 2 which has negative influencing GDRB for about 0.015366 percent. It explains that an increasing 1 percent of central government funding funds to local governments on the previous two years will decrease gross domestic regional bruto for 0.031093percent.

Foreign Direct investment (FDI) is significant at lag 1 which has positive influencing GDRB for about 0.015366 percent. It explains that an increasing 1 percent of foreign direct investment (FDI) on the previous one years will increase gross domestic regional bruto for 0.015366 percent.

The last variable which significant is total population (POP) is at lag 2 which explaining an increase of total population (POP) on the previous two years will decrease gross domestic regional bruto for 0.459963 percent.

5.4 Impulse Response Function (IRF).

This test describes the response from a certain variable due to the shock from other variables. Thus, the length of afterward shock effect until the effect is gone or return to the balance point. This test shows how long the time is needed from one variable to response the shock from other variables.



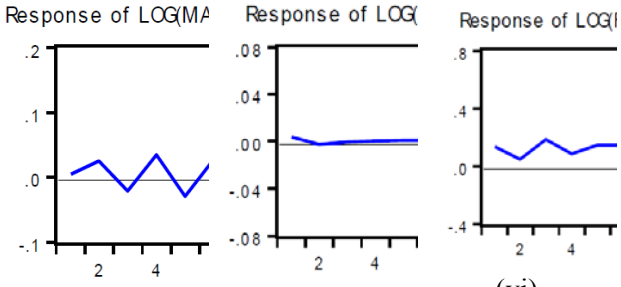
(i) (ii) (iii)

In figure (i) LEDUG starts to response the shock at the first period. LEDUC tends to respond gross domestic regional product in a fluctuative manner. Entering the second period until the eighth, the changes are very unstable. And after the eighth period the changes tend to be stable. The graph explains that the increasing in government budget for education (EDUC) will increase gross domestic regional bruto.

In figure (ii) LHEALTH starts to response the shock at the first period. LHEALHT tends to respond gross domestic regional product in a stable manner. Entering the eighth period until the ninth tends to fall, and again increased in the ninth period. The graph explains that the increasing in

government budget for health (HEALTH) will Increased slowly to gross domestic regional bruto.

In figure (iii) LAGRIC starts to response the shock at the first period. LAGRIC tends to respond gross domestic regional product in a stable manner. Entering the eighth period until the ninth tends to fall, and again increased in the ninth period. The graph explains that the increasing in government budget for health (HEALTH) will Increased slowly to gross domestic regional bruto.

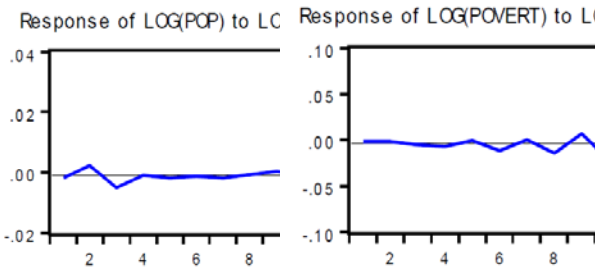


(iv) (v) (vi)

In figure (iv) LMARINE starts to response the shock at the first period. LMARINE tends to respond gross domestic regional product positively. The second to third period increases, the third to fourth period decreases, and the next period increases. And after the ninth period increases. The graph explains that the increasing in government budget for marine (MARINE) will increase gross domestic regional bruto.

In figure (v) LDAU starts to response the shock at the first period. LDAU tends to respond gross domestic regional product positively. The first period until the ninth period increased slowly, and after the ninth period there was a decline. The graph explains that the increasing in central government funding funds to local governments (DAU) will Increased slowly to gross domestic regional bruto.

In figure (vi) LFDI starts to response the shock at the first period. LFDI tends to respond gross domestic regional product positively. Entering the first to second period of decline, and entering the second period until the tenth period has increased. The graph explains that the increasing in foreign direct investment (FDI) will Increased slowly to gross domestic regional bruto.



(vii) (viii)

In figure (v) LPOP starts to response the shock at the first period. LPOP tends to respond gross domestic regional product slowly positively. Entering the first period until the second increase, and entered the second period until the third period decreased, after the third to the tenth period there was a very slow increase. The graph explains that the increasing in total population (POP) will Increased slowly to gross domestic regional bruto.

In figure (vi) LPOVERT starts to response the shock at entering the fifth period. LPOVERT tends to respond gross domestic regional product fluctuate. Entering the first period until the fifth influence of the poor on the GDRP is very stable, entering the sixth period fluctuates, and after the ninth period decreases. The graph explains that the increasing in Total poor population (POVERT) will decreased slowly to gross domestic regional bruto.

5.5 Variance Decomposition.

This test aims to know how the variance from variable is determined because of the other variables' variances. Variance decomposition is used to arrange the forecast variance from a certain variable. How much is the differences between variances after and before the shocks. It shows the percentage of forecast error of variation that is explained by another variable in the short-run dynamics and interactions.

Table 6. Variance Decomposition of LOG(GDRP)

Period	S.E.	LGDRP	LEDUC	LHEALTH	LAGRIC	LMARINE	LDAU	LFDI	LPOP	LPOVERT
1	0.013535	100.000	**0.00000**	0.00000	**0.00000**	0.00000	0.00000	0.00000	**0.00000**	0.000000

2	0.020 5	73.398	**11.6889**	0.0199	**4.7036**	0.2365	1.14 93	1.01 02	**7.74 78**	0.043 27
3	0.030 6	67.088	**7.8950**	0.2915	**2.1175**	1.4497	0.89 42	0.45 49	**19. 7783**	0.025 42
4	0.038 9	60.499	**15.433**	0.5096	**3.2221**	0.9038	0.68 04	0.67 07	**18. 0511**	0.028 54
5	0.047 5	61.137	**15.123**	0.5141	**2.9877**	0.7879	0.55 84	0.45 97	**18. 3888**	0.042 23
6	0.056 2	57.815	**16.779**	0.4727	**2.6727**	0.5777	0.46 17	0.42 81	**20. 7533**	0.037 77
7	0.063 9	57.200	**17.201**	0.4274	**2.6306**	0.5941	0.41 27	0.38 97	**21. 0577**	0.086 66
8	0.072 3	55.798	**18.516**	0.3917	**2.6120**	0.4920	0.34 30	0.34 70	**21. 3855**	0.114 46
9	0.079 5	55.410	**18.470**	0.3786	**2.6978**	0.4432	0.31 02	0.33 89	**21. 7344**	0.216 41
10	0.087 2	54.174	**19.251**	0.3565	**2.5345**	0.4134	0.27 16	0.31 02	**22. 3333**	0.355 90

Source : data processed

Table 6 displays the result of variance decomposition of gross domestic regional product (GDRP). In the first period GDRP is 100% affected by its own variable. However in the tenth period the impact of GDRP to its own variable decreases to 54.174%. The other variable tends to impact the movement of GDRP. Furthermore, GDRP is 0% affected by the government budget for education (EDUC) in the first period. But, the impact is increasing until tenth period. In the tenth period, the government budget for education (EDUC) impacts GDRP by 19.25%. Another explanation is for the government budget for agriculture (AGRIC) which 0% affects GDRP in the first period, while in the tenth period it effect GDRP by 2.53 %. For total population (POP), it affects 0% GDRP in the first period and in the tenth period it afects GDRP by 22.33%. Lastly, total poor population (POVERT) affects 0% GDRP while in the tenth period it impacts GDRP by 0.355%.

6. Conclusion and Policy Implications

From the analysis, the study concludes as follows:

6.1 In the long run, all variables affect economic growth except for government spending on agriculture. In line with the literature that economic development means a process of change from the agricultural sector to the industrial and service sectors. This can be interpreted in the long run by looking at the role of agriculture that will be reduced and replaced by the role of industry and services.

6.2 In the short-term, government budget for education is significant at lag 1, government budget for agriculture at lag 2, government budget for marine and fisheris at lag 2, central government funding funds to local governments at lag 2, foreign direct investment at lag 1, and total population at lag 2 which explain an increase of gross domestic regional bruto. Interestingly, the role of the assessment of financial institutions of the Republic of Indonesia against the Financial Report of the Local Government has no influence on economic growth. In fact, financial audits are conducted in order to provide an opinion on the fairness of financial information presented in the financial statements. Performance audit aims to assess the economic aspects, efficiency, and effectiveness, but do not see the outcomes. BPK assessment is very reasonable to be conducted, but macroeconomic performance is not achieved as expected. The government should have started implementing performance-based budgets where budgeting is structured with output orientation. By building a budgeting system that can integrate performance planning with an annual budget,

there will be a link between available funds and the expected outcomes.

From the results of the study, the central and local governments need to implement the following policies:

6.1.1 Government needs to reevaluate basic education in terms of curriculum, teaching methods, and educational evaluation. So that, it is not only the pursuit of quantity but also maintain the quality of basic education.

6.1.2 Foreign investment companies tend to produce unsuitable goods (only consumed by certain groups), thus encouraging the luxury consumption pattern through advertising and the use of capital-intensive technology. Hence domestic resources tend to be allocated to socially unprofitable projects. Central and local governments should be selective in granting permits for foreign companies, particularly those who are willing to invest in Indonesia. Especially in the case of the use of waste, labor and supporting development that support environmental sustainability.

6.1.3 The government needs to simplify procedures and optimize the role of the KPK, as well as the inherent supervisory agencies related to the use of budgets for public purposes.

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