

Impact of Fiscal Policy on the Agricultural Development in an Emerging Economy: Case Study from the South Sulawesi, Indonesia

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Abstract

The study aims to describe the impact of Fiscal policy on the agricultural development in cities and regencies of south Sulawesi. Data that used were panel data of city and regencies in 2004-2009. The study applies econometric model with simultaneous equation system. The study indicates that local government Fiscal policy especially capital spending in agricultural sector can stimulate the development of regional gross domestic product of agricultural sector. Meanwhile, non agricultural capital spending can stimulate the increasing of regional gross domestic product of private investment. Then, the private investment can stimulate the increasing at the non agricultural sector and decreasing the unemployment rate. While poverty can be decreasing when the same time the increasing of regional gross domestic product and labor absorption. The result of the policy simulation found that budgeting reallocation with decreasing other expenditures and goods and services spending, then, used to increase capital spending can give better result than policy simulation with the increasing of regional gross domestics' product and policy to increase the transfer fund from central government.

Keywords: Fiscal policy, Autonomy Region, Agricultural Development
JEL Classification Codes: C33, H71, H72, O13, R58

I. Introduction

When the national economy crisis, the fact shows that the agricultural sector prove to be a supporting national economy. The experiences with multidimensional crisis in 1997-1998 gave a valuable knowledge how strategies the agricultural as a defender, problem solver and saver for national economy. Therefore, agricultural sector plays an important role in Indonesian economy. It is proved that in 2000-2009 more than 40 million people or is about 42% of workers in Indonesia are working in agricultural sector, and contribute about 15 % to the regional gross domestic product. This fact showed that the productivity from agricultural sector still low.

South Sulawesi is a province which located in south part of Sulawesi Island, with land wide is 45 574.48 km³, consisted of 20 regencies and 3 cities, and 8 032 551 soul based on population census in 2010, and it the bigger population in east part Indonesia. Also South Sulawesi Province is a biggest result of food out of Java Island. The economy performance of regencies and cities in South Sulawesi are still dominated by agricultural sector, because this sector is offer job field for more population. In 2009, labor in agricultural is 49,20% and 29 % of the regional gross domestic product.

Even agricultural sector is a bigger income to the national economy or South Sulawesi, but the role of agricultural sector to the regional gross domestic product is decreasing and productivity is lower if it is compared with non agricultural sector. Priyarsono, at al. (2005) and Darsono (2008), said that productivity in agricultural sector since 1970 until 2005 decreased, this is indicated by the decreasing of the result of agricultural sector in regional gross domestic product, labor productivity and absorption, and export sector of agricultural products.

Since 2001, Indonesia started with new era in governmental activities. When the law no. 22 year 1999 about local government is implemented, then revised with law no. 32 year 2004, and the law no. 25 year 1999 about financial equilibrium between central and local government then revised with the law no. 33 year 2004.

In autonomy era nowadays, local government has the most authority to use their fiscal resources. Currently, province and regencies and cities government conducted at least 36% from total public expenditures, compared with the middle of 1990s just about 24%, (World Bank. 2007).

Felstenstein and Iwata (2005), used time series data in 1952-2006, with *vector autoregressive* model (VAR), found that economy decentralization has positive correlation with output riil growth in china, however, has negative implication in inflation rate.

Fiscal policy is the other form of governmental interference to influencing of economy by meant the economic condition is not too bias with good condition with *policy instrument variable* tool such a *taxes*, *government transfer*, and *government expenditure*. Fiscal policy is also called *budgetary policy* and is done through The State Budget, (Romer, 2001).

Mehmood and Sadiq (2010) used time series data 1976-2010, with *error correction model* (ECM), in analyzing the relationship of short term and long term between government expenditure and poverty in Pakistan. The study found that there was mutual correlation between government expenditure and poverty rate whether in short term or long term. Also found that government expenditure in economy sector that effective and efficiency can increase the private investment, open wielded job opportunity and decrease the poverty.

Fan and Rao (2003) studied about the trend of government expenditure in development countries. They found that government expenditure in agricultural sector can stimulate the economy growth in Africa and Asia. Izuchukwu (2011), used panel data in 1986-2007 in studying about the contribution of agricultural sector in economy development in Nigeria, it found that there was positive correlation between Gross Domestic Product with government spending in agricultural and direct foreign investment in agricultural sector.

Adeniyi and Bashir (2011) conducted a study about the impact of public investment toward the economy growth in Nigeria. They used time series data in 1970-2008, they found that government expenditure in agricultural sector, education sector, defensive sector and services sector statistically significant, while government expenditure in healthy sector, transportation sector, and telecommunication statistically were not significant.

Yudhoyono (2004), used econometric model with simultaneous equation system, the study concluded that fiscal policy plays important role in stimulating agricultural development, decreasing of poverty and rural economy. Agricultural revitalization could be energizer for economy growth in Indonesia.

Sudaryanto and Rusastra (2006) studied about policy strategies in increasing the agricultural productivity, they found that the ability of agricultural sector in increasing the production and decline of poverty depend on its ability to overcome the developing case they faced, such as the limitation of the developing irrigation, best variety technology, the availability of fund, and incentive system facilities to stimulate the increasing of productivity and farmer income.

The result of the study showed that fiscal policy gave positive impact in agricultural development. Therefore, the regencies and cities government in South Sulawesi Province in region autonomy era, is hope to take fiscal policy that can stimulate agricultural development, because mostly people work in agricultural sector in village with the minimum income.

Based on those descriptions, the study aims to know the impact of the region fiscal policy toward the agricultural development of regencies and cities in the South Sulawesi Province.

II. Data and Methodology

This study used *panel data* from 23 of regencies and cities in 2004-2009. Choosing of time range data in 2004-2009 is based on the region autonomy tends to stability and economic crisis is started in recovery. The data were used consists of regencies and cities fiscal from Financial Ministry of Republic of Indonesia and regencies and cities economic data such as regional gross domestic product, labor, unemployment, and poverty. The sources of data were taken from the Bureau of Statistics Central of Regencies and Cities in South Sulawesi Province.

This study used econometric model with simultaneous equation system. The model of simultaneous equation system that construct consists of 19 structural equations and 8 identity equations. These models were divided into three blocks namely (1) fiscal, (2) Aggregate demand, dan (3) economic performance.

Econometric model with simultaneous equations system was constructed as follows:

I. Fiscal Block

Regional Revenue

1. Original regional income

$$PAD_{it} = PAJD_{it} + RETD_{it} + BUMD_{it} + PADL_{it} \quad (1)$$

2. Regional tax

$$PAJD_{it} = a_0 + a_1 TPGPD_{it} + a_2 MTR_{it} + a_3 JKHL_{it} + a_4 LPAJD_{it} + u_1 \quad (2)$$

Parameter estimates of the expected: $a_1, a_2, a_3, a_4 > 0$

3. Regional Retribution

$$RETD_{it} = b_0 + b_1 PDRB_{it} + b_2 TPGPD_{it} + b_3 POP_{it} + b_4 LRETD_{it} + u_2 \quad (3)$$

Parameter estimates of the expected: $b_1, b_2, b_3, b_4 > 0$

4. General allocation funds

$$DAU_{it} = c_0 + c_1 PAD_{it} + c_2 LDK_{it} + c_3 MISK_{it} + c_4 POP_{it} + c_5 PNS_{it} + u_3 \quad (4)$$

Parameter estimates of the expected: $c_1, < 0$; $c_2, c_3, c_4, c_5 > 0$

5. Revenue-sharing

$$DBH_{it} = d_0 + d_1 PDRB_{it} + d_2 TREN_{it} + d_3 LDBH + u_4 \quad (5)$$

Parameter estimates of the expected: $d_1, d_2, d_3 > 0$

6. Total regional acceptance

$$TPD_{it} = PAD_{it} + DAU_{it} + DBH_{it} + DAK_{it} + PLD_{it} \quad (6)$$

Regional Revenue

1. Personnel expenditure

$$\text{BPGW}_{it} = e_0 + e_1\text{PNS}_{it} + e_2\text{PAD}_{it} + e_3\text{DAU}_{it} + e_4\text{LBPGW}_{it} + u_5 \quad (7)$$

Parameter estimates of the expected: $e_1, e_2, e_3, e_4 > 0$

2. Expenditures for goods and services

$$\text{BBJ}_{it} = f_0 + f_1\text{PAD}_{it} + f_2\text{DAU}_{it} + f_3\text{DBH}_{it} + f_4\text{LBBJ}_{it} + u_6 \quad (8)$$

Parameter estimates of the expected: $f_1, f_2, f_3, f_4 > 0$

3. Capital expenditure

$$\text{BMD}_{it} = \text{BMDSP}_{it} + \text{BMDSL}_{it} \quad (9)$$

4. Capital spending for agricultural sector

$$\text{BMDSP}_{it} = g_0 + g_1\text{DAK}_{it} + g_2\text{DAU}_{it} + g_3\text{LBMDSP}_{it} + u_7 \quad (10)$$

Parameter estimates of the expected: $g_1, g_2, g_3 > 0$

5. Capital spending for non agricultural sector

$$\text{BMDNP}_{it} = h_0 + h_1\text{DBH}_{it} + h_2\text{DAK}_{it} + h_3\text{LBMDNP}_{it} + u_8 \quad (11)$$

Parameter estimates of the expected: $h_1, h_2, h_3 > 0$

6. Government's miscellaneous expenditures

$$\text{BLL}_{it} = i_0 + i_1\text{DAU}_{it} + i_2\text{DBH}_{it} + i_3\text{PAD}_{it} + i_4\text{LBLL}_{it} + u_9 \quad (12)$$

Parameter estimates of the expected: $i_1, i_2, i_3, i_4 > 0$

7. Total regional government expenditure

$$\text{TPGPD}_{it} = \text{BPGW}_{it} + \text{BBJ}_{it} + \text{BMD}_{it} + \text{BLL}_{it} \quad (13)$$

II. Block of the Regional Aggregate Demand

1. Private consumption

$$\text{KONS}_{it} = j_0 + j_1\text{PDRB}_{it} + j_2\text{BBJ}_{it} + j_3\text{BPGW}_{it} + j_4\text{INFL}_{it} + j_5\text{LKONS}_{it} + u_{10} \quad (14)$$

Parameter estimates of the expected: $j_1, j_2, j_3, j_5 > 0; j_4 < 0$

2. Private investment

$$\text{INVS}_{it} = k_0 + k_1\text{BMD}_{it} + k_2\text{PAD}_{it} + k_3\text{KONS}_{it} + k_4\text{LINVSW}_{it} + u_{11} \quad (15)$$

Parameter estimates of the expected: $k_1, k_3, k_4 > 0; k_2 < 0$

3. Total government expenditure

$$\text{TPGP}_{it} = \text{TPGPD}_{it} + \text{DDTBL}_{it} \quad (16)$$

4. Regional export

$$\text{EXPD}_{it} = l_0 + l_1\text{NTRP}_{it} + l_2\text{PDRB}_{it} + l_3\text{INFL}_{it} + l_4\text{LEXPD}_{it} + u_{12} \quad (17)$$

Parameter estimates of the expected: $l_2, l_4 > 0; l_1, l_3 < 0$

5. Regional import

$$\text{IMPD}_{it} = m_0 + m_1\text{PDRB}_{it} + m_2\text{KONS}_{it} + m_3\text{LIMPD}_{it} + u_{13} \quad (18)$$

Parameter estimates of the expected: $m_1, m_2, m_3 > 0$

6. Net export

$$\text{NEXP} = \text{EXPD}_{it} - \text{IMPD}_{it} \quad (19)$$

III. Block Economic Performance

1. GDP from agricultural sector

$$\text{PDRBSP}_{it} = n_0 + n_1\text{PTKSP}_{it} + n_2\text{BMDSP}_{it} + n_3\text{LPDRBSP}_{it} + u_{14} \quad (20)$$

Parameter estimates of the expected: $n_1, n_2, n_3 > 0$

2. GDP from non agricultural sector

$$\text{PDRBNP}_{it} = o_0 + o_1\text{PTKNP}_{it} + o_2\text{INVS}_{it} + o_3\text{KONS}_{it} + o_4\text{LPDRBTB}_{it} + u_{15} \quad (21)$$

Parameter estimates of the expected: $o_1, o_2, o_3, o_4 > 0$

3. Regional gross domestic product

$$\text{PDRB}_{it} = \text{PDRBSP}_{it} + \text{PDRBNP}_{it} \quad (22)$$

4. Agricultural employment

$$\text{PTKSP}_{it} = p_0 + p_1\text{AKK}_{it} + p_2\text{BMDSP}_{it} + p_3\text{LPTKSP}_{it} + u_{23} \quad (23)$$

Parameter estimates of the expected: $p_1, p_2, p_3 > 0$

5. Non-agricultural employment

$$PTKNP_{it} = q_0 + q_1 INVS_{it} + q_2 AKK_{it} + q_3 LPTKNP_{it} + u_{24} \tag{24}$$

Parameter estimates of the expected: $q_1, q_2, q_3 > 0$

6. Employment

$$PTK_{it} = PTKSP_{it} + PTKNP \tag{25}$$

7. Unemployment

$$UNEP_{it} = r_0 + r_1 AKK_{it} + r_2 BMD_{it} + r_3 LUNEP_{it} + u_{25} \tag{26}$$

Parameter estimates of the expected: $r_1, r_3 > 0; r_2 < 0$

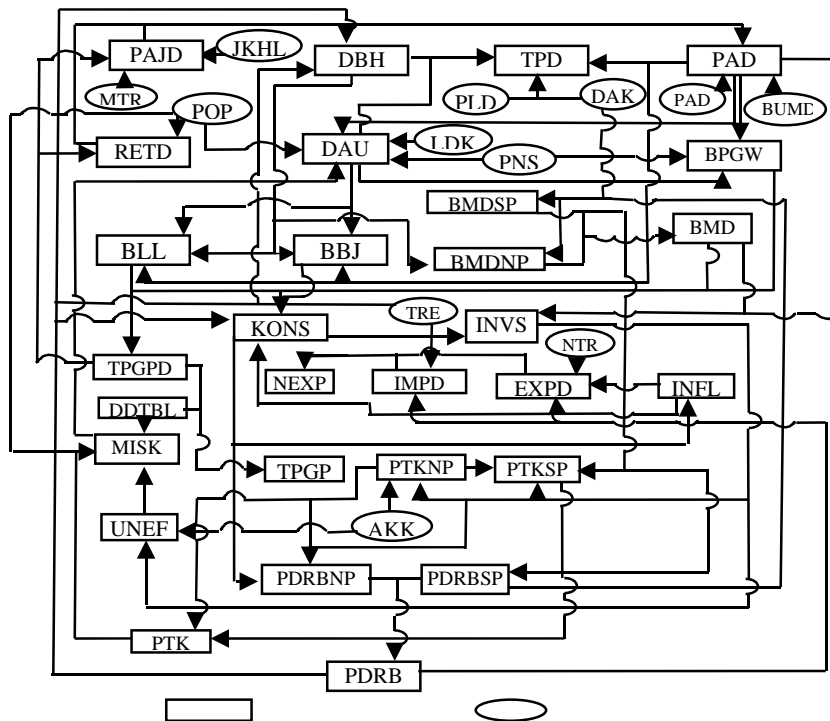
8. Number of the poor

$$MISK_{it} = s_0 + s_1 PDRB_{it} + s_2 POP_{it} + s_3 PTK_{it} + s_4 DDTBL_{it} + s_5 LMISK_{it} + u_{26} \tag{27}$$

Parameter estimates of the expected: $s_2, s_5 > 0; s_1, s_3, s_4 < 0$

The interrelatedness among the variables in the model can be seen in Figure 1.

Figure 1: The Interrelatedness among the Variables of Fiscal Performance Model of the Regencies a Cities in South Sulawesi Province



Note: Endogenous Variable Exogenous Variable

III. Empirical Results

The specification model used in this study had modified in several times, because it is found that some estimations result were not consistent to the theory of some parameter estimations were not real. Finally, this study found the model with result performance parameters estimation that enough representative to describe the phenomenon that exists in regencies and cities of south Sulawesi province.

The result of estimation model by using econometric method 2 SLS (Two Least Square) the factors influenced the endogenous variables in the model were obtained, where there were 27 structural equations consist of three blocks as a whole showed good results.

Fiscal Policy

The result of the estimations model on regional fiscal revenues (Appendix 2) showed that: (1) Regional taxes were significantly and positively influenced by the number of hotel rooms and the regional taxes

of the previous year. Meanwhile, the number of vehicles and the total government spendings had a positive sign, but they did not significantly affect the regional tax revenues. (2) Regional retribution were positively and significantly influenced by the total regional government expenditure and the Regional Retribution of the previous year, while GDP and the population number had a positive sign but no significant effect on revenue from the Regional Retribution. (3) general allocation fund (DAU) was significantly and positively affected by the number of civil servants, the size of regency area, and the number of poverty. (4) Sharing revenue Fund (DBH) was significantly and positively influenced by GDP and the sharing revenue from the previous year.

Based the results of estimations model on regional fiscal expenditure showed that: (1) civil servants' expenditures were significantly and positively influenced by the number of civil servants, regional revenues and expenditures of the previous year; (2) expenditures for goods and services were positively and significantly affected by the regional revenue and expenditures for goods and services of the previous year, while sharing revenue and general allocation fund had a positive sign, but they did not significantly affect the expenditure of goods and services; (3) the capital spending of agricultural sector was significantly influenced by the agricultural GDP and the capital expenditure of agricultural sector of the previous year, while general allocation fund and special allocation fund did not have a significant impact on the capital spending of agricultural sector; (4) the capital spending of other sectors was significantly and positively influenced by the special allocation of funds, sharing revenue and capital expenditures in other sectors of the previous year; and (5) other expenditures of regional government was only affected significantly by other spending of the previous year, while the general allocation, sharing revenue, and revenue had a positive sign but did not significantly affect other expenditures of the regional government.

Aggregate Demand

Based on the results of the estimation model of aggregate demand (Appendix 3), showed that: (1) Consumption was significantly influenced by the regional gross domestic product (GDP) and public consumption of the previous year. The study showed that if GDP and public consumption increase in the previous year, the consumption will also increase in the current year; (2) Private investment was significantly and positively influenced by public consumption and investment of the previous year, but on the other hand the private investment was significantly and negatively influenced by GDP. However, if the consumption and investment increased in the previous year, the current year's investment will also increase, whereas if PAD increases, the private investment will decline. This indicated that the taxes and regional retribution as the main source of revenues collected by the regional governments were high cost economy; (3) Regional exports were not only significantly and positively affected by GDP and the exports of the previous year, but also by the exchange rate of rupiah. So if GDP and the exports of the previous year increase, the current year's exports will also increase. Conversely, when the exchange rate increases, the region exports will decrease; (4) Regional import was significantly affected by the import of the previous year, while other variables such as GDP, consumption, and trend did not significantly affect the regional import.

Economic Performance

The result of estimation model in regional output (Appendix 4) showed that regional gross domestic product in agricultural sector was only influenced significantly and positively by regional gross domestic product in agricultural sector in the previous year, while the labor absorption in agricultural sector and capital spending of the agricultural sector positively influenced but not significant. Then, non agricultural regional gross domestic product was significantly influenced by private investment and non agricultural sector regional gross product of the previous year, while the labor absorption in non agricultural sector and consumption positively influenced but not significant.

The results of estimation model of labor absorption in agricultural sector and non agricultural sector indicated that labor absorption in agricultural sector was significantly and positively influenced

by a number labor rate and labor absorption in agricultural sector of the previous year, on the other side, labor absorption in non agricultural sector negatively and significantly influenced to the labor absorption in agricultural sector. Then, labor absorption in non agricultural sector was significantly and positively influenced by private investment, employment rate and labor absorption in non agricultural sector of the previous year.

The results of estimation model of unemployment showed that unemployment was significantly and positively influenced by the unemployment in the previous year, meanwhile, capital spending had a negative and significant influenced to the unemployment. This showed that if the unemployment increases in the previous year, the unemployment rate in current year's increased, on the other hand, if the capital spending is increased, the unemployment rate will decrease.

The results of estimation model to the poverty were significantly and positively influenced by the number of population and poverty of the previous year. While, labor absorption influenced negatively and significantly to the poverty. Then, regional gross domestic product and deconcentration fund and assistance task had a negative influenced but not significant.

The Policy Simulation

The policy simulations carried out in this study were categorized into three groups (Table 1): (1) policy simulation aimed to increase the original regional income variables, (2) policy simulation aimed to increase fiscal transfer from central government such as general allocation fund, sharing fund, and specific allocation fund, and (3) policy simulation aimed to reallocate the government spending by means to increase the capital spending.

Table 1: The Results of Simulation of Fiscal Policies toward the Agricultural Development of the Regencies' and Cities' Economy of South Sulawesi Province

Name of variables	Basic Values	S1	S2	S3	S4	S5	S6	S7
		Δ	Δ	Δ	Δ	Δ	Δ	Δ
		%	%	%	%	%	%	%
Private consumption	987212	0,01	0	0,01	0,01	0,01	-0,02	0,01
Private investment	333527	-0,22	-0,42	0,66	0,66	1,43	1,34	0,27
Regional export	808195	0,01	0,01	0,02	0,02	0,02	0,04	0,04
Regional import	630929	0	0	0	0	0	0,01	0,01
GDP from agricultural sector	535528	0,04	0,04	0,09	0,09	0,09	0,18	0,27
GDP from non agricultural sector	1221898	0,02	0,02	0,06	0,06	0,07	0,09	0,04
Agricultural employment	67197,1	0,02	-0,03	-0,05	-0,05	-0,11	-0,1	0,02
Non-agricultural employment	59986,7	-0,02	0,04	0,06	0,06	0,14	0,13	0,03
Unemployment	13925,6	-0,70	-0,69	-1,40	-1,40	-2,58	-2,8	-0,56
Number of the poor	45125,1	-0,01	-0,01	-0,02	-0,02	-0,02	-0,04	-0,02
Regional gross domestic product	1757426	0,03	0,03	0,07	0,07	0,07	0,12	0,11
Farmers' income	7,97	0,03	0,08	0,14	0,14	0,20	0,28	0,29

Note:

1. Increasing local taxes 10 percent and increasing capital spending of agricultural and non agricultural 2,5 percent
2. Increasing local taxes and regional retribution 10 percent, and increased capital spending of agricultural and non agricultural 5 percent.
3. Increasing general allocation fund 5 percent and increasing capital spending of agricultural and non agricultural 10 percent.
4. Increasing the sharing fund and specific allocation fund 10 percent and increasing capital spending of agricultural and non agricultural 10 percent.
5. Decrising other expenditures 20 percent and increasing capital spending in agricultural and non agricultural sectors 10 percent.
6. Decrising other expenditures 20 percent and goods and services expenditures 10 and increasing capital spending in agricultural and non agricultural sectors 20 percent.
7. Decrising other expenditures 10 percent and increasing capital spending in agricultural sectors 30 percent.

The results of policies simulations aimed to increase original regional revenue variables (simulations 1 and 2) obtained that, if the local government strive to get regional and tax potentiality to increase the original regional revenues by means to increase the capital spending, had a very small impact to the regional gross domestic product growth of the agricultural sector and non agricultural sector, this is caused by declining of private investment. That is why, were not worth considering in policy making, because they could cause a high cost economy.

The result of the simulation policy aimed to increase fund transfer variable from central government (simulations 3 and 4), obtained that, if the central government increased the transfer fund for the local government by mean in order that local government can increase the capital spending, could stimulate private investment, increased the regional gross domestic product from both agricultural and non agricultural sector, decreased the labor absorption of the agricultural sector and increased the labor absorption of the non agricultural sector, so it can increase the farmer revenues and also can decline unemployment and poverty rate.

Fiscal policy simulations intended to reallocate the government spending in order to increase the capital spending in both agricultural and non agricultural sectors, by reducing spending on other goods and services (simulation 6.7 and 8) were considered more effective in promoting economic growth, reducing unemployment and poverty in the regencies and cities of South Sulawesi Province, if it is compared to the policy simulation to increase original regional revenues variable and increasing transfer fund from central government.

IV. Conclusions and Policy Implications

The result of this study found that fiscal policy implemented by regional governments, particularly capital spending on agricultural sectors could increase regional gross domestic product on agricultural sector and farmer income. The capital spending of non agricultural sector could encourage private investment. Then, private investment could encourage the increasing of regional gross domestic product on non agricultural. On one side, private investment could decrease unemployment rate. On the other hand, the poverty could be decreased by increasing regional gross domestic product. On the other hand, fiscal policy by mean to increase original regional revenues could reduce the private investment. This is showed that if local government forced to explore the potential of regional retribution and taxes, can impact on high cost economy that affect the declining of investment.

The result of simulation showed that the reallocation of budget by reducing other spending and expenditures of goods and services, then, is used to increase the capital spending to give good results in encouraging the agricultural and non agricultural sector growth, reducing unemployment and poverty, comparing policy simulation to increase original regional income and transfer fund from central government.

Policy Implications

The limitation of Regional Budget, it is necessary to be efficient in the budget spending, especially on other spendings, and spending for goods and services, then, it is used to increase capital spending to improve the existing infrastructure, in order to attract the investors to invest their capital.

Capital spending of agricultural sector is particular factor in encouraging regional gross domestic product in agricultural sector and former income. Therefore, local government is very important to take part in developing agricultural sector and increasing the farmer income, because most the regencies and cities population work in agricultural sector with smaller scale in rural area.

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Appendix 1. Variable Name, Symbol, and Unit

NAME OF VARIABLES	SYMBOLS	UNIT
Labor force	AKK	People
Expenditures for goods and services	BBJ	Million rupiah
Government's miscellaneous expenditures	BLL	Million rupiah
Capital expenditure	BMD	Million rupiah
Capital spending for non agricultural sector	BMDNP	Million rupiah
Capital spending for agricultural sector	BMDSP	Million rupiah
Personnel expenditure	BPGW	Million rupiah
Regional government-owned enterprises	BUMD	Million rupiah
Special allocation funds	DAK	Million rupiah
General allocation funds	DAU	Million rupiah
Revenue-sharing	DBH	Million rupiah
Deconcentration, assisiting task, etc.	DDTBL	Million rupiah
Regional export	EXPD	Million rupiah
Regional import	IMPD	Million rupiah
Regional inflation	INFL	Percent
Private investment	INVS	Million rupiah
Number of hotel rooms	JMKH	Unit
Private consumption	KONS	Million rupiah
Eexpenditures for goods and services in the previous year	LBBJ	Million rupiah
Government's miscellaneous expenditures in the previous year	LBLL	Million rupiah
Capital expenditure for agricultural sector in the previous year	LBMDSP	Million rupiah

Capital expenditure for other sectors in the previous year	LBMDNP	Million rupiah
Personnel expenditure in the previous year	LBPGW	Million rupiah
The area of the regency/city	LDK	Km2
Revenue-sharing in previous year	LDBH	Million rupiah
Regional export in the previous year	LEXP	Million rupiah
Regional Import in the previous year	LIMPD	Million rupiah
Private investment in the previous year	LINVS	Million rupiah
Private consumption in the previous year	LKONS	Million rupiah
Number of the poor in the previous year	LMISK	People
Regional taxes in the previous year	LPAJD	Million rupiah
GDP in the previous year	LPDRB	Million rupiah
GDP from agricultural sector in the previous year	LPDRBSP	Million rupiah
GDP from non agricultural sector in the previous year	LPDRBNP	Million rupiah
Non-agricultural employment in the previous year	LPTKNP	People
Agricultural employment in the previous year	LPTKSP	People
Income from regional retribution in previous year	LRETD	Million rupiah
Unemployment in the previous year	LUNEP	People
Number of the poor	MISK	People
Number of motor vehicles	MTR	Unit
Rupiah exchange rate	NTRP	Million rupiah
Net exports	NEXP	Million rupiah
Original regional income	PAD	Million rupiah
Other regional revenues	PADL	Million rupiah
Regional tax	PAJD	Million rupiah
Regional gross domestic product	PDRB	Million rupiah
GDP from agricultural sector	PDRBSP	Million rupiah
GDP from non agricultural sector	PDRBNP	Million rupiah
Other regional revenues	PLD	Million rupiah
Number of civil servants	PNS	People
Number of population	POP	People
Employment	PTK	People
Non-agricultural employment	PTKNP	People
Agricultural employment	PTKSP	People
Regional Retribution	RETD	Million rupiah
Total regional revenue	TPD	Million rupiah
Total government expenditure	TPGP	Million rupiah
Total regional government expenditure	TPGPD	Million rupiah
Trends (years 1,2,3, ... n)	TREN	1,2,3....n
Provincial minimum wage	UMP	Rupiah
Unemployment	UNEP	People

Appendix 2. Parameter Estimation Results of Equation Local Fiscal

Equation Regional Tax (PAJD)						
Variable s	Estimation	Prob>[T]	Elasticity	Name of variables	F-Value	R ²
Intercept	-895.2	0.1040	-	Intercept		
TPGPD	0.0036	0.2348	0.1907	Total regional government expenditure	832.09	0.9604
MTR	0.001	0.7911	0.0143	Number of motor vehicles		
JMKH	1.69777	0.0011	0.1730	Number of hotel rooms		
LPAJD	0.85192	<.0001	-	Regional taxes in the previous year		
Equation Regional Retribution (RETD)						
Intercept	-536.323	0.1958	-	Intercept		
PDRB	0.00003	0.7299	0.0142	Regional gross domestic product		
TPGPD	0.0069	0.0251	0.3636	Total regional government expenditure	299.40	0.8970
POP	-0.00002	0.9838	-0.0017	Number of population		
LRETD	0.83131	<.0001	-	Regional Retribution in previous year		
Equation General allocation funds (DAU)						
Intercept	53304.24	<.0001	-	Intercept		
PAD	-0.28029	0.1762	-0.0259	Original regional income	306.86	0.9175
LDK	0.4559	0.4741	0.0066	The area of the regency/city		
MISK	0.110772	0.0946	0.0366	Number of the poor		

POP	0.067244	0.0003	0.1637	Number of population		
PNS	10.17243	<.0001	0.4291	Number of civil servants		
Equation Revenue-sharing (DBH)						
Intercept	2756.456	0.0150	-	Intercept		
PDRB	0.0007	0.0286	0.0701	Regional gross domestic product	241.81	0.8406
TREN	2.3732	0.9153	0.0005	Trends (1.2.3., ...,n)		
LDBH	0.8137	<.0001	-	Revenue-sharing in previous year		
Equation Personnel expenditure (BPGW)						
Intercept	-3117.36	0.4952	-	Intercept		
PNS	3.89653	0.0233	0.2276	Number of civil servants		
PAD	0.323036	0.0133	0.0414	Original regional income	588,76	0.9444
DAU	0.174508	0.0292	0.2420	General allocation funds		
LBPGW	0.548494	<.0001	-	Personnel expenditure in the previous year		
Equation Expenditures for goods and services (BBJ)						
Intercept	215.3115	0.9280	-	Intercept		
PAD	0.243074	0.0187	0.1059	Original regional income		
DAU	0.041144	0.0438	0.1940	General allocation funds	238.20	0.8738
DBH	0.093203	0.2660	0.0564	Revenue-sharing		
LBBJ	0.723246	<.0001	-	Expenditures for goods and services in the previous year		
Equation Capital spending for agricultural sector (BMDSP)						
Intercept	3215.575	<.0001	-	Intercept		
DAK	0.025847	0.3520	0.0567	Special allocation funds		
PDRBSP	0.001373	0.0338	0.0975	GDP from agricultural sector	23.37	0.32882
LBMDSP	0.432886	<.0001	-	Capital spending for agricultural sector in the previous year		
Equation Capital spending for non agricultural sector (BMDNP)						
Intercept	-8016.31	0.0692	-	Intercept		
DBH	0.613073	<.0001	0.2207	Revenue-sharing		
DAK	1.369996	<.0001	0.4655	Special allocation funds	86.07	0.65069
LBMDSL	0.537574	<.0001	-	Capital spending for non agricultural sector in the previous year		
Equation Government's miscellaneous expenditures (BLL)						
Intercept	1998.622	0.4750	-	Intercept		
DAU	0.02877	0.2305	0.2070	General allocation funds		
DBH	0.13045	0.1783	0.1206	Revenue-sharing	34.24	0.49250
PAD	0.03654	0.7395	0.0243	Original regional income		
LBLL	0.51986	<.0001	-	Government's miscellaneous expenditures in the previous year		

Appendix 3. Parameter Estimation Results of the Regional Aggregate Demand Equation

Equation Private consumption (KONS)						
Variables	Estimation	Prob> T	Elasticity	Name of Variables	F-Value	R ²
Intercept	-53273.7	0.0508	-	Intercept		
PDRB	0.034416	0.0556	0.0615	Regional gross domestic product		
BBJ	0.113473	0.8969	0.0033	Expenditures for goods and services	7500,34	0.99636
BPGW	0.297545	0.3536	0.0297	Personnel expenditure		
INFL	26.27078	0.2287	0.0205	Regional inflation		
LKONS	0.99252	<.0001	-	Private consumption in the previous year		
Equation Private investment (INVS)						
Intercept	-59462.4	0.0120	-	Intercept		
BMD	0.434145	0.2724	0.0732	Capital expenditure		
PAD	-4.02862	0.0663	-0.152	Original regional income	1580.57	0.97878
KONS	0.154228	0.0004	0.4566	Private consumption		
LINVS	0.8802	<.0001	-	Private investment in the previous year		

Equation Regional export (EXPD)						
Intercept	734289	0.0127	-	Intercept		
NTRP	-93.3617	0.0068	-1.1132	Rupiah exchange rate		
PDRB	0.152785	<.0001	0.3333	Regional gross domestic product	5276.89	0.99355
INFL	49.19232	0.4554	0.0476	Regional inflation		
LEXPD	0.887439	<.0001	-	Regional export in the previous year		
Equation Regional import (IMPD)						
Intercept	-28865.7	0.2987	-	Intercept		
PDRB	0.020732	0.4749	0.0580	Regional gross domestic product	7360,77	0.99383
KONS	0.003871	0.9559	0.0061	Private consumption		
LIMPD	1.059737	<.0001	-	Regional import in the previous year		

Appendix 4. Parameter Estimation Results for Economic Performance Equation

Equation GDP from agricultural sector (PDRBSP)						
Variables	Estimation	Prob> T	Elasticity	Name of Variables	F-Value	R ²
Intercept	-3138.32	0.6844	-	Intercept		
PTKSP	0.013312	0.8495	0.0017	Agricultural employment		
BMDSP	0.635525	0.5853	0.0089	Capital spending for agricultural sector	6445.14	0.9958
LPDRBS P	1.034369	<.0001		GDP from agricultural sector in the previous year		
Equation GDP from non agricultural sector (PDRBNP)						
Intercept	-20573.3	0.0353	-	Intercept		
PTKNP	0.152716	0.5415	0.0075	Non-agricultural employment		
INVS	0.167825	<.0001	0.0455	Private investment	60319	0.9994
KONS	0.034157	0.2182	0.0274	Private consumption		
LPDRBN P	1.00702	<.0001		GDP from non agricultural sector in the previous year		
Persamaan absorption Tenaga Kerja Sektor Pertanian (PTKSP)						
Intercept	-1419.73	0.0837	-	Intercept		
AKK	0.743569	<.0001	1.5617	Labor force		
INVS	-0.00003	0.9865	-0.0002	Private investment	1313.13	0.9891
PTKNP	-0.86324	<.0001	-0.7706	Non-agricultural employment		
LPTKSP	0.232496	0.0006		Agricultural employment in the previous year		
Equation Non-agricultural employment (PTKNP)						
Intercept	-586.93	0.6865	-	Intercept		
INVS	0.01749	<.0001	0.0973	Private investment	5205.46	0.9913
AKK	0.05085	0.0011	0.1196	Labor force		
LPTKNP	0.84106	<.0001		Non-agricultural employment in the previous year		
Equation Unemployment (UNEP)						
Intercept	660.4631	0.0669	-	Intercept		
AKK	0.045698	0.3627	0.4631	Labor force		
BMD	-0.03462	<.0001	-0.1399	Capital spending	101856	0.9997
LUNEP	0.651315	<.0001		Equation Unemployment in the previous year		
Equation Number of the poor (MISK)						
Intercept	725.262	0.4467	-	Intercept		
PDRB	-0.00027	0.5764	-0.0106	Regional gross domestic product		
POP	0.03295	0.0269	0.2428	Number of population	1077.97	0.9692
PTK	-0.07631	0.0162	-0.2151	Employment		
DDTBL	-0.00117	0.8107	-0.0016	Deconcentration. assissting task, etc		
LMISK	0.949714	<.0001		Number of the poor in the previous year		