

# LOCAL GOVERNMENT EXPENDITURES AND ECONOMIC GROWTH IN A NEW AUTONOMOUS IN INDONESIA

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## ABSTRACT

*This research aims to find out the pattern of local government expenditures, especially regional expenditures directly related to economic growth, namely regional expenditures in education, health, agriculture, housing, transportation, and social, and linking the respective superior sectors in the New Autonomous Region (NAR) In Sumatera Island. The result of study shows that potential sectors having criteria of the basic sector, and high growth and competitiveness are still dominated by the agricultural sector and services. Meanwhile, local government expenditures for education, health, and social affairs have a positive and significant effect, housing has a negative and significant effect, and government spending on agriculture and transportation has no significant effect on the growth of the new autonomous regions, with the agricultural sector, Manufacturing, electricity, gas and water supply sectors, construction sector, trade, hotel and restaurant sector, as well as transportation and communications sectors being the ones supporting economic development in New Autonomous Regions (NAR).*

**Keywords:** Government Expenditure, Government Spending, Economic Growth, Potential Sectors.

## INTRODUCTION

Government plays important roles in the economic development; allocation, distribution, and stabilization. Government conducts development activity through expenditure to encourage the economic movement, vital service public infrastructure development (Musgrave and Musgrave, 1991). By using fiscal policy instrument, local government serves public and builds economic growth through the Local Income and Expenditure Budget (APBD).

The effect of local government expenditure on a region's economic growth can be measured using GDP, a total sum of value added resulting from economic activity. GDP can be a parameter for the government and other parties to evaluate the successful economic development, and can be used to find out the local economic development wholly or per sector. Samuelson and Nordhaus (2005) pointed out four factors determines economic development that are human resource, natural resource, capitalization, and technology.

Musgrave and Musgrave (1976) mapped three stage of government expenditure evolution to economic development; beginning, intermediate and advanced stages. At the beginning stage, the ratio of government investment to total investment is relatively large. The government provides investment in the field of education, health, and transportation infrastructures. At the intermediate level, government investment is still remains to improve economic growth to take off by providing larger portion to the private investment. In a development process, the ratio of

private investment to GDP is getting larger and the ratio of government investment to GDP will be smaller (Musgrave, 1980).

In advanced stage, the activity in economic development shifts from infrastructure provision to expenditure for social activities such as old age security program and public health service (Akpan, 2005). Folster and Henrekson (1999), Laudau (1983), and Dandan (2011) negated effect of government expenditure on economic growth is negative. Contradictory to them, Korman and Brahmasrene (2007), Donald and Shuaglin (1983) see positive and significant impact of government expenditure to economic growth.

Harshorn (1995), Saad and Kalakech (2009); Loto (2011) used expenditure components defense, education, health, transportation and communication, and agriculture to study the effect of government expenditure on economic growth using. Loto (2011) specifically monitor health and education sectors to improve labor efficiency and its impact to improve national production growth. In short term, expenditure in agriculture and education affects negatively the economic growth and that in health, transportation and communication as well as security affects positively. While that in national security transportation and communication is not significant statistically.

Lin (1994) points out that government expenditure impact to the improvement economic growth through public commodity and infrastructure, social service and intervention target. In line with Kweka and Morrissey (2000), by adding government transfer, consumption and total output variables find the three components have negative effect, while education expenditure has positive effect, and government investment does not affect the private productivity growth. The result of Zodik (2006) study shows that the government expenditure, both development and routine expenditures, affects the regional economic growth.

Local autonomy generates region expansion in many Indonesian areas since the enactment of Law No. 22 and 25 of 1999, the establishment of New Autonomous Region 217 NARs; 8 provinces, 174 regencies and 34 municipalities effect to the economic growth.

Tiebout (1956) area expansion has a power to maintain low tax rate, to provide efficient service, and to allow its individual members of society to express their opinion on any type of services from different government level with vote their feet.

The main rationale of expansion area is the need for distribution local economy, broad geographical condition and easy process of delivering public service. Sumatera Island as one of economic corridor areas in MP3EI program has 17 New Autonomous Regions (Regencies/Municipals). The question is do these 17 New Autonomous Regions have exerted positive effect on development acceleration indicated by economic growth and wellbeing improvement of the people. Thus, this study aims to identify potential sectors in each of NARs to accelerate economic growth, to analyse the effect of government expenditure in education, health, agriculture, housing, communication, and social sectors on economic growth of regencies/municipals in Sumatera.

## LITERATURE REVIEW

### Economic Growth Theory

Economic growth is the long-term output rise process, measured with indicator of real GDP development over years. Economic growth can originate from Aggregate Demand (AD) and or Aggregate Supply (AS) aspects. From AD aspect, the shift of curve to the right reflects on the increased demand in economy. Meanwhile, from AS aspect, economic growth can be seen

from production aspect. Neo-classic group focuses their attention on the positive effect of capital accumulation (physical investment) on economic growth, and the role of technology on output growth does not get explicit attention.

The slow economic growth in developing countries is due to the society's low demand for product and service (Todaro and Smith, 2003). Low income of the people is due to low labor productivity reflected the low quality of human resource as the most determinant factor (Schultz (1961).

Solow and Swan (1956) regard population growth, capital accumulation, technology advance, and output size interact each other. Production function allows for the substitution of Labour (L) for Capital (C). Growth level derives from capital accumulation, increased labour offering, and technology advance. Skill improvement and technique advance improves productivity. Solow-Swan theory sees market mechanism can create equilibrium. To them, it is unnecessary for the government to influence the market mechanism too much except in fiscal and monetary policies. Four important variables in Solow-Swan's model are output, capital, labour, and knowledge, as formulated below:

$$Y(t)=F [ K(t), L(t), A(t) ] \dots\dots\dots(1)$$

Solow's model growth theory was designed to shows how capital supply growth, labor growth, and technology advance interact in economy and their effect are on a state's product and service output overall (A/A) (Mankiw, 2003).

### **Government Expenditure Theory**

Adolf Wagner states that in an economy, when per capita income increases, government expenditure will increase relatively. Thus, government should organize the relationship emerging in society, law, education, recreation, culture, and etc. Peacock and Wiseman's Theory which analyzes government expenditure revenue stated that government tried to increase its expenditure by relying on increasing the tax revenue. Harry W. Richardson (1973) argued that the main determinant of an economic growth is related directly to product and service from outside region (Arsyad, 1999). It underlies location quotient technique thinking, the one helping determine local economic export capacity and self-sufficiency level of a sector.

Glasson in Ghalib (2005) says that the basic concept of economic base divided into two sectors. Firstly, base Sector focuses on the activity of exporting products and services to outside its economic area or marketing products out of its economic area border. Secondly, non-base sector activity that provides products and services for the need of people living in its own economic area without exporting products or service to outside area.

One of important indicators to find out economic condition in an area/province in a certain period is Gross Regional Domestic Product (GRDP) data, both by prevailing price or constant price. GRDP, according to Central Statistical Bureau (2007: 2), is the amount of added value yielded for entire business area in a region or the amount of total final product and service value yielded by all economic units in a region.

### **Research Hypothesis**

The hypotheses proposed in this study are:

*H1: Local government expenditure in education sector affects economic growth positively.*

*H2: Local government expenditure in health sector affects economic growth positively.*

*H3: Local government expenditure in agricultural sector affects economic growth positively.*

*H4: Local government expenditure in housing sector affects economic growth positively.*

*H5: Local government expenditure in transportation/communication sector affects economic growth positively.*

*H6: Local government expenditure in social sector affects economic growth positively.*

*H7: Economic development in Sumatera Regions is different between the region with base and the one with non-base economic sectors.*

## METHOD

### Sample

1. Purposive sampling employed with the certain criteria.
2. Regency/city expanded in 1999 in Sumatera Island.
3. New autonomous regions (Regencies/Municipals) not expanded two times.
4. New autonomous regions (Regencies/Municipals) with reign period of more than 10 years (2 reign periods).

Considering this, the sample of research consisted of 17 regencies/municipals in Sumatera.

### Analysis Model

The study applied qualitative and quantitative through economic base approach with Klassen's typology analysis instruments to prioritize sector, sub sector, business, or commodity of a region and to find out the description a region's economic growth pattern and structure. Besides, Location Quotient, a method of calculating the ratio of the relative contribution of a sector's added value in a region (Regency/Municipal) to the contribution of corresponding sector's added value at province or national scale is also applied in this study.

Considering the result of LQ calculation, the analysis can be drawn if LQ is more than one ( $LQ > 1$ ) is a potentially export base sector, it means that the Regency/municipal's specialization is higher than that in province level; if LQ is less than one ( $LQ < 1$ ) is a non-base sector, the one with specialization level lower than that at province level; if LQ is equal to one ( $LQ = 1$ ), it means that the specialization of Regency/Municipal is as same as that of province level (Table 1).

Potential Sector	LQ	Pr	Dr	Meaning
1	B	+	+	Base sector has rapider growth and higher comparative advantage than the one does at province level.
2	B	-	+	Base sector has slower growth but higher comparative advantage than the one does at province level.
3	B	+	-	Base sector has rapider growth but lower comparative advantage than the one does at province level.
4	B	-	-	Base sector has slower growth and lower comparative advantage than the one does at province level.
5	NB	+	+	Non-base sector has rapider growth and higher comparative advantage than the one does at province level.
6	NB	-	+	Non-base sector has slower growth but higher comparative advantage than the

<b>Table 1</b>				
<b>POTENTIAL SECTOR RANKING</b>				
				one does at province level.
7	NB	+	-	Non-base sector has rapider growth but lower comparative advantage than the one does at province level.
8	NB	-	-	Non-base sector has slower growth and lower comparative advantage than the one does at province level.

Shift Share analysis was also used to analyze and to find out the shift and the role of local economy. It used to observe economic structure and its shift by means of emphasizing on sector growth in region, compared with the same sector in higher region level or at national level. Local economy dominated by the slowly growing sector will grow below the economic growth level of higher region.

The potential economic sector in this research was analyzed using overlay from Klassen's typology, Location Quotient (LQ) and Shift Share analyses, by considering typology of New Autonomous Region, base and non-base sectors, and the sector with growth and competitiveness (comparative advantages) in the same sector to the province with the following alternative:

### **Descriptive Analysis**

Descriptive analysis method is the simple one that can be used to describe an observation's condition by presenting in table, chart and narration aiming to make the readers interpret the result of observation more easily.

### **Econometric Analysis**

This research employed econometric analysis method, panel data (pooled data) regression. Panel data is the combination of time series and cross sectional data. Currently panel data method has been used widely as some weaknesses are found in either cross sectional or time series approach.

The same cross sectional data is observed by time; if each of cross sectional units has the same time series observation, it is called balanced panel, and otherwise when the number of observations is different, it is called unbalance panel.

Baltagi (2005) suggests some advantages of panel data collection in econometric analysis, one of which is controlling individual heterogeneity. Panel data states that individuals, companies, places or states are heterogeneous. In panel data, there are size and time, so that there are other variables likely becoming state-invariant or time-invariant that can affect dependent variable. Panel data gives treatment opportunity to each of heterogeneous individual units analyzed.

### **Research Model Formulation**

To analyze the effect of government expenditure on economic growth in New Autonomous Regions (Regencies/Municipals) using regression analysis. The advantage of local autonomy in the sense of public service improvement is reflected on government expenditure in education, health, and infrastructure areas with proxy that government expenditure in public work, in housing, in transportation/telecommunication, and in social areas, added with dummy

variable of Regency/Municipal and dense basic economic sector encourage the economic growth. This model estimated in this research is:

$$Y=f(PEND, KES, PERT, PERUM, TRANS, SOSIAL, DLQ>1(sector_i)).....(1)$$

From equation 1, the following is obtained:

$$E_G=f(PEND^{\alpha_1} KES^{\alpha_2} PERT^{\alpha_3} PERUM^{\alpha_4} TRASN^{\alpha_5} SOSIAL^{\alpha_6} DLQ>1(sector_i)^\beta .....(2)$$

Using an empirical linear model, equation 1 is derived using  $\ln$  (*natural logarithm*) so that the regression equation is written as follows:

$$\ln E_{G_{it}} = \alpha_0 + \alpha_1 \ln PEND_{it} + \alpha_2 \ln KES_{it} + \alpha_3 \ln PERT_{it} + \alpha_4 \ln PERUM_{it} + \alpha_5 \ln TRANS_{it} + \alpha_6 \ln SOSIAL_{it} + \beta_2 D_{2i} + \beta_3 D_{3i} + \beta_4 D_{4i} + \beta_5 D_{5i} + \beta_6 D_{6i} + \beta_7 D_{7i} + \beta_8 D_{8i} + \beta_9 D_{9i} + \varepsilon_t .....(3)$$

Where:

$\ln E_{G_{it}}$ =Economic growth

PEN=Education Sector Expenditure

KES=Health Sector Expenditure

PERT=Agricultural Sector Expenditure

PERUM=Housing Sector Expenditure

TRANS=Transportation/Telecommunication Sector Expenditure

SOSIAL=Social Sector Expenditure

D1=LQ Agricultural Sector; 1 when LQ>1 and 0 others

D2=LQ Mining and Exploration Sector; 1 when LQ>1 and 0 others

D3=LQ Processing Industry Sector; 1 when LQ>1 and 0 others

D4=LQ Electricity, Gas and Clean Water; 1 when LQ>1 and 0 others

D5=LQ Building Sector; 1 when LQ>1 and 0 others

D6=LQ Trading, Hotel and Restaurant Sector; 1 when LQ>1 and 0 others

D7=LQ Transportation and Communication Sector; 1 when LQ>1 and 0 others

D8=LQ Financial, Lease & Company Service Sector; 1 when LQ>1 and 0 others

D9=LQ Services Sector; 1 when LQ>1 and 0 others;  $\alpha_0$ =Intercept (constant);  $\varepsilon_t$ =error term

## RESULT AND DISCUSSION

To see economic growth pattern and structure in New Autonomous Region, local typology analysis can be used. This analysis builds on two main indicators: local economic growth and income or per capita local GDP, by determining economic growth as vertical axis and per capita GDP as horizontal axis. In this research, the items becoming reference are economic growth and per capita income of Sumatera region. The New Autonomous Regions observed are classified into four groups: 1<sup>st</sup> quadrant includes New Autonomous Region with high growth and high income, the one with economic growth and per capita income higher than the average for Sumatera area; 2<sup>nd</sup> quadrant is New Autonomous Region with high income but low growth, the one with high per capita income but lower economic growth compared with the average for Sumatera area; 3<sup>rd</sup> quadrant is New Autonomous Region with high growth but low income, the one with high economic growth but *per capita* income lower than the average for Sumatera area; 4<sup>th</sup> quadrant is relatively retarded New Autonomous Region, the one with low

economic growth and lower *per capita* income compared with the average for Sumatera area (Kuncoro, 2012).

In 2001, 9 New Autonomous Regions belong to the 1<sup>st</sup> quadrant: Kuantan Singingi, Rokan Hulu, Rokan Hilir, Siak, Pelalawan, Dumai, Karimun, Natuna, and Batam regencies, 1 to the 2<sup>nd</sup> quadrant: Mentawai Island, 1 to the 3<sup>rd</sup> quadrant: Sorolangon, and 6 to the 4<sup>th</sup> quadrant: Muaro Jambi, Tanjung Jabung Timur, Tebo, Kota Metro, Way Kanan, and Lampung Timur Regencies.

The subsequent mapping is made considering the development of New Autonomous Region in the end of observation year, so that there is a shift since the enactment of local autonomy in 10 yr period. New Autonomous Regions belonging to the 1<sup>st</sup> quadrant are: Kuantan Singingi, Rokan Hulu, Rokan Hilir, Siak, Pelalawan, Dumai, and Batam (7 New Autonomous Regions), and none belongs to the 2<sup>nd</sup> quadrant, while those belonging to the 3<sup>rd</sup> quadrant are: Sarolangon, Muaro Jambi, Tanjung Jabung Timur, Tebo, Natuna, Kota Metro, and Lampung Timur regencies (8 New Autonomous Region), and those belonging to the 4<sup>th</sup> quadrant are: Mentawai Islands and Way Kanan Regency (2 New Autonomous Regions).

### Potential Sector in New Autonomous Region

Discussion on the determination of superior/potential sectors in this research is conducted using several analysis instruments: Location Quotient (LQ) and Shift Share Analyses (SSA). To obtain potential sectors in New Autonomous Regions of Sumatera, the combination of Klassen's New Autonomous Region, Location Quotient (LQ) and Shift Share is used, by considering New Autonomous Region typology, base and non-base sectors. The sectors having growth and competitiveness (comparative advantage) over the same sectors in province can be seen in table below:

<b>NAR</b>	<b>Sector</b>	<b>B/NB</b>	<b>Proportional growth (Pr)</b>	<b>Regional Growth (Dr)</b>	<b>Net Shift (Pr+Dr)</b>	<b>Potential sector</b>
K. Singingi	Agriculture	B	Rapid	High	Advanced	1
	Mining and Energy	NB	slow	High	Advanced	6
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	B	Rapid	High	Advanced	1
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	NB	Rapid	High	Advanced	5
	Financial, Lease & Company Service	B	slow	High	Advanced	2
	Services	B	Rapid	High	Advanced	1
Pelalawan	Agriculture	B	Rapid	High	Advanced	1
	Mining and Energy	NB	slow	Low	Slow	8
	Processing Industry	B	slow	High	Advanced	2
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	NB	Rapid	High	Advanced	5
	Trading, Hotel and Restaurant	NB	Rapid	High	Advanced	5
	Transportation and Communication	NB	Rapid	High	Advanced	5
	Financial, Lease & Company Service	B	slow	High	Advanced	2
	Services	NB	Rapid	High	Advanced	5
R. Hulu	Agriculture	B	Rapid	High	Advanced	1
	Mining and Energy	NB	slow	Low	Slow	8

	Processing Industry	B	slow	High	Advanced	2
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	B	Rapid	High	Advanced	1
	Trading, Hotel and Restaurant	NB	Rapid	High	Advanced	5
	Transportation and Communication	B	Rapid	High	Advanced	1
	Financial, Lease & Company Service	B	slow	High	Advanced	2
	Services	B	Rapid	High	Advanced	1
Siak	Agriculture	B	Rapid	High	Advanced	1
	Mining and Energy	B	slow	High	Advanced	2
	Processing Industry	B	slow	High	Advanced	2
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	NB	Rapid	High	Advanced	5
	Trading, Hotel and Restaurant	NB	Rapid	High	Advanced	5
	Transportation and Communication	NB	Rapid	High	Advanced	5
	Financial, Lease & Company Service	NB	slow	High	Advanced	6
Services	B	Rapid	High	Advanced	1	
R. Hilir	Agriculture	B	Rapid	High	Advanced	1
	Mining and Energy	B	slow	High	Advanced	2
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	B	Rapid	High	Advanced	1
	Construction	NB	Rapid	High	Advanced	5
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	B	Rapid	High	Advanced	1
	Financial, Lease & Company Service	B	slow	High	Advanced	2
	Services	B	Rapid	High	Advanced	1
Dumai	Agriculture	NB	Rapid	High	Advanced	5
	Mining and Energy	NB	slow	High	Advanced	6
	Processing Industry	B	slow	High	Advanced	2
	Electricity, Gas, Clean Water	B	Rapid	High	Advanced	1
	Construction	B	Rapid	High	Advanced	1
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	B	Rapid	High	Advanced	1
	Financial, Lease & Company Service	NB	slow	High	Advanced	6
	Services	B	Rapid	High	Advanced	1
Batam	Agriculture	NB	slow	Low	Slow	8
	Mining and Energy	NB	slow	Low	Slow	8
	Processing Industry	B	slow	High	Advanced	2
	Electricity, Gas, Clean Water	B	Rapid	High	Advanced	1
	Construction	NB	Rapid	Low	Advanced	7
	Trading, Hotel and Restaurant	B	Rapid	Low	Advanced	3
	Transportation and Communication	NB	Rapid	Low	Advanced	7
	Financial, Lease & Company Service	B	Rapid	Low	Lagged	3
	Services	NB	Rapid	Low	Lagged	7

Notes: 1=B, Dr+, Pr+; 2=B, Dr+, Pr-; 3=B, Dr-, Pr+; 4=B, Dr-, Pr-; 5=Nb, Dr+, Pr+; 6 = NB, Dr+, Pr-; 7 = NB, Dr-, Pr+; 8 = NB, Dr-, Pr-

Source: processed data; BPS, 2011

Table 2 indicates the New Autonomous Region group with the following criteria: quickly advancing and quickly growing areas and the result of Overlay of LQ and Shift share analysis. Agricultural and services sectors still become the base ones, with rapid sector growth and high competitiveness in the same sector against the province or the first potential sector criterion of



agricultural sector owned by 5 New Autonomous Regions (Kuantan Singingi, Pelalawan, Rokan Hulu, Siak and Rokan Hilir regencies), and services owned by 5 New Autonomous Regions (Kuantan Singingi, Rokan Hulu, Siak, Rokan Hilir regencies, and Dumai cities). The second alternative potential sector criterion-the base sector with slow growth but high competitiveness - includes processing industry sector belonging to 5 NARs (Pelalawan, Rokan Hulu, and Siak regencies, and Dumai and Batam cities), financial, lease, and company service sector belonging to 4 NARs (Kuantan Singingi, Pelalawan, Rokan Hulu and Rokan Hilir regencies), and mining and energy sector belonging to 2 NARs (Siak and Rokan Hilir regencies). The third alternative potential criterion the base sector with rapid growth and low competitiveness (comparative advantage) compared with the Province belongs only to Batam City including trading, hotel and restaurant, and financial, lease, and company service sectors. NARs belonging to the third quadrant or quickly developing (high growth but low income) NARs are the one with high economic growth rate but per capita income lower than individual provinces do in Sumatera, as shown in the Table 4 below:

**Table 4**  
**NARS WITH POTENTIAL SECTOR IN SUMATERA IN THE 3<sup>rd</sup> QUADRANT DURING 2001-2011**

NAR	SECTOR	B/NB	Proportional growth (Pr)	Regional Growth (Dr)	Net Shift (Pri+Drij)	Potential sector
Karimun	Agriculture	B	slow	Low	Lagged	4
	Mining and Energy	NB	slow	High	Advanced	6
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	B	Rapid	High	Advanced	1
	Construction	B	Rapid	High	Advanced	1
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	B	Rapid	High	Advanced	1
	Financial, Lease & Company Service	NB	Rapid	High	Advanced	5
	Services	B	Rapid	High	Advanced	1
Natuna	Agriculture	B	slow	Low	Lagged	4
	Mining and Energy	NB	slow	High	Lagged	6
	Processing Industry	NB	slow	Low	Lagged	8
	Electricity, Gas, Clean Water	NB	Rapid	Low	Lagged	7
	Construction	B	Rapid	Low	Advanced	3
	Trading, Hotel and Restaurant	B	Rapid	Low	Lagged	3
	Transportation and Communication	B	Rapid	Low	Lagged	3
	Financial, Lease & Company Service	NB	Rapid	Low	Lagged	7
	Services	B	Rapid	Low	Lagged	3
Sarolangun	Agriculture	B	slow	Low	Lagged	4
	Mining and Energy	NB	slow	High	Advanced	6
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	B	Rapid	Low	Advanced	3
	Trading, Hotel and Restaurant	NB	Rapid	High	Advanced	5
	Transportation and Communication	NB	slow	High	Lagged	6
	Financial, Lease & Company Service	B	Rapid	High	Advanced	1
	Services	NB	slow	High	Advanced	6
M. Jambi	Agriculture	B	slow	Low	Lagged	4
	Mining and Energy	B	slow	Low	Lagged	4
	Processing Industry	B	slow	Low	Lagged	4
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	NB	Rapid	Low	Advanced	7

**Table 4**  
**NARS WITH POTENTIAL SECTOR IN SUMATERA IN THE 3<sup>rd</sup> QUADRANT DURING 2001-2011**

	Trading, Hotel and Restaurant	NB	Rapid	High	Advanced	5
	Transportation and Communication	NB	slow	Low	Lagged	8
	Financial, Lease & Company Service	NB	Rapid	Low	Lagged	7
	Services	NB	slow	High	Lagged	6
Tj. Timur	Agriculture	B	slow	High	Advanced	2
	Mining and Energy	B	slow	High	Advanced	2
	Processing Industry	B	slow	High	Advanced	2
	Electricity, Gas, Clean Water	NB	Rapid	Low	Advanced	7
	Construction	NB	Rapid	High	Advanced	5
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	NB	slow	High	Advanced	6
	Financial, Lease & Company Service	NB	Rapid	High	Advanced	5
	Services	NB	slow	High	Advanced	6
Tebo	Agriculture	B	slow	High	Advanced	2
	Mining and Energy	NB	slow	High	Advanced	6
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	B	Rapid	High	Advanced	1
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	B	slow	High	Advanced	2
	Financial, Lease & Company Service	B	Rapid	High	Advanced	1
	Services	B	slow	High	Advanced	2
L. Timur	Agriculture	B	slow	High	Advanced	2
	Mining and Energy	B	slow	High	Advanced	2
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	NB	slow	High	Advanced	6
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	NB	Rapid	High	Advanced	5
	Financial, Lease & Company Service	NB	Rapid	High	Advanced	5
	Services	NB	slow	High	Advanced	6
Metro	Agriculture	NB	slow	High	Advanced	6
	Mining and Energy	NB	slow	Low	Lagged	8
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	B	Rapid	High	Advanced	1
	Construction	NB	slow	High	Advanced	6
	Trading, Hotel and Restaurant	B	Rapid	High	Advanced	1
	Transportation and Communication	B	Rapid	High	Advanced	1
	Financial, Lease & Company Service	B	Rapid	High	Advanced	1
	Services	B	slow	High	Advanced	2

Notes: 1 = B, Dr+, Pr + ; 2 = B, Dr+, Pr-; 3 = B, Dr-, Pr+; 4=B, Dr-, Pr-; 5=NB, Dr+, Pr+; 6=NB, Dr+, Pr-; 7=NB, Dr-, Pr+; 8=NB, Dr-, Pr-

Source: Processed data; BPS, 2011.

From Table 3, it can be seen that trading, hotel and restaurant sector is the first alternative potential sector (the base sector with higher growth and higher competitiveness (comparative advantage) compared with that in province) belonging to 5 NARs (Karimun, Tj. Timur, Tebo, Lampung Timur regencies, and Metro city); the second alternative potential sector (the base sector with slower growth but higher competitiveness (comparative advantage) compared with that in the provinc) includes agricultural sector belonging to 3 NARs Tj. Timur, Tebo and

Lampung Timurregencies), mining and energy sector belonging to 2 NARs (Tj. Timur and Lampung Timur regencies), and services sector belonging to 2 NARs (Tebo regency and Metro city). The New Autonomous Regions belonging to the 4<sup>th</sup> quadrants, the relatively lagged ones (low growth and low income), or those with lower economic growth and per capita income compared with those in individual provinces of Sumatera can be seen in Table 5.

NAR	SECTOR	BASE	Proportional Growth (Pr)	Regional Growth (Dr)	Net Shift (Pri+j+Drij)	Potential Sector
Mentawai Islands	Agriculture	B	slow	Low	Lagged	4
	Mining and Energy	NB	slow	Low	Lagged	8
	Processing Industry	NB	slow	Low	Lagged	8
	Electricity, Gas, Clean Water	NB	Rapid	Low	Lagged	7
	Construction	NB	Rapid	High	Advanced	5
	Trading, Hotel and Restaurant	B	slow	Low	Lagged	4
	Transportation and Communication	NB	Rapid	Low	Advanced	7
	Financial, Lease & Company Service	NB	Rapid	Low	Lagged	7
	Services	NB	slow	Low	Lagged	8
W. Kanan	Agriculture	B	slow	High	Advanced	2
	Mining and Energy	NB	slow	High	Advanced	6
	Processing Industry	NB	slow	High	Advanced	6
	Electricity, Gas, Clean Water	NB	Rapid	High	Advanced	5
	Construction	NB	slow	High	Advanced	6
	Trading, Hotel and Restaurant	NB	Rapid	High	Advanced	5
	Transportation and Communication	NB	Rapid	High	Advanced	5
	Financial, Lease & Company Service	NB	Rapid	Low	Advanced	7
	Services	NB	slow	High	Advanced	6

Notes: 1=B, Dr+,Pr+; 2=B, Dr+, Pr-; 3=B, Dr-, Pr+; 4=B, Dr-, Pr-; 5=NB, Dr+, Pr+; 6=NB, Dr+, Pr-; 7=NB, Dr-, Pr+; 8=NB, Dr-, Pr-

Source: Processed Data; BPS, 2011

Considering Klassen's typology, out of NARs in Sumatera as shown in Tables 2-4 belongs to lagged region: Mentawai Island and Way Kanan regencies; it is these two regencies have no 1<sup>st</sup> alternative potential sector (the base sector with higher growth and higher competitiveness (comparative advantage) compared with the one in Province). Then, agricultural sector becomes the 2<sup>nd</sup> alternative potential one (the base sector with slow growth but higher comparative advantage than the one in province) belonging to Way Kanan Regency, while Mentawai Islands Regency has only agricultural and trading, hotel, and restaurant sectors included into the fourth alternative potential sector (the base sector with slow growth and lower comparative advantage than the one in Province).

### **The Effect of Government Expenditures in Education, Health, Agricultural, Housing, Communication, and Social Fields On the Economic Growth**

The model employed to analyze the effect of government expenditure on economic growth in regencies/municipals constituting NARs was regression analysis with panel data. The model estimated in this research is:

$$Y=f(PEND, KES, PERT, PERUM, TRANS, SOSIAL, DLQ>I(sectori) \dots\dots\dots(1)$$

From equation 1, it can be found:

$$E_G = f(PEND^{a1} KES^{a2} PERT^{a3} PERUM^{a4} TRASN^{a5} SOSIAL^{a6} DLQ > I( \text{sektor}_i )^\beta \dots\dots\dots (2)$$

Using a linear empirical model, the 2<sup>nd</sup> equation is derived using ln (natural logarithm), so that the following regression equation is obtained

$$E_{G_{it}} = \alpha_0 + \alpha_1 \ln PENDING_{it} + \alpha_2 \ln KES_{it} + \alpha_3 \ln PERT_{it} + \alpha_4 \ln PERUM_{it} + \alpha_5 \ln TRASN_{it} + \alpha_6 \ln SOSIAL_{it} + \beta_1 D1_i + \beta_2 D2_i + \beta_3 D3_i + \beta_4 D4_i + \beta_5 D5_i + \beta_6 D6_i + \beta_7 D7_i + \beta_8 D8_i + \beta_9 D9_i + \varepsilon_t \dots\dots\dots (3)$$

Considering this model, the test is conducted on *fixed effect* or *random effect* models.

**Estimation model selection**

In panel data method, there are three methods used: *pooled least square*, *fixed effect* and *random effect*. To find out the model to be selected, *fixed effect* or *random effect*, Hausman test is conducted (Tables 6 & 7). From the calculation using Eviews 8 software, the following result is obtained.

Table 6 REDUNDANT FIXED EFFECTS TESTS			
Test cross-section fixed effects			
Effects Test	Statistic	df.	Prob.
Cross-section F	7.794239	(16.139)	0.0000
Cross-section Chi-square	108.862536	16	0.0000

The result shows that both F-test and chi-square are significant (p-value 0.000 is less than 5%) so that *H0* is not supported and *H1* is supported, so that the model follows fixed effect. Therefore, the next step is Hausman test. The result of Hausman test with Eviews 8 software help is as follows:

Table 7 CORRELATED RANDOM EFFECTS-HAUSMAN TEST			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	117.694982	14	0.0000

Source: processed data

Considering the result of Hausman Test, the method employed in this research is Fixed Effect one.

**Result of Regression Calculation**

After the regression equation is considered as passing through identification test, the next process is to estimate panel data model using Ordinary Least Square (OLS). Corresponding to the result of Hausman specification test, in this research the regression equation is conducted using Fixed Effect Model (FEM). The output of processing using fixed effect model estimation can be written in the regression equation below:



$$\text{LN\_EG} = 1.191 + 0.010 * \text{LN\_KES} + 0.063 * \text{LN\_PEN} - 0.0118 * \text{LN\_PERUM} + 0.035 * \text{LN\_PERT} - 0.007 * \text{LN\_SOS} - 0.025 * \text{LN\_TRANS} + 0.025 * \text{D2} - 0.185 * \text{D3} - 0.030 * \text{D4} - 0.037 * \text{D5} - 0.004 * \text{D6} + 0.044 * \text{D7} - 0.085 * \text{D8} + 0.037 * \text{D9}$$

The result of regression estimation using panel data shows that there is autocorrelation, as indicated with  $D-W_{\text{stat}}$  value of 1.728. Autocorrelation incidence can be affected by many factors; each economic policy will usually need time period to affect economic system, or in other words, time interval confound variables will be interrelated. Widarjono (2003) says that economic policy or economic activity such as monetary or fiscal policy does not occur instantaneously but it needs time or lag. Thus, the following model will be used.

Lag Model 1			Lag Model 2			Lag Model 3		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
C	1.373714	0.0000	C	1.519562	0.0000	C	1.388471	0.0000
LN_KES (-1)	0.003928	0.7912	LN_KES (-2)	0.012254	0.1184	LN_KES (-3)	0.032560	0.0099
LN_PEN	0.052208	0.0033	LN_PEN	0.023976	0.0448	LN_PEN	0.027914	0.0333
LN_PERUM	-0.013311	0.0481	LN_PERUM	-0.012667	0.0230	LN_PERUM	-0.018842	0.0085
LN_PERT	0.021743	0.1071	LN_PERT	0.024516	0.0914	LN_PERT	-0.004242	0.5483
LN_SOS	-0.001461	0.8527	LN_SOS	0.005846	0.4521	LN_SOS	0.030053	0.0001
LN_TRANS	-0.022250	0.0887	LN_TRANS	-0.022773	0.0335	LN_TRANS	-0.009383	0.3181
D2	0.062196	0.2853	D2	0.071704	0.2580	D2	0.005277	0.9204
D3	-0.105473	0.2437	D3	-0.037551	0.5773	D3	-0.244190	0.0018
D4	-0.003587	0.9063	D4	-0.022674	0.3302	D4	-0.055733	0.0174
D5	0.027874	0.2892	D5	0.050828	0.0766	D5	0.067813	0.0055
D6	-0.000856	0.9734	D6	-0.037249	0.1007	D6	-0.065029	0.0000
D7	0.035883	0.1568	D7	0.052780	0.0096	D7	0.066999	0.0011
D8	-0.062647	0.0759	D8	-0.052902	0.1540	D8	-0.041806	0.4861
D9	0.026747	0.3499	D9	0.016719	0.5380	D9	0.035835	0.1297
R <sup>2</sup>	0.769481		R <sup>2</sup>	0.822780		R <sup>2</sup>	0.898703	
F-statistic	13.57465		F-statistic	16.24946		F-statistic	26.02452	
D-W stat.	1.708539		D-W stat.	1.750601		D-W stat.	2.045020	

Source: Processed data

Table 8 shows that autocorrelation problem is still indicated until lag2, and there is a change of 2.05020 in lag 3 with  $D-W_{\text{stat}}$ ; therefore this research employs lag (3) as estimated regression result. From the result of estimation, it can be seen that there are two insignificant variables: government expenditures in agricultural and in transportation/communication sector, with  $R^2$  of 0.898703 or in other words, 89.87% of economic growth change in NARs throughout Sumatera can be explained by determinant variable in the model, while the rest of 10.13% is explained by other variables excluded from the model. Thus, this study employs the result of calculation with lag model 3.

### **Hypothesis Testing on the Effect of Individual Independent Variables on Economic Growth in NARs in Sumatera**

The result of calculation shown in Table 9 suggests that local government expenditure in education sector affects the economic growth of NARs in Sumatera positively and significantly at significance level of 95% ( $\alpha=5\%$ ), with Probability value of 0.033, because it is  $<0.05$ ; therefore this variable is in the area supporting  $H_a$  or not supporting  $H_0$ . The coefficient of government expenditure in education sector is inelastic.

<b>Independent Variable</b>	<b>Coefficient</b>	<b>Prob.</b>	<b>Correlation Found</b>	<b>Significance</b>
C	1.388	0.000	Positive (+)	Significant
Government Expenditure in Health Sector (KES(-3))	0.033	0.010	Positive (+)	Significant
Government Expenditure in Education Sector (PEN)	0.028	0.033	Positive (+)	Significant
Government Expenditure in Housing Sector (PERUM)	-0.019	0.009	Negative (-)	Significant
Government Expenditure in Agricultural Sector (PERT)	-0.004	0.548	Negative (-)	Insignificant
Government Expenditure in Social Sector (SOS)	0.030	0.000	Positive (+)	Significant
Government Expenditure in Transportation Sector (TRANS)	-0.009	0.318	Negative (-)	Insignificant

Source: Processed data

Local government expenditure in health sector affects the economic growth of NARs in Sumatera positively and significantly, at significance level of 95% ( $\alpha=5\%$ ), with Probability value of 0.010, because the value is  $<0.005$  in lag3, with coefficient value of government expenditure in health sector of 0.033, meaning when there was an increase of 1% in government expenditure in health sector three years ago, economic growth will increase by 0.033 percent today.

Local government expenditure in agricultural sector affects economic growth of NARs in Sumatera negatively and insignificantly. Local government expenditure in housing sector affects economic growth of NARs in Sumatera negatively and significantly at significance level of 95% ( $\alpha=5\%$ ) with Probability value of 0.009 or less than  $<0.005$ , so that this variable is in the area supporting  $H_a$  or not supporting  $H_0$ . The coefficient of government expenditure in housing sector is -0.019, meaning that a 1% increase in government expenditure in housing sector will decrease economic growth by 0.019%. Local government expenditure in transportation sector affects economic growth negatively and insignificantly. Local government expenditure in social sector affects positively and significantly the economic growth of NARs in Sumatera at significance level of 95% ( $\alpha=5\%$ ), with probability value of 0.000 and inelastic coefficient of government expenditure in social sector.

Economic growth of NARs is different between one region and another having base economic sector. The result of dummy variable estimation at significance level of 95% ( $\alpha=5\%$ ) shows that 6 sectors have probability value  $<0.05$  (significantly), agricultural, processing industry, electricity, gas and clean water, construction, trading, hotel, and restaurant, and transportation and communication sectors meaning that those six sectors are the ones that can support economic growth in NARs.

## CONCLUSION

Potential sector belonging to regions, particularly those with high growth and high income criteria, having with base sector and high growth and high competitiveness against the

province is still dominated with agricultural and services sectors. Local government expenditure in education, health, and social sectors affects the growth positively and significantly, while local government expenditure in agricultural and transportations sectors does not affect economic growth significantly, and local government expenditure in housing sector affects economic growth of NARs negatively and significantly.

Economic development of NARs is different between one region and another having base economic sector. The result of dummy variable estimation at significance level of 95% ( $\leq 5\%$ ) shows that 6 sectors have probability value  $< 0.05$  (significantly), agricultural, processing industry, electricity, gas and clean water, construction, trading, hotel, and restaurant, and transportation and communication sectors meaning that those six sectors are the ones that can support economic growth in NARs.

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