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CONTRIBUTION OF AGRICULTURE SECTOR ON ECONOMY IN CENTRAL JAVA (ANALYSIS INPUT-OUTPUT)

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Abstract

This study aims to look at how the contribution of agricultural sector to the economy in Central Java is seen from the analysis of interrelation, distribution and multipliers. The analysis used was Input-Output in 2013 using data from BPS in Central Java. The results in the analysis of the linkages of the agricultural sector have contributed to the forward and backward linkages, in the analysis of the spread only forward distribution which shows good results not with the backward spread, which means the agricultural sector is more helpful to the downstream of other sectors than its upstream, while the results of the analysis of the multipliers of the agricultural sector contribute more to the sector in the economy towards increasing output rather than increasing income.

Keywords: agriculture sector, spread analysis, linkage analysis, multiplier analysis, input-output

1. Introduction

The economic development of a country is able to support through various sectors, one of them is the agricultural sector. According to (Todaro, 2006) development is a concept that structured and planned systematically, which aims to create a new atmosphere and system. One of the goals of economic development is to create a society that can create justice and prosperity whose felt by all levels of society in accordance with the economic capacity and capability of a region in producing goods and services for the needs of the community (Oktavia et al, 2016).

That system then provide the conditions for the development of values in people's lives. As a country with a middle economic level, Indonesia is included in the category of a third world country, so that development in Indonesia cannot be separated from the agricultural sector (Emalia, 2018). The agricultural sector is the base sector in Indonesia because it has abundant resources, so this sector plays a major role in the economy in Indonesia, especially in terms of its contribution to other sectors (Perwitasari et al., 2013). From that case, the agricultural sector is able to assist in regional economic development by creating (Arsyad, 2011).

The importance of the agricultural sector in Indonesia also impacted in Central Java because it is one of the national food producer provinces, especially agricultural productivity is prioritized to continue (BPS Central Java, 2014). Many capabilities of the agricultural sector can be seen in more detail with the backward linkage and forward linkage in addition to direct contributions. In

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the analysis of the relationship between these sectors, there are two kinds of indexes, namely the dispersion power index and the index of the degree of sensitivity.

These two indices are able to see which sectors are capable of supporting economic growth and have high sensitivity. Sectors that have high added value do not necessarily have high dispersibility index and degree of sensitivity index. Sectors with high dispersion power index and sensitivity degree index are key sectors for regional economic development (Nazara, 2005). A sector also has an indirect contribution in the form of a multiplier effect, be it a multiplier effect on output and labor (Dwiastuti et al, 2008). So this paper aims to see how the contribution of the agricultural sector to economic development in terms of multiplier analysis, linkage analysis, and distribution analysis.

2. Method

Data used of this paper is secondary data from the 2013 Central Java Input-Output Table for Classification of 88 Sectors. The data from the Input-Output table are classified as 88 sectors, which are aggregated into 13 sectors. The analytical method used is an Input-Output analysis method that was first introduced by Professor Leontief from Harvard University (Yusuf and Tajerin, 2017). Input-output analysis is a comprehensive analysis of the regional economy because it looks at the linkages between economic sectors in the region as a whole (Kembawu and Sinay, 2015). This analysis can be divided into three, namely to know forward and backward linkages, distribution analysis, and to see the multiplier number of each sectors (Wijaya et al, 2014).

a. Linkage Analysis

Linkage analysis is used to see the relationship of a sector to other sectors. The magnitude of the influence of a sector is seen from the increase in the output of a sector in encouraging the output of other sectors as input providers or as output recipients from other sectors. Relationship analysis is divided into two, namely forward and backward linkage Cahyo (2014: 3).

Backward linkage analysis is used to see the ability of a sector to increase the growth of its upstream industry. The greater this figure, when the value is greater than one, shows the greater the direct backward linkage (Subanti, 2009). Meanhile forward linkage analysis shows the relationship between a sector and the downstream sector which is the user of the sector's output. This index of forward linkage is referred to as the total forward linkage index (IKFL). The IKFL figure that is greater than one indicates that the output of this sector is largely absorbed by other sectors and consumers in the economy (Malba, 2016). The formula are:

$$IKBLj = \frac{n\sum_{i=1}^{n} aij}{\sum_{i=1}^{n}\sum_{j=1}^{n} aij} \qquad IKFLi = \frac{n\sum_{j=1}^{n} aij}{\sum_{i=1}^{n}\sum_{j=1}^{n} aij}$$

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b. Deployment power analysis

This analysis consists of two compositions, namely the dispersion coefficient and the dispersion power index. The coefficient of dispersion or backward dispersion is the ability of a sector to increase its upstream industrial production Zaini (2004: 9). The dispersion analysis is divided into two, namely the dispersion power index or called backward spread and the degree of sensitivity index or forward spread.

This analysis of dispersion power index, which is the impact of changes in final demand in a sector on aggregate output. The dispersion power index comes from the normalized total backward linkage value by dividing the average Leontief inverse matrix (Rafiqah et al, 2018). Meanwhile the index degree of sensitivity, which is the impact that occurs on the output of a sector as a result of changes in final demand in each economic sector. The sensitivity degree index is derived from the normalized total forward linkages by dividing the average number of forward linkages by dividing the average Leontief inverse matrix. The formula are:

$$BLj = \frac{\sum_{i=1}^{n} \alpha ij}{1/n \sum_{i=1}^{n} \sum_{j=1}^{n} \alpha ij} \qquad FLi = \frac{\sum_{i=1}^{n} bij}{1/n \sum_{i=1}^{n} \sum_{j=1}^{n} bij}$$

3. Result

a. Linkage analysis

Direct and indirect backward linkages are the ability of an economic sector to encourage the growth of other sectors so that they are able to produce maximum output. This is done using either direct or indirect input requests. Each economic sector is added and then divided by the whole sector to get an average value. If an economic sector has a backward linkage value greater than the average value of all sectors, then that sector has a high backward linkage value.

The results in the Table 3.1 show the results of the direct, indirect and total backward linkages. Overall, the total linkage of the agricultural sector is 1.202 which indicates (>1) that the agricultural sector has a role in increasing the output of other sectors, however, when compared to the average of other sectors the value is 1.409. The results of the agricultural sector are still below average so that the agricultural sector is less influential in helping the output of other sectors. This may be because the agricultural sector is the beginning or the upstream of all economic sectors.

For forward linkage is the ability of a sector to be able to drive growth in the total output of the economy as a whole. This can be done through the distribution of the output either directly or indirectly. If a sector has a forward linkage value that is more than the average figure for the entire sector, then that sector has a high forward linkage value.

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The results in Table 3.1 show that the agricultural sector has a total forward linkage value of 1.520 consisting of a direct value of 0.236 and an indirect value of 1.283. The results show that agriculture does not have a direct role in the economy of Central Java, so that the value of the direct forward linkage is less than one, namely 0.236. The role of agriculture in the economy of Central Java is more towards indirect future linkages. This is because the majority of farmers in Central Java produce raw materials. If agricultural production is not processed, it will only have a low selling value. Therefore, the production of the agricultural sector must be further processed through a processing so that it can attract consumers and increase the selling value.

Table 3.1
Linkage Analysis

Linkage	Dierct	Indierct	Total
Backward	0,149	1,053	1,202
Forward	0,236	1,283	1,520

Source: model simulation

b. Deployment power analysis

The backward distribution or distribution coefficient is calculated based on the number of sectors multiplied by the total linkages of each sector then divided by the total direct and indirect linkages of all economic sectors. The distribution coefficient is used to determine the total backward linkage of a sector to the entire sector. Through the input market mechanism, it is possible to know the distribution of the development of a sector against other sectors.

The role of agriculture economic sector towards the entire sector can be seen in Table 3.2. Sectors capable of influencing the activities of the entire economic sector in Central Java must be valued at more than one (>1) to show the high role given to other sectors. Meanwhile, the sectors that have a value of less than one (<1) indicate that these sectors are less influential in terms of attracting growth in upstream sectors.

However, the results show that the backward distribution of the agricultural sector is only 0.853 so that the agricultural sector is not able to attract the upstream sectors of the Central Java economy, this is in line with the results of backward linkages which indicate that the agricultural sector cannot help much in upstream growth to other sectors

Meanwhile the forward distribution or distribution sensitivity is calculated based on the total linkages per sector multiplied by the number of sectors then divided by the total linkages of all economic sectors. The use of this concept is to determine the value of the sensitivity of a sector to all sectors of the economy through the output market. In this case, the ability of a sector to produce output which is then used to push the output of its downstream sector.

Based on the results in Table 3.2, it is known that the value in the agricultural sector is 1.078, this indicates that the agricultural sector plays an important role in the downstream sector for other sectors. Agriculture can become an intermediary for other sectors such as the

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manufacturing and trade sectors because later output in the agricultural sector can be used as input for these other sectors.

Table 3.2
Deployment Power Analysis

Deployment power analysis	
Dispersion coefficient	0,853
Dispersion power index	1.078

Source: model simulation

4. Discussion

This paper discusses the contribution of the agricultural sector to the economy using the Input-Output Tables in Central Java. Using two analyzes, namely linkage analysis and distribution analysis. The results in the analysis of linkages both forward and backward produce results (>1) so that the agricultural sector can be said to be able to help input and output for other sectors.

In the distribution analysis, the distribution coefficient that focuses on backward linkages or the upstream sector has a value of less than one (<1) indicates that these sectors are less influential in terms of attracting the growth of the upstream sectors, while in the distribution sensitivity which focuses on forward linkages or the downstream sector results (>1) so that the agricultural sector plays an important role in the downstream sector for other sectors. Agriculture can become an intermediary for other sectors such as the manufacturing and trade sectors because later output in the agricultural sector can be used as input for these other sectors.

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