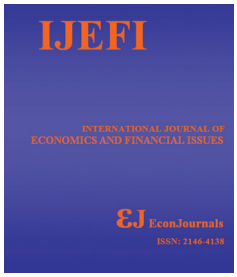

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How Leading Economic Sectors Stimulate Economic Growth, Income and Labor Absorption? Input - Output Approach

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ABSTRACT

Indonesia as emerging market economics provide some policies that leads to pro-growth, pro-poor and pro-job. This study aims to analyze which sectors are able to stimulate economic growth, household income, and labor absorption in South Sumatera Province. We analyze input-output analysis which was estimated using RAS method. The analysis of output multiplier number used in this study to determine which sectors trigger the economic growth. At other hand, the income multiplier number is used in determining which sectors generate the income level, while the employment multiplier number determines he highest labor-absorbing economic sector. In the result, there are five economic sectors which is the main driver of economic growth: (1) Industry of coal and fuel refinery; (2) Industry of metal, computers, electronics, optical and electricity equipment; (3) industry of foods and beverages; (4) Farms and livestocks; (5) Electricity and gas installment, ice production, water supply and recycle of garbage. The five leading economic sectors generating the labor income increasement are: (1) Administration of government, national defense and mandatory social security; (2) service of education, health and social activities; (3) rail transportation; (4) service of financial brokerage, insurance, pension fund and financing supports; (5) mining and quarrying of miscellaneous materials. The five leading economic sectors generating the absorption of labor force are: (1) Other services; (2) plantation; (3) farmings and livestocks; (4) foods agricultural; and (5) forestry and logging. The direction of economic transformation in South Sumatera Province should tribute attention to the importance of pro-growth, pro-poor, pro-job policy.

Keywords: Leading Economic Sectors, Pro-growth, Pro-poor and Pro-job Policy
JEL Classifications: R10, R11, R15

1. INTRODUCTION

The structural transformation is one of instrument to drive economic growth in Indonesia. The government has the reallocation of economic activity across sectors agriculture, manufacturing and services. Structural transformation has also received a lot of attention in the policy debate of developed countries where various observers have claimed that the sectoral reallocation of economic activity is inefficient, and calls for government intervention (Growth et al., 2013). This research extends our previous research Mardalena (2016) on the inter-economic linkages of economic sectors in South Sumatera Province using Input-Output (I-O) approach in 2014. The study aims to find the potential economic sectors which will be the focus of the development, in order to accelerate the economic growth of South Sumatra. One of the recommendations in the previous research that further research should be conducted in analyzing the leading economic sectors in enhancing the economic growth, the increasement of labor income and the labor-absorption (Mardalena, 2016).

According to Todaro and Smith (2011) investment will affect the regional structural transformation, economic growth, labor absorption and inter-regional trade patterns. The increasement in leading economic sectors growth could be possible if the investment in that sector is increased. It continually will affect the amount of sectoral output, labor-absorption and household income.

The Table 1 shows the growth value of each sector continues to increase during 2011–2016. This indicates that economic growth of South Sumatra experienced contraction from 2011 to 2016. The highest growth value is from finance, insurance, building rental, land and enterprise services (9.77%). The list of 9 sectors from highest growth value to lowest growth value are (1) finance, insurance, building rental, land and enterprise services (9.77%). (2) Electricity, gas and clean water supply (9.23%); (3) transport, warehouse and communication (8.95%); (4) construction (7.78%); (5) groceries, retails, restaurants, and hotels (7.17%); (6) community, social, and individual services (6.69%); (7) manufacturing Industry (5.81%); (8) agriculture, forestry, hunting and fishery (4.44%); and (9) mining and quarrying (3.84%).

In line with the growth of economic sectoral in South Sumatra Province, each sector contributes to the establishment of Indonesia's GDP value. Table 2 shows the magnitude of the sectoral contribution South Sumatra's GDP to Indonesia's GDP in 2011-2016. The field of business is ordered based on the largest contribution value among others, they are: (1) Transportation, warehouse and communication (21.07%); (2) agriculture, forestry, hunting and fishery (19.92%); (3) construction (19.48%); (4) manufacturing industry (19.45%); (5) community, social, and individual services (19.42%); (6) finance, insurance, building, land and services (18.96%), (7) grocery, retail, restaurant and hotel (18.44%); (8) mining and quarrying (17.37%) and (9) electricity, gas and clean water supply (16.95%).

The GDRP of South Sumatra substantially contributes to each sector Indonesia's GDP, as reflected by the average contribution value of each sector ranged from 16% to 21%. It meansevery sector of the business field in South Sumatra Province plays a role in supporting Indonesia's GDP growth (Graph 1).

The Graph 1 shows the contribution of each sector to GRDP and the share of GRDP on employment absorption during 2015 and 2016 in South Sumatera province. In 2015 the largest contribution to GRDP is mining and quarrying sector about 21.79% and fell to 21.34% in 2016. The amount of GDP in the mining and quarrying sector does not have a major impact on labor absorption since it only absorbs 1.56% of the total laborforce by 2015. In contrast to the agriculture, forestry, hunting and fishery sector that contributes only 18.98% to GDRP in 2015, but it can absorb 54.74% of workers from the total labor absorbed by all sectors in South Sumatra Province. The sector that contributes to the GRDP is not

Table 1: Economic growth in south sumatera

Business field	South sumatera province			
	GDRP (million rupiah)		Change	
	2011	2016	Absolute	Growth (%)
Agriculture, forestry, hunting and fishery	40,120,773.00	49,033,651.00	8912.878	4.44
Mining and quarrying	47,761,798.00	56,926,085.60	9164.288	3.84
Manufacturing industry	38,750,666.00	49,998,125.10	11,247.459	5.81
Electricity, gas and clean water supply	392,335.70	573,439.00	181.103	9.23
Construction	22,217,344.00	30,862,675.80	8645.332	7.78
Grocery, retail, restaurant and hotel	22,069,873.00	29,982,707.30	7912.834	7.17
Transportation, warehouse and communication	9,479,962.00	13,723,294.50	4243.333	8.95
Financial, insurance, building rental, land and enterprise services	10,347,672.60	15,404,000.40	5056.328	9.77
Community, social and individual services	15,220,275.00	20,311,433.30	5091.158	6.69

Source: BPS, Sumatera Selatan dalam Angka 2017

Graph 1: Share of GDRP labors in South Sumatera province year 2015 and 2016

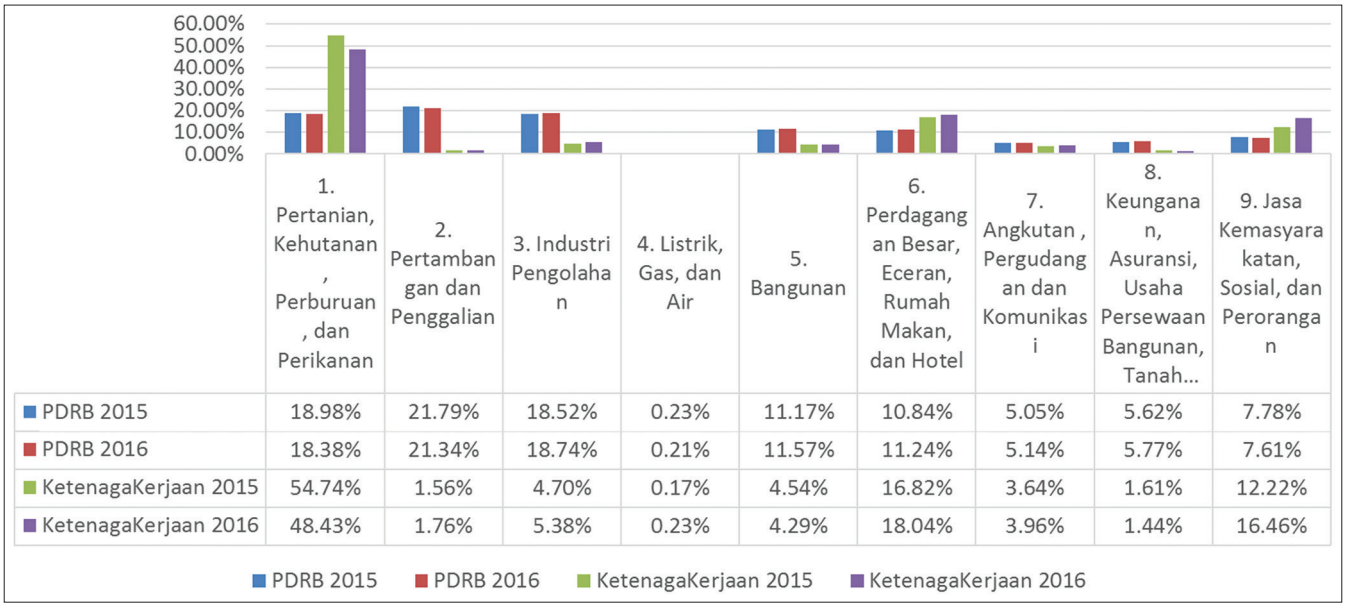


Table 2: Percentage of GRDP contribution to Indonesia's GDP (in million rupiah)

Business field	South sumatera GDRP		GDP Indonesia		Contributionn of percentage		Average (%)
	2011	2016	2011	2016	2011	2016	
Agriculture, forestry, hunting and fishery	40,120.773	49,033.651	993,857.300	1,209,687.200	4.037	4.053	19.92
Mining and quarrying	47,761.798	56,926.086	748,956.300	775,485.600	6.377	7.341	17.37
Manufacturing industry	38,750.666	49,998.125	1,607,452.000	2,017,555.100	2.41	2.478	19.45
Electricity, gas and clean water supply	392.334	601.815	82,803.200	107,644.500	0.474	0.559	16.95
Construction	22,217.344	30,862.676	683,421.900	925,062.500	3.251	3.336	19.48
Grocery, retail, restaurant and hotel	22,069.873	29,982.707	1,227,221.600	1,537,425.300	1.798	1.950	18.44
Transportation, warehouse and communication	9,479.962	13,723.294	547,467.800	834,934.000	1.732	1.644	21.07
Financial, insurance, building rental, land and enterprise services	10,347.673	15,404.000	578,123.700	816,029.300	1.790	1.888	18.96
Community, social and individual services	15,220.275	20,311.433	673,330.400	872,367.400	2.260	2.328	19.42

Source: BPS, Sumatera Selatan dalam Angka 2017

Table 3: I-O table (3×3 sector)

Output allocation input arrangement	Intermediate demand			Final demand	Output quantity
	Production sector				
	1	2	3		
Production sector					
1	x_{11}	x_{22}	x_{13}	F_1	X_1
2	x_{21}	x_{22}	x_{23}	F_2	X_3
3	x_{31}	x_{32}	x_{33}	F_3	X_3
Quantity of primary input	V_1	V_2	V_3		
Quantity of input	X_1	X_2	X_3		

I-O: Input-output

necessarily able to create large employment too. Vice versa, it is able to absorb many labors is not necessarily able to contribute largely to the GRDP. So that, this study aims to analyze which sector triggers the economic growth, the increasing in labor income, and the largest absorbed labor in South Sumatra province.

The main urgency of this study is in line with the objective of RPJMDP South Sumatra Province. It confirms that the stages of development are directed to support comprehensive development in all fields, enhancement of competitiveness based on human resources excellence, regional infrastructure, science and technology, and conducive atmosphere. The result of this sector-related superior analysis is expected to give direction to the appropriate sectoral development focus in South Sumatera Province, and to answer the development priority and the improvement of the welfare stated in the RPJMD through the achievement of the first RPJMD mission by increasing the economic growth both from expenditure and production side. The economic development is expected to be able to stimulate few aspects: (1) Puchasing power of household; (2) improvement of investment; (3) improvement of budget-absorption and improvement of quality of expenditure; and (4) improvement of export competitiveness. In terms of production, economic growth is directed at encouraging: (1) Industrial value-added; (2) inter-regional trade; and (3) infrastructure improvements.

2. LITERATURE REVIEW

2.1. I-O Model

According to Todaro (2000. p. 222), the broad and general development planning model can be divided into two basic categories: (1) Aggregate growth model; and (2) multisector I-O model. These planning models are important, especially for the I-O approach, because the approach of this model takes into account the fact that economic activity in the major industrial sectors is constantly interconnected with each other in the form of simultaneous algebraic equations, which will eventually show the production process or technology used in each industry sector.

Based on the Central Bureau of Statistics (2008) I-O table is a system arranged in the form of matrixes that describe the transactions of goods and services between sectors of the economy. Aspects to be displayed by input table - Output is that each sector has a linkage or dependence towards other sectors. The tightness of dependence of all sectors is determined by the amount of input used in the production process. To give an overview of I-O, the Table 3 is an illustration of the I-O table by simplifying an economic system into three production sectors, also called an I-O table matrix 3 × 3 sectors as follows.

On the horizontal rows, the numbers show how much the output each sector is allocated. It is allocated to fulfill the intermediate demand, while the other part is used to fulfill final output. The intermediate output is a demand of goods and services used for the process of production, while the final demand is the demand for final consumption, including in it are: Household consumption, government expenditures, capital formation and export. On the other hand, the vertical lines or columns show the usage of intermediate inputs and the primary input provided by other economic sectors for the implementation in the production process. The primary input is more commonly known as value added, which consists of wage or salary, land rent, net interest and business surplus.

The explanation of the figure above shows that the arrangement of numbers in the matrix shows an inter-dependent link among

sectors. Taking an example from the illustration above, it can be explained that the output sector 1 is XI, which is allocated in a row x_{11}, x_{12}, x_{13} respectively to sectors 1, 2 and 3 as intermediate demands, and F1, to fulfill the final demand.

The allocation of the output as a whole can be illustrated in the form of algebraic equations as follows:

$$x_{11}+x_{12}+x_{13}+F_1=X_1$$

$$x_{21}+x_{22}+x_{23}+F_2=X_2 \quad (2.1)$$

$$x_{31}+x_{32}+x_{33}+F_3=X_3$$

the equation above can be reformulated into:

$$\sum_{j=1}^{3} x_{ij} + F_1 = X_1 \quad \text{to be I=1,2,3} \quad (2.2)$$

Where x_{ij} is the number of sector i outputs used as inputs by sector j, and F_i is the final demand for sector i, while vertically, especially in the production sector, the input structure of a sector. The overall algebraic equation can be formulated as follows:

$$x_{11}+x_{21}+x_{31}+V_1=X_1$$

$$x_{12}+x_{22}+x_{32}+V_2=X_2 \quad (2.3)$$

$$x_{13}+x_{23}+x_{33}+V_3=X_3$$

$$\sum_{i=1}^{3} x_{ij} + V_1 = X_1 \quad (2.4)$$

Where V_1 is the primary input (value added) of sector j.

In the I-O analysis, the equation system plays an important role as the basis of economic analysis, if $a_{ij}=x_{ij}/X_j$ (where a_{ij}=input coefficient) or $x_{ij}=a_{ij}X_j$, then equation (2.1) can be substituted:

$$a_{11}X_1+a_{12}X_2+a_{13}X_3+F_1=X_1$$

$$a_{21}X_1+a_{22}X_2+a_{23}X_3+F_3=X_2 \quad (2.5)$$

$$a_{31}X_1+a_{32}X_2+a_{33}X_3+F_3=X_3$$

in the form of the matrix equation, equation (2.5) would be:

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} + \begin{bmatrix} F_1 \\ F_2 \\ F_3 \end{bmatrix} = \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix}$$

A X F X

$$AX+F=X \text{ or } (I-A)\,X=F \text{ or}$$

$$A=(I-A)^{-1}F \quad (2.6)$$

From equation (2.6) it appears that the output has a functional relationship in being the final demand with $(I-A)^{-1}$ as the direction coefficient, which will later be referred as the output multiplier matrix and becomes the basis for the development of I-O model.

2.2. Intermediate Input

The intermediate input includes the use of various goods and services by a sector in production activities. The goods and services are derived from the production of other economic sectors, as well as their own production. some kind of intermediate goods are used for produce goods in the economy, and these goods are in turn often used as intermediaries (Jones, 2011). The goods used as the intermediate inputs are usually disposable, such as raw materials, miscellaneous materials, fuel and other. In I-O model, the usage of intermediate inputs is the linkage among the economic sectors and denoted by x_{ij}, the intermediate input from sector I production used by sector j in order to produce output x_j. In Table I-O, the intermediate input is assessed by two types of price. The intermediate input with the basis of the purchaser price, including the distribution margin (the trader profit and transport cost) in it. Conversely, the intermediate input on the basis of the producer price of the use of factory price as its basis. Conversely, the intermediate input on the basis of the producer price use the factory price as its basis, which the distribution margin is not included in it. Further distribution margins are required as inputs from the trade and transport sectors. Intermediate input consists of two components, namely local components and imported components. I-O table illustrates the direct production relationships in the regions with different user sectors.

Primary input or value added is a reward created or obtained from the factors of production that play a role in the production process. Such remuneration includes wage and salary, business surplus, depreciation and indirect tax. Wage and salary are remuneration paid to workers or employees, whether in money or goods form. Wage and salary are consist of all kind of payments (housing, vehicles, health), bonuses, overtime-working paid by employers to workers. The wages and salary are still in gross value of all those payments before being deducted by the income tax. Business surplus includes rental of property (land, copyright and patent), net interest and corporate profit (before taxes, and before being distributed to all shareholders as dividends). Depreciation represents the value of the company's allowance for the accumulated replacement of capital goods that are used. Indirect taxes are taxes imposed by the government for any sales transactions conducted by company, such as value added tax.

In the I-O model, the primary input (value added) is usually denoted by Vj. And for each component use h notation. Thus Vj is the added value created in sector j for the component. In I-O Table, the final demand includes household consumption expenditure, government consumption expenditure, fixed capital formation, change of sticks, exports and imports.

Household consumption spending includes all purchases of goods and services by households, both for food and non-food items. Including the purchase of durable goods, such as household equipment, vehicles and so forth. The only purchase that is not included in household consumption is residential buildings, because it is considered as the formation capital in the rental sector of the building. Household consumption includes goods of its own production and the provision of other parties.

Government consumption expenditure covers all annual purchases of goods and services by government (current expenditure), including salary payments of employees (personnel expenditures). At the other hand, the development expenditures for the procurement of facilities and various capital goods are included in the formation of capital.

Formation of fixed capital includes all expenditures for the procurement of capital goods either by government or private companies (business). Capital goods may consist of buildings and constructions, machinery and equipment, vehicles and transport and other capital goods. Whereas actual stock change are also the formation of capital, but is indefinite derived from the difference between the ending stock and the initial stock of the calculation period. Stock is usually the amount of products that have not been sold by the seller, or in consumer side, the amound of products that has not been used.

Input coefficient in accordance with the principle of preparation of I-O, the number of Input (X_j) must be equal to the amount of output. The output for each input component between the sum of outputs is called the input coefficient between (a_{ij}), where $a_{ij}=x_{ij}/x_j$. The output between the primary input and the output is called the primary input coefficient (v_j), where $v_j=v_j/x_j$. The number of intermediate input coefficients and the primary input is equal to 1, consequently if aij is greater then v_j becomes small and vice versa. High intermediate coefficients indicate a low level of efficiency.

The intermediate input coefficient is very important in I-O model analysis. Its usefulness is among others to see the most dominant input components, the role of raw material and energy use, the level of bank service usage, communication, transportation and so on. Meanwhile, the primary input coefficient shows the role and composition of wages and salaries, business surplus, indirect taxes and depreciation.

2.3. Multiplier Number Analysis

According to Widodo (2006. p. 176-179) one of analysis type commonly used I-O model framework is the multiplier analysis. The central focus of multiplier analysis is to forecast what will happen to economic variables such as production, employment or regional income alongside with the changes in exogenous variables, like final demand. The multiplier number in the input-input analysis consists of the multiplier of production sector output (output multiplier), the household income, and the employment multiplier.

If multiplier number is obtained by using I-O model, then it will produce simple multiplier. This multiplier number incorporates the direct and indirect impact of an exogenous change.

2.3.1. Output multiplier number

An increase in final demand on an economic sector will increase the output of other economic sectors. Increased output of other sectors is created by the direct effects and indirect effects (inter-sector technical relations) of the increase in final demand. The amount of regional output multiple change is known as output multiplier number. Angka pengganda *output* (suatu sektor) adalah nilai total dari *output* yang dihasilkan oleh perekonomian untuk memenuhi (atau akibat) adanya perubahan satu unit uang permintaan akhir sektor tersebut. The output multiplier number (of a sector) is the total value of the output generated in an economy to affect the change of one unit of money in the sector final demand.

The amount of the output marker for the *n* sector in the economy is calculated from the sum of the *n* column of the Leontief Reverse matrix. By using the aij notation for the Leontief Reverse Matrix element, the output multiplier is defined as below:

$$O_j = \sum_{i=1}^{n} a$$

As example, the output multiplier number is 1.92 for agricultural sector, 2.19 for industrial sector, and 2.09 for services sector. These multipliers indicates that if there is an increase in the final demand of 1 unit in the agricultural sector will result in an increase in economic output of 1.92 units.

2.3.2. Income multiplier number

The change of a sector's final demand will also increase the income of the household in a community. The amount of this multiplication increase can be seen from the income multiplier number. According to Arsyad, L. (2010) and Arsyad, L. (2005), the employment income multiplier number of a sector shows the total labor income created by the addition of one unit of final demand money in the sector. This labor income multiplier is an increase in final demand in the form of labor income.

If there is a change in the final demand, there will also be a change in the output produced by each related factor of production in the economy. This is indicated by the output multiplier. Changes in the amount of output produced will certainly change the demand for needed labor, because the labor payment is a source of labor income (wages), then the changes in labor demand will affect the household income. The linkage between the total output of each sector and the labor cost is shown by the *n* row (n + 1) of the I-O matrix (which is barely the wage and salary component of the primary input matrix). This usually referred as the coefficient of wage and salary, which the value is the ratio between the amount of wages and salaries to the total value of its input.

If income multiplier figure of sector j is denoted by H_j then it can be written down as:

$$H = \sum_{i=1}^{n} an+1, aij$$

In other words, it is the multiplication of wage and salary coefficients with the value of the output multiplier. As exxample, if the income multiplier for the agricultural sector is 1.05, the industrial sector 0.9 and the service sector 1.02, hen the agricultural income multiplier number indicates that if there is a change in the final demand on the agricultural sector of Rp. 1,- it will affect income in the economy of Rp. 1.05.

2.3.3. Employment multiplier number

Another effect of an increase in final demand is the change in employment, as a result of increased production. The size of the

effect is calculated from the number of employment multipliers. The number of employment multipliers is the total effect of the change in employment in the economy, due to a unit of money changing the final demand in a sector. In order to find the effect of the change of final demand in a production sector towards the change of employment, the initial number of employment or the amount of initial number of labor in each production sector are required.

The data is used to calculate the average contribution of each worker in producing the output in the sector the worked. The average value of the output of each worker in sector j is noted with wj, as illustrated in the equation below:

$$w_j = \frac{Xj}{Lj}$$

Where Lj is the number of workers in sector j. The wj coefficient is more or less analogous to the coefficient an + 1j in the household income multiplier. Therefore, if the value of wj for all sectors in the economy can be calculated, a WR vector may be constructed:

$$WR=[Wn+1.1Wn+1.2\ldots Wn+1n]$$

The vector element of the WR is considered a row element (n + 1) of the I-O matrix A. The usual job-field multipliers used with Ej can be calculated from an open I-O model. From the Leontief Reversal matrix, we can calculate the amount of the extra output in the economy in the event of an additional final demand for a given sector. The additional output for each particular sector is indicated by the corresponding column of the Leontief Reverse matrix. The addition of final demand in sector j will cause additional output not only in sector j, but also additional output in sector i. In turn, the additional output in sector j will increase labor demand for the sector j. Furthermore, the additional output in sector i, due to additional final demand in the sector, will increase labor in sector i as well. Therefore, the employment effect of adding or changing one unit of output in sector j is equal to the number of j sector's job opportunity multipliers.

The number of job opportunity multipliers is obtained from the multiplication of the coefficient of labor with the number of output multipliers, where the value of labor coefficient is the ratio between the amount of sectoral labor with input.

$$E_{ij} = \sum_{i=1}^{n} Wn+1,iaij$$

If the agricultural sector has 20 workers in its labor force, industrial sector has 30 labor, and service sector has 35 workers then the value of multipliers of each sector is 0.38 for the agricultural sector, amounting to 0.27 for the industrial sector and 0.31 for the services sector. The agricultural sector multiplier number has a labor rate of 0.38 indicating that if there is a change in the final demand on the agricultural sector of 1 unit will cause an increase in labor absorption in the economy of 0.38 units. In other words, an increase in final demand of 100 units in the agricultural sector will result in a 38-unit employment change in the economy.

3. PREVIOUS STUDIES

The "Lewis Linkages" explained agriculture and economic growth that provide labor and capital the non-agricultural sector liberated by higher productivity in the agricultural sector (Lewis, 1954). This relation works primarily through factor markets, but there is no guarantee that these markets work perfectly in the dualistic arrangements. Syrquin and Chenery (1989) suggest that the main source of economic growth is the transfer of workers with low productivity from rural to urban sector. If the labor market is working perfectly, there will be little productivity gains from this structural transfer (Timmer, 2005).

The latest studies has conducted a research on the analysis of inter-sectoral economic linkages in South Sumatera Province by using I-O approach (Mardalena, 2016). The research concluded that there are 24 sectors serving as the the key sector: gas and petroleum mining, industry of coal and oil refinery, paper and pulp industry, automobiles, motorcycles and repairations, information and communication, financial and insurance provider services, rubber and its derivated products industry, plantations, mining and other excavations, coal and lignite mining, chemical industry, pharmaceutical and traditional medicine, food and beverage industry, forestry and logging, metal goods industry, livestocks farming, electricity, catering and accommodation services, wood industry, wooden and styrofoam products industry, construction, non-metallic minerals industry, and railway transportation. These 24 sectors are a potential sector that needs to be prioritized for development, because it will as well directly and indirectly bring impacts to the relevant other sectors, encouraging the growth of other sector outputs.

Deli (2011) found that there are 4 primary commodities in the agricultural sector in Nanggroe Aceh Darussalam Province: Forestry, upland rice fields (gogo), livestock farming sector and the palm oil sector. They have a high value-added and high labor multiplier and strong linkages to the agro-industry sector. Yifu (1992) used province-level panel data to assess the contribution of decollectivization, price adjustment, and other reforms to China's agricultural growth in the reform period. Decollectivization was found to increase the total factor of productivity and accounted for about half of the output growth during 1978-1984. State procurement price adjustments also contribute positively to output growth. The impact comes primarily from responses in input usage. The effects of other market related reforms on productivity and output growth are very small.

4. RESEARCH METHODOLOGY

This study focuses to analyze the leading economic sectors which trigger the economic growth, the income growth, and the employment in South Sumatera Province. We used I-O Table in 2014 which is estimated from I I-O Table from 1995 by using RAS method. Other secondary data used in the study were gathered from Central Institution of Statistic of South Sumatra, Bureau of Investment Services, and many literatures and other periodical publications.

4.1. Analysis Method

The following points are some application of I-O model in development planning (Widodo, 2006. p. 186):

1. The I-O model gives each economic sector an estimated level of production and imports that correspond to each other, in accordance with the final demand forecast.
2. The solution of this model helps to allocate the investment required to achieve the production level and this model provides a sharper test of the adequacy of available investment resources.
3. The need for well-educated workers is also invested in the same way.
4. The knowledge of the use of imported and domestically produced raw materials in various economic sectors help the analysis of import requirements and possible substitution to become easier.
5. In addition to the emerging needs for capital, labor and imports, indirect needs in other sectors of the economy can also be estimated.
6. Regional I-O models can also be used for planning purposes, to explore the implications of specific regional development programs.

4.2. Analysis of Regional Economic Growth Projection

Through production multiplier numbers or output multipliers, regional planners can determine which sectors have great potential in supporting the growth of regional economic output. The multiplier number can forecast the ability of a sector in encouraging the creation of new output if there is a change in demand in an economy. Sectors with high output multiplier values are the ones contribute in the increasing of regional economic growth. The recommendation from the multiplier analysis is the maximum effect of output changes will be created if the fund for final demand is spent in purchasing output with the greatest multiplier number. A slight purchasing in the outputs with smaller multiplier numbers will prevent the maximum effect of the output.

The analysis of income multiplier is an analysis used to determine the potential of a sector in profit gaining. With this analysis, regional government will be able to increase the regional profit quickly after knowing which sectors have high income multiplier. An employment multiplier analysis can be used to predict the number of labors required to cover the final demand changes occurring in an economic sector. Sectors owned by high job-employment multipliers are potential sectors to encourage the creation of new employment opportunities in an economy.

4.3. Research Framework

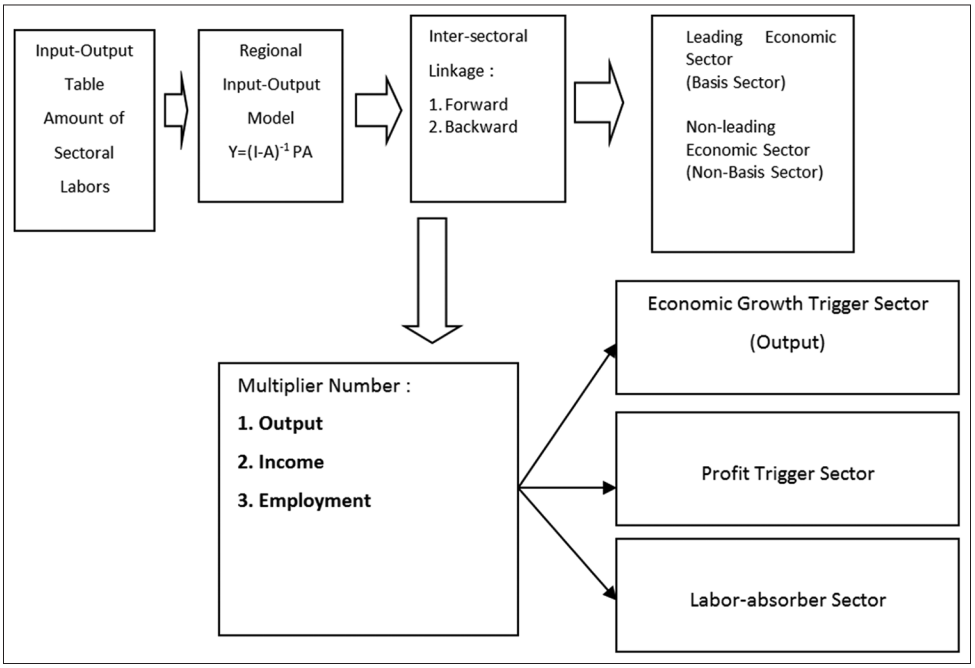
The framework for the analysis of the growth of economic sectors, income generators, and employment absorber is shown in Graph 2 (Widodo, 2006. p. 184).

4.4. Operational Definition of Variables

In accordance with the objectives of the study and the variables to be analyzed, the operational definition of the variables in this research are:

1. The final demand is the demand for goods and services for consumption purposes. The final demand consists of household consumption expenditure, government consumption expenditure, gross fixed capital formation (investment), and the changes of stock and export.
2. Primary input or value added is a profit gained or given to factors of production playing a role in the production process.
3. Input coefficient is the value-added coefficient derived from various sectors in producing a certain export unit.
4. Output is the value of goods and services produced by all economic sectors. There are 3 types of them: (1) Main production, (2) derived production, (3) side production.
5. Labor is included in the factor of production. In this term, labors are residents aged 15 years or over who work to earn income, at least an hour continuously for a week
6. Employment is the number of workers successfully absorbed in the economic sectors.

Graph 2: Research Framework



7. Gross Regional Domestic Product (GDRP) on the basis of Constant Price is the value of the final goods and services produced by the production units in Palembang City within a year period. In this study, the constant prices are referring to year 2010.
8. Implicit Price Index is a measure or index referring to the calculation of GRDP, which is the ratio between the value of GRDP at current prices with GDP at constant prices.
9. Output Multiplier Number is the total value of the output generated by the economy to cover the change of one unit of a sector's final demand.
10. Profit Multiplier Number is the accretion in the final demand in the form of household income.
11. Labor Multiplier Number is the total effect of the change in employment in the economy due to a unit change of the final demand in an economic sector.

5. RESULTS

5.1. Identification of Leading Sector Commodity in South Sumatera Province Based on Input-Output Table Year 2014

5.1.1. Distribution power and sensitivity of degree

One of the advantages of the analysis with the I-O model is that it can be used to find out the extent of the relationship between the production sectors. The level of forward linkage or also called the degree of sensitivity and the level of backward linkage commonly called the distribution power. From the distribution power and the degree of sensitivity, are also lowered the dissemination power index and sensitivity index. Many experts have used both indices to analyze and determine the key sectors (leading economic sectors) in economic development.

The sector with high distribution power indicates that the sector has high dependence on other sectors. Conversely, a sector with a high degree of sensitivity means that the sector has a strong forward linkage (driving force) compared to other sectors. The distribution power index indicates that, sectors with a distribution power index greater than 1, mean the sector's distributed power is above average overall power distribution. The same notion also applies to the index of degree of sensitivity.

Based on Table 4, in 2014 Industrial sector that has the highest distribution power in South Sumatera comes from industrial sector of Coal and Petroleum Refinery Industry whose power distribution index reaches 1.28254. This indicates that an increase of 1 unit of output of the sector will lead to an increase in output of other sectors (including its own sector) as a whole by 1.28254 units. The second rank is the industrial sector of goods of metal and the result of the distribution power index of 1.21622. The next largest sectors according to their respective distribution power index are the foods and drinks industry sector and the livestock farming sector. The complete description of the sector that has the highest and lowest distribution power of the South Sumatera I-O in 2014 is shown in the Table 4.

While the mining sector that has a high degree of sensitivity is the oil, gas and geothermal mining sector (2.5241), followed by the industrial sector namely the coal mining petroleum refinery industry (1.9629), paper, pulp and paper products (1.6182). Then the trade sector is the trade of automobiles, motorcycles and repairs (1.3433), the information and communication sector (1.1733), the financial services sector (1.1646), rubber and rubber-based goods (1.1312), plantation sector (1,1305), other mining and quarrying (1.1256) and coal and lignite mining sector (1,1004). the complete description of the sector that has the highest sensitivity index and the lowest awareness of i-o south sumatra 2014 seen in the Table 5.

5.1.2. Analysis of output growth-trigger leading economic sectors

The direction of economic transformation, if only considering the formation of economic growth (pro growth), then the 10 main sectors that can be developed in South Sumatra Province are the economic sectors in Table 6.

Table 4: Ranking of featured sector by distribution power index in input-output table in South Sumatera province 2014

Sector	Distribution power		Ranking
	Quanty	Index	
4. Livestocks Farming	1.5548	1.19707	4
11. Coal and petroleum refinery industry	1.6658	1.28254	1
12. Foods and drinks industry	1.5663	1.20591	3
13. Tobacco processing	1.3609	1.04775	13
15. Woods, wooden and styrofoam-based goods, bamboo and rattan woven goods and miscellaneous	1.4819	1.14094	8
17. Chemical industry, pharmacy and traditional medicine	1.3449	1.03545	16
18. Rubbers, rubber-based goods and plastics	1.5089	1.16175	7
19. Non-metal quarrying industry	1.4363	1.10580	10
20. Basic-metal industry	1.3508	1.03995	15
21. Metal-based goods, computers, electronics, opticals and electrical equipments industry	1.5797	1.21622	2
25. Electricity, gas supply, ice production, water supply, waste processing and recycling	1.5497	1.19311	5
26. Construction	1.4454	1.11284	9
28. Railway transportation	1.4031	1.08025	11
29. Land transportation	1.3984	1.07660	12
30. Water-crossing transportation	1.3549	1.04318	14
32. Catering and accomodation provider	1.5349	1.18169	6
Total	1.4710	1.1326	

Source: BPS Sumatera Selatan, 2014

Table 5: Ranks of leading economic sectors by sensitivity degrees index in 2014

Sector	Degree of sensitivity		Ranking
	Quanty	Index	
3. Plantation	1.4684	1.1305	8
5. Forestry and Logging	1.3130	1.0109	13
7. Petroleum, Gas and Geothermal Mining	3.2785	2.5241	1
8. Coal and Lignite Mining	1.4293	1.1004	10
10. Other Mining and Quarrying	1.4620	1.1256	9
11. Coal and Petroleum Refinery Industry	2.5495	1.9629	2
12. Foods and Drinks Industry	1.3544	1.0428	12
16. Paper and Pulp, Printing and Recording Media Reproduction Industry	2.1018	1.6182	3
17. Chemistry, Pharmacy and Traditional Medicine Industry	1.4182	1.0919	11
18. Rubbers, Rubber-based Goods and Plastics	1.4692	1.1312	7
27. Car and Motorcycle Trading, Repairations, Non-vehicle Products Groceries and Retails	1.8007	1.3864	4
33. Informations dan Communication	1.5239	1.1733	5
34. Financing, Insurance, Pension and Other Financial Services	1.5126	1.1646	6
Total	1.7447	1.3433	

Source: BPS Sumatera selatan 2014

Table 6: 10 output growth trigger-leading sectors in South Sumatera province

Code	Sectors	Output multiplier
11	Coal and petroleum refinery industry	1.6658
21	Metal-based goods, computers, electronics, opticals and electrical equipments industry	1.5797
12	Foods and drinks industry	1.5663
4	Livingstocks farming	1.5548
25	Electricity, gas supply, ice production, water supply, waste processing and recycling	1.5497
32	Catering and accomodation provider	1.5349
18	Rubbers, rubber-based goods and plastics	1.5089
15	Woods, wooden and styrofoam-based goods, bamboo and rattan woven goods and miscellaneous	1.4819
26	Construction	1.4454
19	Non-metal mining industry	1.4363

Source: Processed from South Sumatera I-O Table 2014

Table 7: 10 labor income-trigger leading sectors in South Sumatera province

Code	Sectors	Income multiplier
36	Government administration, national defense and mandatory social security	0.9524
37	Education, health and social activity services	0.4285
28	Railway transportation	0.3640
34	Financing, insurance, pension and other financial services	0.2734
10	Other mining and quarrying	0.2577
3	Plantation	0.2321
38	Other services	0.2190
8	Coal and lignite mining	0.2106
16	Paper and pulp, printing and recording media reproduction industry	0.2044
26	Construction	0,1994

Source: Processed from South Sumatera I-O Table 2014

The economic sectors above illustrate the amount of output multipliers that can be created if there is a change in investment of 1 unit. Suppose there is an investment of Rp. 1,0000,00.000, - (1 billion rupiah) in each sector, it will create output of coal industry sector and refinery of oil and gas equal to Rp. 1,665,841.028, Industrial sector output of goods from metals, computers, electronic goods, optics and electrical equipment Rp. 1,579,697,948, -, creating output of food and beverage industry sector at R 1,566,304,611 and so on.

Table 8: 10 labor-absorber leading sectors in South Sumatera province

Code	Sector	Labor multiplier
38	Other services	0.1074
3	Plantation	0.0318
4	Livingstocks farming	0.0209
1	Crops farming	0.0177
5	Forestry and logging	0.0176
6	Fishery	0.0163
28	Railway transportation	0.0156
2	Holticultural crops	0.0156
27	Car and motorcycle trading, repairations, non-vehicle products groceries and retails	0.0136
32	Catering and accomodation provider	0.0132

Source: South Sumatera I-O Table 2014

5.1.3. Analysis of Labor Income Trigger Leading Sectors

If the provincial government of South Sumatra intends to increase the income of households (pro-poor), then the 10 leading economic sectors that can be developed in Sumsel Province are the following economic sectors that showed in Table 7:

The economic sectors above illustrate the amount of the income multipliers that can be created if there is a change in investment of 1 unit. Suppose there is an investment of Rp. 1.000.000.000, - (1 billion rupiah) in each sector, it will create total labor income of government administration, defense and Social Security Sector is Rp. 952,381,578, creating labor income of education services & health services and social activities of Rp. 428.453.862, -, creates railway labor income of Rp. 363,967,469, and so on.

5.1.4. Labor-absorb leading sectors

The direction of economic transformation, when considering the creation of employment (pro-jobs), then the 10 main sectors that can be developed in the Province of South Sumatra are the following economic sectors in Table 8:

The direction of economic transformation of South Sumatra Province if the pro-job or job creation, the other services sector, Plantation, Livingstock Farming, Food Crops, Forestry and Logging, Fisheries, Rail Transportation, Horticultural Crops, Car and Motorcycle Trading, Repairations, Non-vehicle Products Groceries and Retails, and Cateirng and Accomodation Provider are 10 sectors that can absorb the most productive workforce in South Sumatera Province. If the final request expenditure such as investment increases by Rp. 1,000,000.000, - (1 billion rupiah) in each sector of the other services sector, Plantation, Livingstock Farming, Food Crops, Forestry and Logging, it can create employment of 107.4 workers in other Services, 31.8 workers in the plantation sector, absorbed 20.9 workers in the livestock sector, absorbed 17.7 workers in the food crop sector, absorbed 17.6 workers in the Forestry and Logging Sector, absorbed 16.3 workers in the fisheries sector, absorbed 15.6 workers in rail transport, absorbed 15.6 workers in the holticultural crop sector, absorbed 13.6 workers in the trade sector of automobiles, motorcycles and repairs and large and retail trade, not cars and motorcycles, and absorbed 13.2 workers in the sector of accommodation and drinking provision in South Sumatera province.

6. CONCLUSION AND POLICY RECOMMENDATIONS

6.1. Conclusion

The results of this study can be concluded that there are 10 leading economic sectors that have the distribution power, namely: (1) Coal Mining and Petroleum Refinery Industry; (2) Metal-Based Goods, Computers, Electronics, Opticals and Electrical Equipment Industry; (3) Foods and Drinks Industry; (4) Livingstock Farming; (5) Electricity, Gas Supply, Ice Production, Water Supply, Waste Management and Recycling; (6) Catering and Accomodation Provider; (7) Rubbers, Rubber-based Goods and Plastics Industry, (8) Woods, Wood-based Goods, Bamboo and Rattan Woven Good and Miscellaneous; (9) Construction; (10) Non-Metal Goods Industry.

10 leading sectors with high sensitivity means that the sector has a strong forward linkage compared to other sectors (1) Oil, Gas and Geothermal Mining; (2) Coal, Gas and Petroleum Refinery; (3) Paper, Pulp, Printing and Recordings Media Reproduction Industry; (4) Car and Motorcycles Trading, Repairations, Groceries, Retails and Non-vehicle Products; (5) Information and Communication; (7). Rubbers, Rubbebased Goods and Plastic-based Goods Industry; (8) Plantation; (9) Other Mining and Quarrying; and (10) Coal and Lignite Mining.

10 Sector in the sector of growth-trigger in South Sumatera Province are (1) coal industry sector and oil and gas refinery; (2) Industrial Goods of Metals, Computers, Electronic Goods, Optics and Electrical Equipment; (3) Food and Beverage Industry; (4) Animal Husbandry; (5) Electricity & Gas Procurement and Ice Production & Water Supply, Waste Management, Waste and Recycling; (6) Provision of Accommodation & Provision of Drinking; (7) Rubber Industry, Rubber and Plastic Goods; (8) Wood Industry, Wood and Cork Goods and Bamboo Goods from Bamboo, Rattan and the like; (9) Construction; and (10) Non-Metal Products.

10 leading sectors of Manpower Revenue in South Sumatera Province are (1) Mandatory Government, Defense and Social Security Administration; (2) Education Services & Health Services and Social Activities; (3) Rail Transport; (4) Financial Brokerage & Insurance Services and Pension Fund and Other Financial Services and Financial Support Services Company Services; (5) Other Mining and Quarrying; (6) Plantation; (7) Other services; (9) Paper and Paper Industry, Printing and Reproduction Media Recordings; and (10) Construction.

The top 10 sectors absorbing the largest labor force in South Sumatra Province are (1) Other services; (2) Plantation; (3) Animal Husbandry; (4) Food Crops; (5) Forestry and Logging; (6) Plantation; (7) Fisheries; (8) Rail Transport (9) Automobile, Motorcycle and Reparations Trade & Wholesale and Retail Trade, Not Cars and Motorcycles; and (10) Provision of Accommodation & Provision of Drinking Water.

6.2. Recommendations Direction of Local Government Policy of South Sumatera Province

From the results of the research, the policy recommendations for the government of South Sumatra Province are:

1. Encourage increased investment in 10 leading sectors that have high distribution power so that it can be a sector that can provide maximum output growth rate in South Sumatera Province.
2. Encourage increased investment in sectors that have high sensitivity to encourage other sectors to increase output.
3. The direction of economic transformation of the Provincial Government of South Sumatra should ignore the formation of economic growth (pro growth), by encouraging increased investment in sectors that can trigger economic growth in South Sumatra Province.
4. The direction of the economic transformation of the Provincial Government of South Sumatera should pay attention to the increase of household income (pro poor) by encouraging the increase of investment in the leading sector which is able to spur the increase of sectoral employment income in South Sumatera Province.
5. The direction of the economic transformation of the Provincial Government of South Sumatra should ignore the absorption of labor (pro job) by encouraging the increase of investment in the sector of superior sector which is able to absorb the maximum work force in South Sumatera Province.

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