Analysis Of Leading Industrial Sector In Accelerating Inclusive Economic Growth In Lampung Province

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ABSTRACT

This study aimed at analyzing the leading industrial sector and the role of the leading industrial sector towards the acceleration of inclusive economic growth. This research utilized input-output analysis. It utilized backward linkage and forward linkage to determine the leading industrial sectors, and applied output multiplier analysis, labor multiplier and income effects to see the inclusiveness effect of the leading industrial sectors. The results of the study showed that Wood industry: Wood and Cork Goods, Woven Goods from Bamboo, Rattan etc., as well as other Processing Industries: Repair Services and Machinery and Equipment Installation Services were the leading industrial sectors which had an impact on accelerating inclusive economic growth in Lampung Province.

Keywords: Lampung, Leading sector, Inclusive, Growth, Industry, Input-output analysis

1. INTRODUCTION

World Bank [1] defines inclusive development as a condition of increased growth rates and expansion of economies of scale, creation of investment fields and equal employment opportunities. Mckinley [2] states that there are 2 indicators of inclusive growth. The first one is that achieving sustainable growth will create and expand economic opportunities and further ensure wider access opportunities so that people can participate and benefit from the growth.

Each international organization has different concepts of inclusive growth. Indonesia through the Indonesia Development Forum 2018 agreed on an inclusive economic development index. There are three indicators of inclusive economic growth: economic growth, income distribution and poverty reduction [3].

Economic growth is closely related to industrialization. Industrialization is the process of processing raw materials into semi-finished or finished goods from which the value of the goods increases. Industrialization is a continuation of the primary sector economy. It is very important to increase the economic growth. Tambunan [4] points out that industrialization is not a final goal, but it is one of the strategies that can be used to achieve high growth rates.

The main purpose of this paper is to analyze how the influence of the leading industrial sector on inclusive economic growth. In general, the objective of the leading industry sector analysis is to see which industry sector has the greatest effect on accelerating inclusive economic growth. The second part of this paper presents the research methods and data used in this study. The third part analyzes the input-output table to determine the leading industrial sector and the impact of the leading industrial sector on the acceleration of inclusive economic growth.

Conclusions and policy recommendations are presented in sections four and five.

2. RESEARCH METHODOLOGY

This paper employs input-output table of Lampung Province in 2010 released by Central Bureau of Statistics (CBS) Lampung Province. The input-output table consists of 53 economic sectors. The input-output table analysis is one of the general equilibrium models introduced by Leontief in the 1930s[5].

Table 1. Input-Output Table

Output Allocation / Input Arrangement		Production Sectors (Xn)				Final Demand	Total Output
		1	2	..	N.		
Production Sectors (Xn)	1	X_{11}	X_{12}	..	X_{1n}	F_1	X_1
	2	X_{21}	X_{22}	..	X_{2n}	F_2	X_2
	3	X_{31}	X_{32}	..	X_{3n}	F_3	X_3
	...	...	...	..	.	...	...
	N	X_{n1}	X_{n2}	..	X_{nn}	F_n	X_n
Primary Input		V_1	V_2	..	$Vn.$		
Total Input		X_1	X_2	..	$X_n.$		

Source: Miller (1985)

The input-output table presents information related to transactions of goods and services between sectors in an economy of a region presented in the form of a matrix. There are 3 quadrants in the input-output table [6] of Lampung Province. Quadrant 1 is an intermediate transaction, quadrant 2 is the final request, and quadrant 3 is the primary input. Values in line show the supply of goods and services used as input to other sectors (Xn) and final demand (Fn). The values in column indicate the use of intermediate inputs (Xn) provided by other sectors, and primary inputs (Vn). The input-output table is a general equilibrium model, so the value of total inputs will be the same as the value of the total output of each sector.

The basic relationship of the input-output table is shown in the following equation:

$$X = (I - A)^{-1} F$$

…Eq (1)

Where $(I - A)^{-1}$ is called the Leontief Reverse Matrix. This matrix contains important information about inter-sectoral linkages. Since each sector has different linkages, the impact of changes in the production of a sector on the total production will also vary.

1.1. Analysis of Linkage

Rasmussen [7] uses the total columns and rows of the Leontief Reverse Matrix to measure relations between sectors both directly and indirectly. This indicator is referred to as backward linkage (BL) and forward linkage (FL). Backward index and forward linkage can be referred to as input and output multiplier. If each index has a value ≥ 1, there is a high relationship between sectors, and if it is contradictory, then the relationship between sectors is low. This index is referred to as the Hirschman-Rasmussen index. A high index value for both in a sector shows that the sector can be considered as a leading sector.

$$BL_j = \frac{\sum_{j=1}^{n} b_{ij}}{\frac{1}{n}\sum_{i=1}^{n}\sum_{j=1}^{n} b_{ij}}$$

… Eq (2)

$$TFL_j = \frac{\sum_{i=1}^{n} b_{ij}}{\frac{1}{n}\sum_{i=1}^{n}\sum_{j=1}^{n} b_{ij}}$$

… Eq (3)

1.2. Analysis of Inclusivity

Inclusive economic growth is a condition where there is an increase in economic activity, increased employment opportunities and increased income of the community [8]. Economic activities, employment opportunities and income can be seen using the output multiplier analysis, labor multiplier and income effect. The output multiplier aims to see the impact of changes in the final demand of a sector on the economy as a whole. Miller and Blair [9] affirm that an increase in overall output is created due to

the direct effects and indirect effects of an increase in the final demand of a sector.

$$\Delta X_j = (I - A)^{-1} \Delta F_j$$

… Eq (4)

Labor multiplier aims to see the role of a sector in providing employment opportunities in the economy due to changes in final demand.

$$\Delta E = \hat{L}(I - A)^{-1} \Delta F_j$$

… Eq (5)

The Income Effect aims to see the role of a sector in increasing overall community income due to changes in final demand.

$$\Delta M = \hat{V}(I - \bar{A})^{-1} \Delta F_j$$

… Eq (6)

A sector is considered to be able to encourage inclusive economic growth if it has a positive value from each analysis.

2. RESULT AND DISCUSSION

This analysis consists of 2 parts. The first part determines the leading industrial sector and the second part finds out the influence of the leading industrial sector in driving inclusive economic growth through an analysis of output multipliers, labor multipliers and income effects.

2.1. Determination of Leading Industrial Sectors

Leading sector is a sector that has strong linkages with other sectors [10]. Linkages between sectors can be seen from the value of backward linkage and forward linkage of each sector. The value of backward linkage indicates the ability of a sector to absorb the output of other sectors in its production activities, while the value of a forward linkage indicates the ability of a sector to encourage the growth of other sectors by using the input of the sector as raw material for production. Sectors that have high backward linkage and forward linkage values are categorized as leading sectors. Table 2 shows the values of the industrial sector backward linkage and forward linkage in the input-output table.

The results of data processing showed that from 16 industrial sectors, there were 5 industrial sectors that had high backward linkage value and low forward linkage value. There were 6 industrial sectors that had low backward linkage value and high forward linkage value. In addition, there were 2 industrial sectors which had low backward linkage and forward linkage values of 2 sectors. Based on these results, sector 17 (Wood Industry, Wood and Cork Goods and Woven Bamboo, Rattan, etc.), sector 23 (Metal, Computer, Electronic, Optical and Electrical Equipment Industry) and sector 27 (Manufacturing Industry Others, Repair and Installation Services of Machinery and Equipment) were categorized as the leading industrial sectors in the economy of Lampung Province. As an additional result from Table 2, we

provided information regarding the structure of inputs and outputs of the leading industrial sectors. The input structure contained information related to the composition used for production activities, while the output structure presented information related to output flow. Table 3 showed the input and output structure of the leading industrial sectors.

Table 2. Backward Linkage dan Forward Linkage Industrial Sector

Sectors	BL	FL
12	1,022684	0,989657
13	1,088755	0,646077
14	0,952271	0,628303
15	1,023864	0,621128
16	0,725313	0,611886
17	1,219337	1,042967
18	0,967634	1,449283
19	0,927789	1,246207
20	0,968759	1,01143
21	0,901175	1,020329
22	0,924166	1,254265
23	1,043991	1,183751
24	0,975642	1,25702
25	1,151565	0,622129
26	1,133615	0,888265
27	1,169212	1,422449

Source: Authors' calculation (2020)

Table 3. Input And Output Structure Of The Leading Industrial Sectors.

Sector	Input Structure				Output Structure		
	xi	I	W	BS	xj	C	E
17	47%	23%	8%	18%	55%	3%	38%
3	32%	16%	18%	21%	88%	5%	6%
7	44%	22%	13%	16%	83,5%	0,5%	16%

Source: Authors' calculation (2020)

Table 3 showed the input structure used for leading industrial sector production activities. Components used for production included intermediate inputs (xi), import inputs (I), wages (W) and business surpluses (BS). For intermediate input components, the industry that absorbed

the most output of other sectors in its production activities was sector 17, where this sector utilized raw materials sourced from other sectors totalling 47% of its total production. The components of imported inputs were raw materials originating from outside the region used in the production process. The sector that used the largest composition of imported raw materials in its production activities was sector 17, where this sector utilized 23% of the production component from imported goods. The wage component was the value of labor used in the production process. Sector 23 was the largest sector that used wage components in its production that was 18%, while sector 17 only used 8% in its production activities. Business surplus was a component of production in the form of value from the capital owner. The sector that had the biggest business surplus component in its production was sector 23, where this sector included 21% in its production activities.

The output structure of leading industrial sector showed the percentage of the output distribution of the leading industrial sector. The components used to view the distribution were intermediate output (xj), household consumption (C) and exports (E). The sector whose output was most used as raw material for other sectors was sector 23 with 88% of its production used as raw material for other sectors. The comparison of household consumption and exports indicated the amount of output of leading sectors consumed within and outside the region. Table 3 showed that all leading sectors were export-based leading sectors, where sector 17 was the sector whose output was the most consumed outside the region.

2.2. Analysis of Inclusive Effects

Inclusive growth is a condition where there is an increase in economic activity, the growth of employment opportunities and the growth of income. Increased economic activity can be seen from the value of the output multiplier, the growth of employment opportunities can be seen from the value of the labor multiplier, and the growth of income can be seen from the value of the income effect. Table 4 shows the values of the output multiplier, labor multiplier and income effect.

Table 4. Inclusive Effects of Leading Industrial Sector

Sector	Output Multiplier	Labor Multiplier	Income Effect
17	1,681	0,186	0,266
23	1,439	0,247	-0,088
27	1,612	0,224	0,123

Source: Authors' calculation (2020)

The results of the calculation showed that the industrial sector which gave the greatest influence on the economy as a whole and additional income for the community was sector 17, while the sector that provided the most employment opportunities was sector 23. The sector that had an inclusive effect was the sector which all analyzes

had a positive value. Sector 23 was a leading industrial sector, but its growth did not provide an inclusive effect since it had a negative income effect value. Based on the results of the study, Wood industry: Wood and Cork Goods, Woven Goods from Bamboo, Rattan etc., as well as other Processing Industries: Repair Services and Machinery and Equipment Installation Services were the leading industrial sectors which had an impact on accelerating inclusive economic growth in Lampung Province.

3. CONCLUSION

This research was conducted to examine the leading industrial sector and its impact on inclusive economic growth through input-output analysis. Backward linkage and forward linkage analyzes were carried out to determine the leading industrial sectors. After the leading industry sector was determined, then the output multiplier, labor multiplier and income effect analysis were performed to see the inclusiveness of the leading industrial sector. Equipment was a leading industrial sector that provided an impact of inclusiveness on the economy in Lampung Province. The input-output table used in this study was the input-output table of Lampung Province in 2010 which was the last input-output table released by the Lampung Province government.

Lampung Province is an area whose economy is still dominated by agriculture, forestry, plantation and fisheries sectors. This strong dominance by the primary sector had encouraged the researchers to analyze the leading industrial sectors that could encourage inclusive economic growth and industrialization which were expected to increase the value of the primary sector.

Our analysis showed that Wood industry: Wood and Cork Goods, Woven Goods from Bamboo, Rattan etc., as well as other Processing Industries: Repair Services and Machinery and Equipment Installation Services were the leading industrial sectors which had an impact on accelerating inclusive economic growth in Lampung Province.

4. POLICY IMPLICATION

The findings of this study have important policy implications. Special attention by the regional government of Lampung Province is needed to be able to encourage the growth of the Wood industry: Wood and Cork Goods, Woven Goods from Bamboo, Rattan etc., as well as other Processing Industries: Repair Services and Machinery and Equipment Installation Services. Both are leading industrial sectors that can encourage inclusive economic growth in Lampung Province. Both of these industries are industries that absorb a lot of other sector inputs in the production process and the output of this sector is widely used as raw material for other sectors. Thus, encouraging the growth of the leading industrial sector not only increases the output of the sector but also increases overall output in the economy. These two leading industrial

sectors also have an effect on an inclusive economy. It indicates that the growth of the leading industrial sector not only benefits the capital owners, but also provides benefits to society as a whole. The policy that can be taken by the government is to facilitate the investment process and make promotions to investors, so they are interested in investing in the two leading industrial sectors. The additional investment in the leading industrial sector is expected to encourage the growth of leading industries and the economy as a whole.

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