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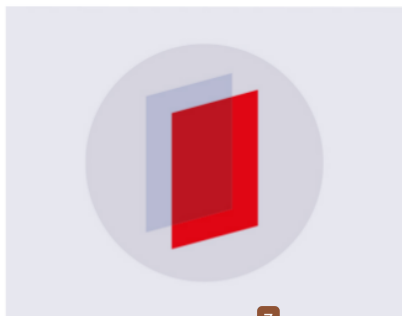
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8 **Priority economic sector and household income in Indonesia (an analysis of input output)**

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Abstract. This purpose of study aims to identify the roles of priority economic sectors on household incomes in Indonesia. Analyse in this paper used nine economic sectors, that representing result classification from input output table. This study found that (1) priority economic sector are manufacturing sector & trade hotel and restaurant; (2) sector that have looking forward orientation included agriculture, mining & quarrying, and financial ownership & business services; and (3) electricity, gas, and water supply sector give the biggest impact to household income in Indonesia. The suggestion that policies aimed at increasing productivity and raising skills while encouraging individual participation in the formal labour market are essential.

1. Introduction

Economic development needs to pay attention to the development of every sector in the economy. The development of the economic sector could have an impact on increasing output although it does not necessarily reflect the equitable distribution of people's income and job opportunity. Thus, the determination of priority economic sectors is important as the development of this sector is expected to increase income distribution and provide employment. Thus, the priority economic sector needs to get attention because this sector has a strong foundation to support the economic activity [1]. The priority economic sector is a community activity, either in the form of outward-oriented goods or services, in other words, the sector must be export oriented sector to other regions, otherwise the economic sector is not to be the imported sector's, in other words, all products (goods and services) came from other regions [2,3].

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The purpose of this paper is to know the priority economic sectors and the role of the sector on household income so that the development of this sector is expected to reduce unemployment, to increase the number of laborforce, and to improve the welfare of the community. This paper focuses on the case of the Indonesian state and uses the input output analysis approach as an analytical instrument.

2. Methods

2.1. Data

The data sources in this paper came from Indonesia's input output data in 2008. This data published by the Central Bureau of Statistics. The use of data is expected to capture the changes occurring along this periods as well as to know the impact of a priority sector on household income. The data are classified into 10 sectors. These are agriculture, other crops, forestry and hunting; mining & quarrying sector; manufacturing industry sector; electricity gas and water supply; construction; trade, hotel and restaurant; transportation sector; communications sector; financial, ownership, & business services; and services sector.

2.2. Input output method

W. Leontief first introduced the Input-Output Table, commonly called as Table I-O, in the 1930s. Table I-O is a table that provides information about transactions of goods and services that occur between production sectors within an economy. It's presented in the form of a matrix [2,8]. The data in table I-O shows trade relationships between sectors within a country's economy. Each line shows the number of sales from a sector. Since a sector does not sell its goods to an existing sector, it is common to find zeros in a row in table I-O. The columns in the I-O table record purchases made by a sector on goods and services produced by various sectors within the region. If the numbers within the columns of a sector are numerous zeros, this is because a sector does not always buy goods and services from all sectors in the country's economies [3,5,6,8]. The simplest form of the I-O table is shown in Table 1.

Table 1. Simple Form for Input Output Table

Seller Sector	Buyer Sector				Final Demand	Total Production
	1	2	...	n		
1	X ₁₁	X ₁₂	...	X _{1n}	f ₁	X ₁
...
N	X _{n1}	X _{n2}	...	X _{nn}	f _n	X _n
Value Added	V ₁	V ₂	...	V _n		
Import	M ₁	M ₂	...	M _n		
Total Input	X ₁	X ₂	...	X _n		

From Table 1, we can made two balanced balance equations:

Row:

$$\sum_{j=1}^n x_{ij} + f_i = x_i; \forall i = 1, 2, 3, \dots, n \tag{2.1}$$

Column:

$$\sum_{i=1}^n x_{ij} + v_j + m_j = x_j; \forall j = 1, 2, 3, \dots, n \tag{2.2}$$

Where x_{ij} is the flow of goods and services from sector i to sector j ; F_i is the total final consumption; V_j is value added; and M_j is import. The definition of a balanced balance is the amount of production equal to the number of inputs. The flow can be transformed into coefficients by assuming that the number of purchases is fixed for a total output level and there is no possibility of substitution between

an input feed and another input material. From both equations we can constructed coefficient as follows:

$$a_{ij} = x_{ij} / x_j \tag{2.3}$$

or

$$x_{ij} = a_{ij} x_j \tag{2.4}$$

with substitute equation (2.4) to (2.1), we get :

$$\sum_{j=1}^n a_{ij} x_j + f_i = x_i; \forall i = 1, 2, 3, \dots, n \tag{2.5}$$

From equation (2.5), we have basic relationship in IO Table as follows:

$$(I - A)^{-1} f = x \tag{2.6}$$

Notation $(I - A)^{-1} f = x$ is named as Leontief's inverse matrix. This matrix provides important information on how increased production of a sector will lead to the development of other sectors. Because each sector has a different pattern, then the impact of a sector's production changes on the total production of other sectors will be different. The Leontief matrix summarizes the entire impact of a sector's production change on the total production of another sector into a coefficient. It's often known as multipliers [4,5,18]

Since the purpose of this paper is to calculate the impact of the priority economic sector on household income, it is necessary to know the value of the income multiplier which is the amount of income created by the increased demand for sector j output by 1 unit. The income multiplier calculation formula as follows:

$$H_j = \sum_{i=1}^n v_{ij} \Pi_i \tag{2.7}$$

where H_j is the income multiplier sector j; $(I - A)^{-1}$ is Leontief's inverse matrix; and Π_i is the income coefficient. The income coefficient can be calculated by dividing the total revenue of sector i by output from sector i.

Determination of priority economic sector in the analysis of input output obtained by calculating the linkage index. The value of this linkage index consists of two types : forward and backward linkages. The priority economic sector is determined by the value of both indexes greater than one. The calculation of linkage index as follows:

$$L_j = \frac{\sum_{i=1}^n a_{ij}}{\sum_{i=1}^n \sum_{j=1}^n a_{ij}} \tag{2.8}$$

Where L_j is the linkage index of an economic sector; a_{ij} is the input coefficient between sector j derived from sector i.

3. Result and discussion

Based on Table 2, the value of the forward linkage index shows that the manufacturing industry sector has the highest value followed by the agriculture sector. While the sector with the lowest value is the communications sector. The value of forward linkage index is 2.013 for the manufacturing industry sector and 1.038 for the agricultural sector. This value indicates that both sectors have a strong ability to drive output growth in downstream industry. In addition, the output generated from both sectors is the intermediate output, then the output can be a raw material for industry or other economic sectors [1,2,6].

Next, from the value of the backward linkage index, it can be seen that the electricity, gas and water supply sectors have the highest value, then followed by the construction sector. While the sector with the low value is the mining and quarrying sector. The value of backward linkage index is 1.190 for the electricity, gas and water supply sector and 1.159 for the construction sector. This value indicates that the sector has a strong ability to encourage the growth of the upstream sector as each increase in one unit to the final demand will encourage an increase in output for this sector if it's used as an input.

Based on the two values of the linkage index, the priority economic sector can be determined if the value of the two indexes is greater than one. We show that the manufacturing industry sector and the trading hotel and restaurant have both indexes greater than one. So, both sectors can be the priority economic sectors. The development of priority sectors of the economy in the long run can encourage the growth of other sectors in an economy so it is expected to create sustainable growth [1].

Table 2. Forward and Backward Linkage

Sector	Backward	Forward
Agriculture	0.869	1.038
Mining and Quarrying	0.764	1.006
Manufacturing Industry	1.090	2.013
Electricity, Gas, & Water Supply	1.190	0.755
Construction	1.159	0.742
Trade, Hotel, and Restaurant	1.075	1.005
Transportation	1.125	0.817
Communication	0.803	0.732
Financial, Ownership, & Business Services	0.896	1.037
Services	1.029	0.855

Based on Figure 1, the results of income multipliers show that the electricity gas and water supply sector has the greatest value when compared to other sectors. Then, it has followed the mining and quarrying sector and the agriculture sector. For the smallest income multipliers is the transportation sector. The multiplier value of electricity gas and water supply sector is 0.743, this value indicates that every increase of one-billion-rupiah output was generated from this sector, then the total income of the community will increase by 743 million rupiah. Next, the multiplier value of transportation sector is 0.299, this value indicates that every increase of one-billion-rupiah output was generated from this sector, then the total income of the community will increase by 299 million rupiah. This finding suggests that it is possible that the high-income multipliers generated from the electricity gas and water supply sector come from the contribution of priority economic sectors. Where the priority economic sector is a collection of activities that are expected to create employment opportunities and increase revenues in the sector that this sector can be the foundation of an economy [7].

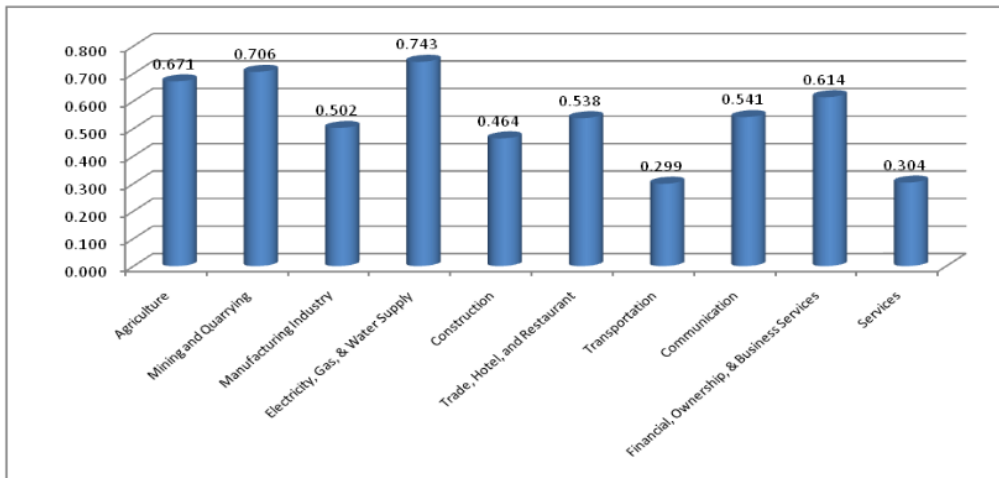


Figure 1. Income Multiplier

From our findings, we must be careful if the investment is focused on priority economic sector only i.e manufacturing and trade hotel and restaurant. However, we do not pay an attention about both sectors have a smaller income multiplier contribution than other sec²¹ that not include in priority economic sector i.e agriculture, financial financial, ownership, & business services, mining and quarrying, and electricity gas & water supply [9]. There are some arguments, for example that agricultural sectors in LDCs have few income linkage effects eventhough sectors which generate significant income and employment for each unit increase in final demand are mainly agricultural sub-sectors. Thus, the conclusion from this view point that "agricultural sector is not capable of generating significant household" is not correct. From table and figure have shown above, makes it possible to compare different economic sectors in terms of their contribution to economic and household income. The results of this compar⁵n should have brought up an interesting results: agriculture, mining and quarrying, manufacturing, trade, hotel and restaurant, and financial, ownership, & business services, are those that have contemporaneous contribution to economic and household income growth and thus must be given priority in any " growth and household income-oriented " development plan [10].

4. Conclusion

Accord¹⁶ to the analysis and findings, this study found that (1) priority economic sector during this period are manufacturing sector & trade hotel and restaurant sector; (2) sector that have looking forward orientati⁵n included agriculture, mining & quarrying, and financial ownership & business services; and (3) electricity, gas, and water supply sector give the biggest impact to household income in Indonesia. The suggestion that can be given, (1) the Indonesian government should push the activities of national economy with concern in priority economic sector; (2) the policies aimed at increasing productivity and raising skills while encouraging individual participation in the formal labor market are essential.

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