Structural Transformation of The West Java Economy and Its Agriculture

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Abstract. The role of the agricultural sector in economic development in West Java is not only seen from the production and employment, but also from its contribution to the formation of the GRDP. However, the development of economic growth in West Java has changed from year to year, including the agricultural sector where there is a shift in the share of output value which causes a decrease in the contribution of the agricultural sector without causing a decline in the value of output from the sector. This study aims to examine the shift in the agricultural sector in the economy in West Java. This study uses a quantitative descriptive method with secondary data in the form of national GDP data and West Java Province GDP according to business in 2013-2018 based on constant 2010 prices. The results of this study indicate that the growth of the agricultural sector in West Java is positively influenced by national economic growth. Growth in the agricultural sector is relatively slow and has no competitive advantage, with a change rate of 2.80 percent. In addition, the agricultural sector in West Java also does not specialize in location effects, except in the food crops and horticulture subsectors. Keywords: agriculture sector, shift share, transformation

1. Introduction

1.1. Research Background

The development of economic growth in West Java has changed from year to year. Changes that occur in addition to increasing economic growth, also in the form of sectoral shifts. Before knowing industrialization, science and technology, the contribution of the primary sector dominated the economy in West Java. But since the Industrial Revolution I took place in 1750 to 1850, began a sectoral shift from agriculture to non-agriculture or primary sectors to the secondary sector and the tertiary sector.

When the agricultural community becomes more advanced as a result of the industrial revolution, it should be able to make agriculture grow quickly because of the support of technology and innovation that can be adopted by the agricultural community. However, based on West Java's GRDP distribution data released by the West Java Central Statistics Agency from 1985 to 2015, we can see a sectoral shift in West Java where the agricultural sector (primary sector) tends to decline. In 1985, the tertiary sector dominated the economy of West Java by 39.80 percent, then the primary sector by 35.60 percent and the secondary sector by 24.60 percent, while in 2015 the secondary sector dominated the

economy of West Java with an acquisition of 52.12 percent, followed by the tertiary sector by 37.48 percent and the primary sector by 10.40 percent.

From this phenomenon it can be illustrated that at first, the primary sector especially the agricultural sector dominated the economy of West Java. But over time, the primary sector tends to decrease, while the secondary sector and tertiary sector tend to increase. However, from year to year, the increase in the tertiary sector tends to be slower than the increase in the secondary sector, so that in 2015 the secondary sector dominated the economy of West Java.

The pattern of movement of the primary sector is relatively in line with the theory of structural changes in the analysis model of the [1] development pattern, where the share of the GRDP of the primary sector has decreased, although not as sharp as the decline in the theory. But the pattern of movement of the secondary sector and tertiary sector is slightly different, where the pattern of the secondary sector moves to increase, then decreases and at the end of the period again shows an increase. Whereas in the theory of Chenery and Syrquin [1], secondary sector movements show increased movements which then move down. As for the tertiary sector, the GRDP share pattern showed an increase and at the end of the year it declined, whereas according to theory, the movement of the tertiary sector pattern showed an exponential increase.

Johnston, B. F.; Kilby, P. [2] also explained the structural transformation of the economy, that: Three conditioning factors are believed to be important for understanding the process of structural transformation in developing countries. The first is the simple fact of being late. The second is that agricultural development can only be fully understood in the context of interdependence between agriculture and other economic sectors. The final factor emphasized concerns the effect of the distribution of operational ownership sizes and the type of agricultural technology adopted in rural development patterns.

Agriculture which initially dominated the economy of West Java until now still has an important role in economic development, as stated by Rustiadi and Pranoto [3] that the agricultural sector is an important sector for economic development, because in addition to increasing GDP, the agricultural sector can also absorb workers who are not or less educated and skilled. Absorption of labor in the agricultural sector in West Java in 2018 occupies the third position with a total absorption of 2,869,492 people (13.81%) and occupies the fourth position in its contribution to the formation of the GRDP of 101,777.20 billion rupiah (7.17%) [4].

The agricultural sector has a contribution to development, especially in the area of West Java Province. Based on the RPJMD of West Java Province in 2013-2018, the agricultural sector is used as one way to achieve the success of regional development in the province of West Java. The potential of the agricultural sector can be seen from the area of land as follows:

Table 1. Land area based on the status of land in West Java

Land status	Luas (Ha)
Right of ownership	4633639
Cultivation Rights	2372
Building rights	1247096
Usage Rights	31898
Management Rights	370
Wakaf Rights	22003
Rights to Flats	54173
Total	6239322

Source : West Java Land Agency , [5]

Although the agricultural sector has considerable potential, the pace of development in the non-agricultural sector has resulted in a decline in the contribution of the agricultural sector to the GRDP and employment, among other things, due to many changes in the function of agricultural land to

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become non-agricultural. Therefore, this study of the transformation of the economic sector in West Java needs to be done.

1.2. Research purposes

This research aims to :

a. Describe the shift in the agricultural sector in its contribution to GRDP and employment.

b. Analyzing the shift in the agricultural sector in West Java through the shift share approach.

2. Research Methodology

This study uses secondary data in the form of GDP data of Indonesia and GRDP of West Java Province according to the field of business in 2013-2018 based on the basis of constant prices in 2010. The analytical method used through shift share analysis of the classical approach and modification of Esteban-Marquilas [6] and [7].

Soepono [8] suggested that shift share analysis is a technique that divides growth as a change (D) of a regional variable, such as employment, added value, income or output over a certain period of time into the effect of national growth (N), industry mix (M) and competitive advantage (C). According to Soepono [8] the general form of the equation from the Shift-Share analysis and its components used to analyze sector i in the study area j is formulated as follows:

$$D_{ij} = N_{ij} + M_{ij} + C_{ij}$$

where, D_{ij} = change in GRDP variable of reference sector i in the study area; N_{ij} = growth of the sector i reference area in the study area; M_{ij} = industry mix of sector i reference area in the study area; and C_{ij} = competitive advantage of the sector i reference area in the study area.

In this study, the GRDP is denoted as (E). From the above equation can be formulated as follows: follows:

$$N_{ij} = E_{ij}(r_n)$$
$$M_{ij} = E_{ij}(r_{in} - r_n)$$
$$C_{ij} = E_{ij}(r_{ij} - r_{in})$$

where, E_{ij} = sector i GRDP in the study area; r_{ij} = sector i growth rate in the study area; r_{in} = sector i growth rate in the reference area; and r_n = the rate of growth of all sectors in the reference area.

From this formula, can be defined as follows:

$$r_{ij} = \frac{E_{ij}^* - E_{ij}}{E_{ij}}$$

$$r_{in} = \frac{E_{in}^* - E_{in}}{E_{in}}$$

$$r_n = \frac{E_n^* - E_n}{E_n}$$

where, $E^*{}_{ij}$ = sector i GRDP in the study area at the end of the analysis year; E_{in} = GRDP sector i in the reference area; $E^*{}_{in}$ = sector i GRDP in the reference region at the end of the analysis year; E_n = Total GDP of all sectors in the reference area; and $E^*{}_n$ = Total GRDP of all sectors in the reference region at the end of the analysis year.

From the initial equation can be described as follows:

$$D_{ij} = E_{ij}(r_n) + E_{ij}(r_{in} - r_n) + E_{ij}(r_{ij} - r_{in})$$

In addition to being seen from the classical approach, this study will also look at the competitive advantage and specialization of an area with a shift-share modification from Estaban Marquillas. According to Soepono [8], the differential shift component in the form of competitive advantage enhanced by Estaban Marquillas Shift-Share becomes:

$$C'_{ij} = E'_{ij} (r_{ij} - r_n)$$

C'_{ij} is the competitive advantage in sector i in the economy of a region and E_{ij} is the expected E_{ij}. The formula for finding E'_{ij} is as follows:

$$E'_{ij} = E_j (E_{in} / E_n)$$

Whereas the effect of allocation as an unexplained part of a regional variable (A_{ij}) is formulated as follows:

$$A_{ij} = (E_{ij} - E'_{ij}) (r_{ij} - r_{in})$$

where, A_{ij} = the effect of allocation divided into two parts, namely the level of specialization of sector i in the study area multiplied by competitive advantage; ($E_{ij} - E'_{ij}$) = level of specialization that occurs when the study area variable is greater than the expected variable; and ($r_{ij} - r_{in}$) = competitive advantage that occurs when the growth rate of sector i in the study area is greater than the growth rate of the same sector in the reference region.

The effect of this allocation is substituted in the classic shift share analysis to shift share modified by Estaban Marquillas (E-M) into the following form:

$$D_{ij} = E_{ij} (r_n) + E_{ij} (r_{in} - r_n) + E'_{ij} (r_{ij} - r_{in}) + (E_{ij} - E'_{ij}) (r_{ij} - r_{in})$$

The assessment criteria from the modified shift share analysis of Esteban-Marquilas can be seen in Table 2 below:

Table 2. Esteban-Marquilas Modified Shift Share Analysis Assessment Criteria

Criteria	$r_{ij} - r_{in}$	$E_{ij} - E'_{ij}$	Competitive advantage	Specialization	Information
1	>0	>0	√	√	Has a competitive and specialized advantage
2	>0	<0	√	x	Has a competitive advantage but is not specialized
3	<0	>0	x	√	Has no competitive advantage but is specialized
4	<0	<0	x	x	Has no competitive advantage and is not specialized

Source: Soepono, [8].

3. Result and Discussion

3.1. Shifting the agricultural sector in its contribution to GRDP and employment.

The development of the contribution of primary, secondary and tertiary sectors to West Java's GRDP that occurred in the last 6 years (ie the period 2013-2018), can be seen in Figure 1 below:
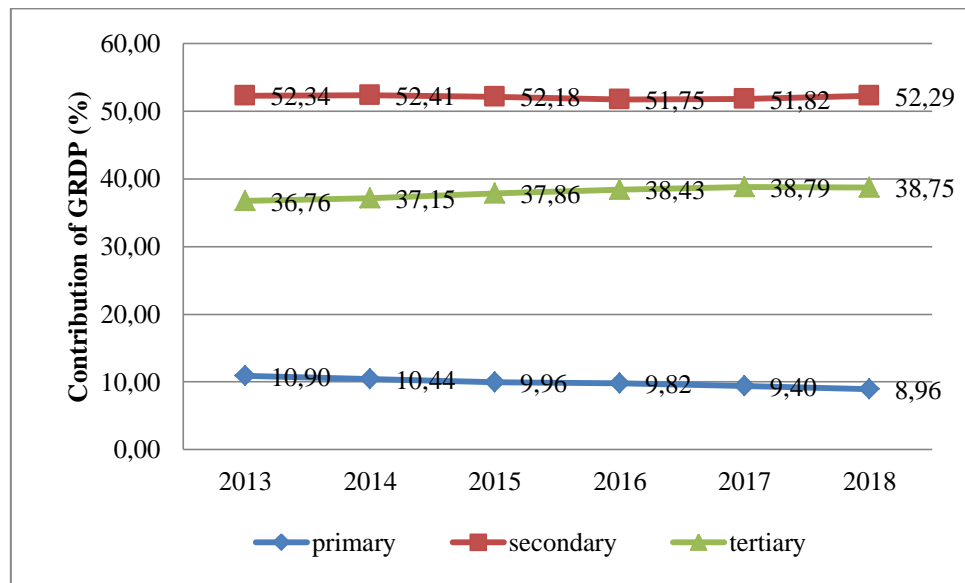
Figure 1. Contribution of Primary, Secondary and Tertiary Sectors to the Formation of West Java's GRDP in 2013-2018 (adhk 2010)

From Figure 1 it can be seen that the contribution of the agricultural sector tends to decrease (ie from 10.9% to 8.96%), the contribution of the industrial sector increases (from 36.76% to 38.75%), while the service. When compared with Indonesia, the picture in West Java is not much different from Indonesia, which is the smallest contribution of the agricultural sector compared to the industrial and service sectors. Data from the Coordinating Minister for the Economy states that the contribution of the sector to GDP, for agriculture, industry and services and others, respectively: 13.14%, 20.16% and 66.70%.

The decreasing contribution of the agricultural sector in the GRDP according to Johnston and Kilby, P. [2], concerns the effect of the distribution and size of land tenure and the type of agricultural technology adopted in rural development patterns.

While the development of the sector's contribution to employment, can be seen in Figure 2 below:
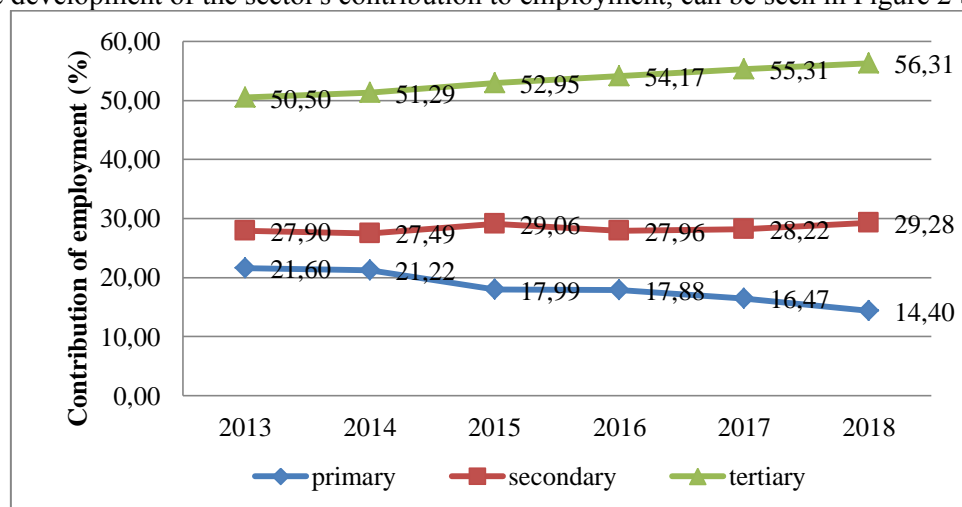
Figure 2. Contribution of Primary, Secondary and Tertiary Sectors to Labor Absorption in West Java in 2013-2018 (adhk 2010)

From the data in Figure 2, it can be seen that the contribution of the agricultural sector to employment is decreasing from 21.60% to 14.40%, while the secondary and tertiary sectors have increased. This is due to the decreasing area of agricultural land due to land conversion to non-agriculture. West Java Central Statistics Agency (BPS) states that the area of paddy fields continues to decline. BPS records that in 2018 the area of land remains 7.1 million hectares, down compared to 2017 which is still 7.75 million hectares.

Based on Figures 1 and 2 it can be concluded that the secondary sector dominates the economy of West Java with a tendency to absorb small labor. Of the 52.29 percent of the value of output produced by this sector in 2018 only with the use of labor at 29.28 percent. Unlike the tertiary sector, where the value of output produced by this sector has a smaller percentage value than the absorption of its workforce. The high value of labor absorption in the tertiary sector causes no increase in the value of output in this sector, even employment in the tertiary sector (as seen in Figure 2) shows a graph that has an upward trend, in contrast to employment in the agricultural sector which tends decreased. This indicates that the workforce in the primary sector has shifted more to the tertiary sector. One of the causes of the high absorption of labor in the tertiary sector is the presence of conditions where the level of continued industrialization is experiencing rapid growth among other sectors.

3.2. Shifting the agricultural sector in West Java through the shift share approach.

Based on the shift share analysis with the classical approach, the economy of West Java during 2013-2018 experienced a change of 348,326.78 billion rupiah, in which the agricultural sector accounted for 9,759.83 billion rupiah or around 2.80 percent of changes in the entire economic sector. Changes (D) in the form of increasing economic growth are influenced by the national component (N_{ij}), the industrial mix component (M_{ij}) and the competitive advantage component (C_{ij}) which are all positive. This indicates that the overall economic sector in West Java is classified as progressive. Slightly different from the agricultural sector which has a negative value for the components of the industrial mix (M_{ij}) and competitive advantage (C_{ij}), as shown in Table 3 below:

Table 3. Classic shift share analysis of West Java in 2013-2018

Sector	Nij	Mij	Cij	Dij
1. Agriculture, Forestry and Fisheries	22.784,96	-4.225,97	-8.799,16	9.759,83
a. Food Crops	10.169,92	-5.557,07	-3.428,16	1.184,70
b. Horticultural Crops	4.438,58	-422,54	-437,79	3.578,25
c. Plantation Plants	1.986,52	-315,44	-2.098,26	-427,18
d. Animal Husbandry	3.047,36	-223,70	410,68	3.234,34
e. Agriculture and Hunting Services	363,99	-100,07	-104,25	159,67
f. Forestry and Logging	208,03	-152,50	-47,24	8,29
g. Fisheries	2.570,56	832,18	-825,75	2.576,99
2. Mining and Excavation	6.279,89	-6.115,01	-1.475,48	-1.310,60
3. Processing Industry	130.269,09	-9.671,96	25.579,79	146.176,92
4. Electricity and Gas Procurement	1.376,04	-233,91	-1.591,94	-449,80
5. Water Supply, Waste Management, Waste and Recycling	238,29	23,77	44,17	306,23
6. Construction	24.678,20	8.257,90	606,26	33.542,36
7. Wholesale and Retail Trade, Car and Motorcycle Repair	46.865,45	-4.471,79	-1.931,68	40.461,98
8. Transportation and Warehousing	14.149,51	8.195,28	-1.133,27	21.211,51
9. Accommodation and Eating Drinks	7.681,29	938,03	4.552,44	13.171,76
10. Information and Communication	11.181,98	10.039,03	10.413,61	31.634,61
11. Financial Services and Insurance	7.516,60	2.611,00	-21,68	10.105,92

12. Real Estate	3.550,52	-412,82	2.364,27	5.501,98
13. Company Services	1.264,92	985,56	-67,69	2.182,79
14. Government Administration, Defense and Social Security Required	6.042,97	-1.022,45	-1.217,83	3.802,69
15. Educational Services	8.211,85	662,56	6.899,14	15.773,55
16. Health Services and Social Activities	2.269,84	976,68	1.940,03	5.186,56
17. Other Services	6.206,95	5.093,29	-31,75	11.268,49
Total	**300.568,35**	**11.629,21**	**36.129,22**	**348.326,78**

Over a period of 6 years, the agricultural sector in West Java as shown in Table 3 shows a positive value for the national growth component (Nij) with a value obtained of 22,748.96 billion rupiah. This value shows that the growth of the agricultural sector in West Java is still very dependent on the national economy. National growth has an influence on regional growth because regions are an internal part of a country. The positive growth of the agricultural sector in West Java is the impact of economic development plans and policies that synergize between the national and regional levels. Agricultural development policies issued by the Ministry of Agriculture based on the 2015-2019 strategic plan have a positive impact on the agricultural sector in West Java, such as the policy of increasing rice self-sufficiency causing the national growth component (NIJ) in the food crop sub-sector in West Java to obtain the highest value compared to other agricultural sub-sectors, which reached 10,169.92 billion rupiah.

According to the calculation of the national growth component (NIJ), the growth of the agricultural sector at the national level has influenced the growth of the agricultural sector in West Java amounting to 22,748.96 billion rupiah or around 7.57 percent. When in fact the development of the agricultural sector in West Java only amounted to 9,759.83 billion rupiah or around 2.80 percent of the total development of all economic sectors in West Java. This is because there are two other components that have an influence on the development of the agricultural sector in West Java, namely the industrial mix component (Mij) and the competitive advantage component (Cij).

The component of the industrial mix (Mij) in the agricultural sector showed a negative influence on the development of the agricultural sector in West Java amounting to -4,225.97 billion rupiah. This negative value indicates that the agricultural sector in West Java tends to lead to a relatively slow economy. This can be explained that agriculture in West Java is land-based, so when the conversion of agricultural land to non-agricultural land occurs, it will automatically affect the production of the agricultural products themselves. Food crops are a sub sector whose growth tends to be slower than other agricultural sub sectors. This is evidenced by rice production in West Java, which decreased from 2013 by 12,083,162 tons to 9,539,330 tons in 2018 due to land use change in West Java which reached 10,259 hectares [9].

Likewise for the competitive advantage component (Cij) where the agricultural sector also shows a negative value. The negative value indicates that the agricultural sector in West Java has no competitiveness compared to other regions in Indonesia. That is because basically the output of the agricultural sector in West Java is the same as the output of the agricultural sector from other regions. As for the commodity of rice in the food crops sub-sector where in the eastern part of Indonesia has now been planting on these commodities since the Suharto era in 1966. The negative value obtained by the component of competitive advantage (Cij) in the agricultural sector in West Java has an impact on reducing development the economy in West Java, especially developments in the agricultural sector. But that does not mean that the agricultural sector in West Java is not competitive at all, because there is an agricultural sub-sector that has a positive value, namely the livestock sub-sector. The calculation results for the competitive advantage component (Cij) are in line with the research results of Arief Daryanto [10] which shows that some agricultural commodities that are in agricultural centers in West Java have competitive advantages which are quite alarming, especially for food commodities.

Then for the shift share analysis with the modification of Esteban-Marquilas shows the effect of allocation with sectors that have a competitive advantage and specialization of a region. The results of

this analysis indicate that the agricultural sector has no competitive advantage or regional specialization except in the food crops sub-sector and the hoticulture crop sub-sector. This can be seen in Table 4 as follows:

Table 4. Shift share analysis based on Esteban Marquilas West Java in 2013-2018

Sector	Competitif advantage	Specialization	Aij (allocation effect)	Kode
1. Agriculture, Forestry and Fisheries	-0,13	-365.586,31	45.886,37	4
a. Food Crops	-0,14	16.612,73	-2.283,57	3
b. Horticultural Crops	-0,06	1.658,91	-94,33	3
c. Plantation Plants	-0,31	-209.832,11	64.313,23	4
d. Animal Husbandry	-0,01	-35.353,79	299,44	4
e. Agriculture and Hunting Services	-0,10	-4.985,37	521,20	4
f. Forestry and Logging	-0,15	-38.164,60	5.641,15	4
g. Fisheries	0,04	-95.519,11	-3.409,66	2
2. Mining and Excavation	0,02	-413.486,71	-9.061,51	2
3. Processing Industry	0,02	1.357.385,93	28.434,35	1
4. Electricity and Gas Procurement	-0,18	-40.323,93	7.216,86	4
5. Water Supply, Waste Management, Waste and Recycling	0,04	-291,74	-11,70	2
6. Construction	-0,03	-128.532,30	3.421,03	4
7. Wholesale and Retail Trade, Car and Motorcycle Repair	-0,03	111.522,06	-3.027,56	3
8. Transportation and Warehousing	0,05	36.092,95	1.899,98	1
9. Accommodation and Eating Drinks	0,11	-35.855,46	-4.033,35	2
10. Information and Communication	0,36	-85.598,92	-31.213,49	2
11. Financial Services and Insurance	0,04	-100.520,21	-3.526,55	2
12. Real Estate	0,05	-119.502,18	-6.334,74	2
13. Company Services	-0,04	-85.994,97	3.138,78	4
14. Government Administration, Defense and Social Security Required	-0,06	-95.621,33	5.296,04	4
15. Educational Services	0,31	-30.594,60	-9.519,72	2
16. Health Services and Social Activities	0,36	-24.265,68	-8.625,39	2
17. Other Services	0,02	21.172,85	318,30	1

Esteban-Marquilas modified shift share analysis results as shown in Table 4 shows that the agricultural sector has a positive allocation effect, which means that the agricultural sector in West Java has the potential to contribute as a contributor to West Java's GRDP. However, the positive value is inversely proportional to the competitive advantage and specialization of the agricultural sector in West Java which is actually negative. The agricultural sector has a competitive advantage value of -0.13 and a specialization value of -365,586.31 billion rupiah.

Based on calculations using Esteban-Marquilas modifications, the agricultural sector in West Java has absolutely no competitive advantage. The agricultural sector in West Java is also not specialized

except in the food crops and horticulture sub-sectors. Food crops and horticultural crops are agricultural sub-sectors that have an important role for the agricultural sector in the aggregate in West Java in its contribution to the formation of GRDP. Food crops (rice commodities) at the level of West Java Province in 2018 have a higher productivity value than the national level, which is 5.64 million tons per hectare, while at the national level it is 5.17 million tons per hectare. The agricultural sector in West Java, which has the next important role, is the horticultural crops sub-sector, where this sub-sector is a sub-sector with the largest contributor to exports compared to other agricultural sub-sectors, both for export outside the province and abroad. According to the Minister of Agriculture [11], there are 42 types of West Java horticultural commodities exported to 12 countries. Horticultural commodities exported include fruit commodities such as pineapple, mangosteen, salak, banana, mango, orange, durian, various other fruits, then also from vegetable commodities such as baby beans, watercress, potatoes, petai , and other types of vegetables, and ornamental plant commodities (tirto.id-smj / ale, 2019).

4. Conclusions And Policy Implications

4.1. Conclusion

Based on the shift share analysis, the classical approach shows that the growth of the agricultural sector in West Java is positively influenced by national economic growth. The growth of the agricultural sector in West Java is relatively slow and has no competitive advantage, with a rate of change of only 2.80 percent. Whereas based on the shift share analysis Esteban-Marquilas modification also shows the same thing for competitive advantage, and does not have a specialization of location effects, except in the food crops and horticulture subsectors.

4.2. Policy Implications

Increasing the growth of the agricultural sector that specializes in location effects needs to be developed by increasing production and productivity, as well as improving product quality in order to be competitive with the same products from other regions. Increasing the growth of the agricultural sector in West Java also needs to be adjusted to the geographical area of the local area, so that each region (regency / city) in West Java has its own superior local products that are competitive at national and international levels.

Therefore, support from the local government, both at the provincial and district / city level is needed to increase the growth of the agricultural sector in the aggregate through policies that support agricultural development, such as infrastructure provision, capital assistance, product certification and easy access to farmer services to production inputs and also the market.

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