Klassen Typology Approach for Analysis of the Role of Competitiveness Agricultural Sector

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Abstract. In the era of globalization, the role of the agricultural sector in an area faced with the demand for increased productivity and efficiency in order to be competitive in the domestic and international markets. The purpose of this study is to determine the role of the agricultural sector in improving regional competitiveness. The method used is a Klassen Typology approach. Klassen Typology Approach used to identify the position of agriculture sector of Madiun District in increasing the competitiveness of the region by considering the economic sector of Jawa Timur province as the reference area. The results of the research expected to be recommendations for the formulation of policies undertaken by the local government. The role of the agricultural sector in the context of strengthening regional competitiveness expected to increase locally-generated revenue (PAD) as well as to support and encourage the development of other sectors, and increase regional and national economic growth as to increase income per capita society.

1. Introduction
The economic potential of a region (district/city) is a basic capital and is a very influential factor that is owned by a province and can be used to achieve development goals in improving the welfare of its people [1]. Economic development that occurs in an area is a collaboration between the Regional Government and its people in managing existing resources, by establishing partnerships between the Regional Government and the private sector in creating jobs and in order to stimulate economic growth in the area [2]. Regional development should be tailored at best to the priorities and potential of each area in the region. Moreover, each local government should also strive for a more balanced development within their respective regions [3].

The success of a region's economic development, whether carried out by the government or the private sector in improving the welfare of its people, can be seen by looking at the value of Gross Regional Domestic Product (GRDP). An increase or decrease in the economic growth of a region within a certain period of time both comprehensively and sectorally can be seen from the percentage growth of Gross Regional Domestic Product (GRDP)[4].

The economic structure of a region can be seen from various aspects. [5] said that the structure of the economy can be divided into four reviews, namely: (1) Based on sectoral macro reviews, dividing the economy into agrarian structures (agriculture) and industrial or commercial (commerce) structures, depending on what sector is the backbone of the economy of a region. (2) Based on spacial reviews, dividing the economy into rural (traditional) or urban (modern) structures. (3) Based on the review of the organization, dividing the economy into an ethical, egalitarian or bourgeois structure. This predicate depends on who or which group is the main actor in the economic activities of a region. And (4) centralistic or decentralized economic structure.
The agricultural sector is still the most important sector, both at the national and regional levels. At the time of the economic crisis in Indonesia in 1997, the agricultural sector proved to be able to survive. The agricultural sector does have resistance to structural shocks from the macroeconomy.

The role of the agricultural sector began to tend to decline along with the increase in per capita income which illustrates the process of structural transformation. The decline in the agricultural sector is caused by the interaction of various processes that work on the demand, supply, and shifting community activities. Increased per capita income encourages a shift in community activities, from agricultural sector activities to non-agricultural sectors. This causes an increase in economic growth in the non-agricultural sector, while the agricultural sector has decreased. With this reality, it does not mean that the decline in the agricultural sector in the national economy causes the agricultural sector to be less meaningful [4]. This can be seen from the structure of the workforce in Indonesia which is still dominated by the agricultural sector which is 42.76% followed by the trade, hotel and restaurant sector by 20.05%, and the processing industry 12.29% [6].

The agricultural sector generally is still the dominant sector in Madiun District, where the majority of the population is engaged associated with the agricultural sector either directly or indirectly. Figures in general land use show that the majority of land in Madiun District used for activities related to agriculture, such as food crops, plantations, forestry, and livestock. Agricultural land in Madiun District more than 93% already use irrigation, it is expected to support the level of agricultural productivity. Where in 2017 the total production of rice plants reached 596,135 tons. Plantation crops are still dominated by a few kinds of plants, such as cocoa, cloves, coconut, coffee, and sugar cane. The overall production value of the plantation sector has increased compared to the previous year [7].

Basically the Gross Regional Domestic Product (GRDP) in Indonesia consists of 17 (seventeen) sectors, namely agriculture, forestry, and fisheries sectors; mining and quarrying sector; processing industry sector; sector of electricity and gas procurement; sector of water supply, waste management, waste and recycling; construction sector; wholesale and retail trade, car and motorcycle repair sectors; transportation and warehousing sectors; sector of providing accommodation and food & beverage; information and communication sector; financial services and insurance sectors; real estate sector; company service sector; government administration, defense and social security are obligatory sectors; education service sector; health services and social activities sectors; and other service sectors.

The economic structure of a region can be known by looking at the role of each sector towards the total GRDP. The sector that contributes the largest income to the total regional income of Madiun District on the basis of constant prices in 2012 to 2017 is the agricultural sector with an average value of 31.46%, while the second largest contributor sector is the wholesale and retail trade sector of 15.36%. The electricity and gas procurement sector do not have enough influence on the total regional income of Madiun District because it only contributes an average of 0.09%. Likewise for the water supply, waste management, waste and recycling sectors which only contribute an average of 0.16% from 2012 to 2017.

Some previous researches have some similarities with this research, such as one by [8]. They determine and classify the growth of the agricultural sector in Lhokseumawe city, Aceh and to identify the base and non-base sectors in each agricultural subsector. This research used Time Series GRDP data for 15 years of 2002-2016, with Shift Share method, Klassen’s Typology and Location Quotient analysis. The results of this study indicate that during the study period the value of GRDP of Lhokseumawe city has been progressing, it is characterized by the influence of total growth value which indicates a positive value, and subsector that contributes the most is fishery sub-sector.

[9]Identify the highest agricultural category contribution in the West Nusa Tenggara province; the basic or non-basic category in current and future; economic structure changes in the agricultural category; and classifying agricultural category. The data analysis by Location Quotient, Dynamic Location Quotient, Shift-Share and Klassen Typology. The results with the highest contribution to the West Nusa Tenggara GRDP is the agriculture category of 23.5%. The highest contribution of an agricultural category to the agricultural category GRDP in West Nusa Tenggara is a Bima District of 46.8%. Based on the Klassen Typology analysis, there are two classifications of agriculture category that is the prime classification (forestry and logging category and fishery category) and potential classification (agriculture category).
This study aims to determine the growth classification of the economic sector in the Madiun District region and determine the leading economic sectors of the Madiun City region and analyse the

| No | Sector                                      | 2012     | 2013     | 2014     | 2015     | 2016*    | 2017*    |
|----|---------------------------------------------|----------|----------|----------|----------|----------|----------|
| 1. | Agriculture, forestry, and fisheries        | 3,136,750.19 | 3,201,108.17 | 3,281,387.04 | 4,812,898.08 | 5,071,565.34 | 5,193,231.16 |
| 2. | Mining and quarrying                        | 107,568.83 | 120,872.42 | 134,033.38 | 144,714.86 | 156,748.85 | 168,427.78 |
| 3. | Processing industry                         | 896,074.90 | 1,103,345.75 | 1,222,994.40 | 1,358,271.58 | 1,500,509.94 | 1,663,076  |
| 4. | Electricity and gas procurement             | 9,262.71  | 9,553.56  | 10,879.20  | 12,333.88  | 13,213.39  | 15,257.82  |
| 5. | Water supply, waste management, waste, and recycling | 15,932.14 | 18,420.17 | 19,389.05 | 21,100.11 | 23,258.63 | 25,066.75  |
| 6. | Construction                                | 953,338.86 | 1,248,526.36 | 1,448,646.01 | 1,641,782.66 | 1,875,264.21 | 2,121,269  |
| 7. | Wholesale and retail trade, car, and motorcycle repair | 1,370,301.40 | 1,687,089.06 | 1,876,429.95 | 2,094,320.36 | 2,381,908.99 | 2,647,440.25 |
| 8. | Transportation and warehouse                | 127,118.12 | 156,737.85 | 189,148.28 | 217,540.39 | 243,790.60 | 273,538.59  |
| 9. | Providing accommodation and food & beverage communication | 200,028.40 | 242,114.71 | 267,682.73 | 297,178.43 | 343,509.16 | 385,858.16  |
| 10. | Information and communication               | 627,895.33 | 709,194.63 | 782,969.15 | 880,901.01 | 973,657.06 | 1,064,849.20 |
| 11. | Financial services and insurance            | 231,497.83 | 289,780.54 | 322,119.98 | 361,934.90 | 402,647.77 | 444,342.78  |
| 12. | Real estate                                 | 156,184.32 | 183,412.80 | 199,454.50 | 226,419.76 | 247,157.88 | 272,176.45  |
| 13. | Company service                             | 29,392.66  | 36,749.45  | 41,024.87  | 46,133.04  | 50,968.96  | 55,851.11   |
| 14. | Government administration, defense, and social security are obligatory | 577,504.51 | 706,752.02 | 734,900.70 | 797,994.83 | 879,025.36 | 932,518.21  |
| 15. | Education service                           | 391,698.19 | 474,810.48 | 516,054.92 | 566,184.02 | 610,503.78 | 664,239.23  |
| 16. | Health services and social activities       | 78,799.98  | 90,334.89  | 99,675.79  | 108,932.82 | 117,968.58 | 128,472.15  |
| 17. | Other services                              | 226,349.86 | 253,329.35 | 278,758.01 | 312,822.26 | 335,252.28 | 362,103.48  |
|    | GRDP                                        | 9,135,698.24 | 11,293,562.04 | 12,532,050.4 | 13,901,454.0 | 15,226,950.8 | 16,417,718.13 |

*) Temporary number

Another relevant research was performed by [10]. He aims at probing into the spatial competitiveness of economic sector in Banyuwangi district by applying a shift-share analysis. The results indicate the agriculture, mining and manufacturing sector are no longer the backbone of the economy of Banyuwangi. Identification of investment priorities within this potential sector and implementation of a comprehensive regional development policy plan would definitely accelerate the economic growth of Banyuwangi district.

This study aims to determine the growth classification of the economic sector in the Madiun District region and determine the leading economic sectors of the Madiun City region and analyse the
role of the agricultural sector to strengthen regional competitiveness, by explaining how economic sectors in Madiun district are compared to the economic structure of East Java as a reference. By knowing what sectors are most dominant affecting the economy of the city of Madiun, it can be input for the regional government in determining the regional sector and conducting economic development planning in Madiun District.

1.1. Location research
This research was conducted in Madiun district is one of the regencies in the East Java Province, Indonesia. Consideration of the research was carried out in Madiun District so that the results of this study could be used as information and could be prioritized in the development planning of Madiun District. Furthermore, it is expected that the policies produced by local governments always refer to the leading sectors of the regional economy.

1.2. Method of Data Collection and Analysis
The data used in this study is secondary data in the form of GRDP based on constant prices of Madiun District and East Java Province for the 2012-2017 period which is used for the classification of the leading sector classification obtained from the Madiun District Statistical Center [7], [11]. The development of GRDP at constant prices is one of the important indicators to see how much economic growth in a region. Economic growth is one indicator that is used to evaluate the results of the development of an area. Therefore, the development strategy is striving to explore the existing potential, so that it can spur economic growth and development in the area. Based on the data and information contained in the GRDP, several analyzes can be done to obtain information about:

a. Sector Growth Classification
This analysis is needed to identify the economic position of an area by referring to a higher regional economy. The results of the analysis will show the sector position in the GRDP classified into the advanced and fast-growing sectors, the potential sector or still able to develop, the relative lagging sector, and the advanced but depressed sector. Based on this classification can be used as a basis for determining development policies on the position of the economy that is owned by the regional economy which is a reference.

b. Sector Changes and Shifts
This analysis is needed to find out the changes and shifts of sectors in the economy of a region. The results of the analysis will describe the performance of the sectors in the regional GDP compared to the reference area. If the deviation is positive, then it is said that a sector in GRDP has a competitive advantage or vice versa.

The development implemented is expected to have implications for economic growth. Development that is oriented towards achieving sectoral targets, its success can be seen from the sector's contribution to the formation of GRDP from year to year. Positive growth indicates an increase in the economy and if negative means a decline in economic activity. Economic growth results in changes in the development of a region's development. Economic development planning aims to improve community welfare, one of which can be achieved with economic growth. Economic growth itself can increase if there are one or several economic sectors that develop faster than other sectors. Thus, sectors that have a faster development than other sectors will be the leading sectors. Leading sectors owned by an area will have a significant influence on the economic growth of a region because it will provide competitive or comparative advantages which will further encourage the development of exports of goods and services. Development strategy policies must be directed toward policies that have an optimal impact on economic growth, increased community income, and job creation. Leading sectors obtained through analysis can be a basis for consideration in future development planning.

The methods of analysis in this research used a quantitative descriptive analysis approach. The data analysis technique used in this study is the Klassen Typology analysis, which is one of the economic analysis tools used to determine the classification of the economic sector of a region [12]. Klassen Typology analysis is used with the aim of identifying and analyzing the position of the agricultural sector in the economic structure of Madiun District by taking into account the economic structure of
East Java Province as a reference area. Klassen Typology Analysis produces four sector classifications with different characteristics as follows [13]:

a. Developed sector (Quadrant I). This quadrant is a quadrant whose growth rate of a particular sector in GRDP \( r_i \) is greater than the growth rate of the sector in regional GRDP which is a reference \( r \) and has a value of sector contribution to GRDP \( y_i \) which is greater than the sector's contribution to GRDP the area that becomes the reference \( y \). This classification is denoted by \( ri > r \) and \( yi > y \);

b. Advanced but depressed sector (stagnant sector) (Quadrant II). This quadrant is a quadrant whose growth rate of a particular sector in GRDP \( r_i \) is smaller than the growth rate of the sector in the regional GRDP which is a reference \( r \), but has a sector contribution to GRDP \( y_i \) which is greater than the sector's contribution to GRDP is the reference \( y \). This classification is denoted by \( ri < r \) and \( yi > y \);

c. Potential sector or still developing (developing sector) (Quadrant III). This quadrant is a quadrant whose growth rate of a particular sector in GRDP \( r_i \) is greater than the growth rate of the sector in the regional GRDP which is a reference \( r \), but has a value of sector contribution to GRDP \( y_i \) which is smaller than the sector's contribution to GRDP is the reference \( y \). This classification is denoted by \( ri > r \) and \( yi < y \);

d. Underdeveloped sectors (Quadrant IV). This quadrant is a quadrant with a certain sector growth rate in GRDP \( r_i \) which is smaller than the growth rate of the sector in regional GRDP which is a reference \( r \) and at the same time has a sector contribution to GRDP \( y_i \) which is smaller than the sector's contribution to GRDP is the reference \( y \). This classification is denoted by \( ri < r \) and \( yi < y \). As listed below [14]:

### Table 2. Classification Klassen Typology Approach

| Quadrant I (K1) | Quadrant II (K2) |
|-----------------|------------------|
| advanced and rapidly growing sector | depressed growth sector |
| \( r_i > r \) dan \( y_i > y \) | \( r_i < r \) dan \( y_i >= y \) |

| Quadrant III (K3) | Quadrant IV (K4) |
|-------------------|------------------|
| potential or can still growing sector | Relatively underdeveloped sector |
| \( r_i > r \) dan \( y_i < y \) | \( r_i < r \) dan \( y_i < y \) |

Remarks:
- \( r_i \) : growth rate of GDP sector for district i
- \( r \) : province GDP growth rate sector
- \( y_i \) : contribution sector of district i
- \( y \) : province contribution sector

2. Results and Discussion

2.1. Overview of Madiun District and its surroundings

Astronomically, Madiun District is located between 7°12’ – 7°48’ North latitude and 111° 25 - 111° 51’ East Longitude. In terms of geographic position, Madiun District has boundaries as follows: North: Bojonegoro District; East: Nganjuk District; North: Ponorogo District; West: Magetan and Ngawi District; Madiun District area surrounding Madiun municipality. The distance between Madiun and the capital city of East Java province approximately 175km to the east, while the distance to capital state approximately 775 miles to the opposite ways. Madiun District has 15 subdistrict which Kare subdistrict is the largest area in Madiun, mostly consist of forest and hills. And Sawahan is the smallest district [7].

2.2. Classification of the Growth in the Economic Structure of Madiun District
Klassen typology analysis method is used to determine the economic sector grouping of Madiun District according to the growth of the economic sector [15]. By using the Klassen typology analysis quadrant, four sector groupings can be carried out by utilizing the growth rate and contribution value.

Table 3. Madiun District Economic Growth Rate in 2012-2017 (%)

| Sector | 2012  | 2013  | 2014  | 2015  | 2016* | 2017* |
|--------|-------|-------|-------|-------|-------|-------|
| 1      | 5.15% | 2.05% | 2.50% | 2.64% | 2.55% | 1.27% |
| 2      | 0.42% | 0.71% | 1.11% | 1.18% | 4.05% | 5.35% |
| 3      | 5.00% | 6.48% | 5.73% | 6.43% | 6.05% | 7.69% |
| 4      | 10.07%| 6.21% | 7.57% | 1.84% | 2.47% | 4.10% |
| 5      | 6.08% | 6.37% | 2.99% | 4.53% | 5.02% | 5.86% |
| 6      | 6.97% | 8.30% | 8.14% | 5.98% | 7.11% | 10.19%|
| 7      | 8.85% | 8.82% | 7.48% | 6.84% | 6.84% | 7.29% |
| 8      | 8.36% | 11.15%| 10.93%| 8.13% | 6.58% | 7.64% |
| 9      | 4.97% | 6.18% | 7.04% | 7.52% | 8.70% | 8.76% |
| 10     | 10.29%| 10.84%| 10.31%| 8.69% | 7.63% | 7.31% |
| 11     | 8.89% | 12.10%| 7.14% | 7.16% | 7.32% | 7.00% |
| 12     | 5.98% | 7.56% | 6.45% | 6.24% | 6.17% | 7.21% |
| 13     | 5.22% | 7.14% | 7.31% | 7.38% | 5.53% | 5.76% |
| 14     | 2.63% | 1.94% | 1.39% | 4.89% | 4.52% | 2.23% |
| 15     | 5.29% | 6.72% | 5.22% | 6.40% | 5.96% | 6.04% |
| 16     | 7.27% | 6.44% | 5.27% | 6.09% | 5.81% | 5.33% |
| 17     | 3.65% | 6.45% | 6.05% | 4.76% | 4.81% | 6.05% |

*) Temporary number

Based on Table 3, it can be seen that the percentage rate of economic growth in the agricultural sector of Madiun District from 2012-2017 experienced a decline from year to year during 2012-2017. This could occur due to a shift in the activities of the community who converted agricultural land into residential land. This shift can be seen from the increase in the percentage rate of economic growth in the real estate and construction sectors during 2012-2017.

Below is shown the role of the sectoral economic structure of GRDP on the basis of the constant price of 2012-2017 in percentage (%).

Based on Table 4, it can be seen that the economic role of the agricultural sector in the GRDP of Madiun District from 2012-2017 is quite stable and is the most dominant sector with an average percentage of 34%, although there was a decrease in the percentage from 2015 to 2017. The East Java Province 2012-2017 Economic Growth Rate (%) as shown in Table 5.
### Table 4. Role of Sectoral Economy of Madiun

| Sector                                                                 | 2012   | 2013   | 2014   | 2015   | 2016*)  | 2017*)  |
|-----------------------------------------------------------------------|--------|--------|--------|--------|---------|---------|
| 1. Agriculture, forestry and fisheries                               | 34.34  | 35.09  | 35.01  | 34.62  | 33.31   | 31.63   |
| 2. Mining and quarrying                                               | 1.18   | 1.07   | 1.07   | 1.04   | 1.03    | 1.03    |
| 3. Processing industry                                               | 9.81   | 9.77   | 9.76   | 9.77   | 9.85    | 10.13   |
| 4. Electricity and gas procurement                                   | 0.10   | 0.08   | 0.09   | 0.09   | 0.09    | 0.09    |
| 5. Water supply, waste management, waste and recycling               | 0.17   | 0.15   | 0.15   | 0.15   | 0.15    | 0.15    |
| 6. Construction                                                       | 10.44  | 11.06  | 11.56  | 11.81  | 12.32   | 12.92   |
| 7. Wholesale and retail trade, car and motorcycle repair              | 15.00  | 14.94  | 14.97  | 15.07  | 15.64   | 16.13   |
| 8. Transportation and warehouse                                       | 1.39   | 1.39   | 1.51   | 1.56   | 1.60    | 1.67    |
| 9. Providing accommodation and food & beverage                       | 2.19   | 2.14   | 2.14   | 2.14   | 2.26    | 2.35    |
| 10. Information and communication                                     | 6.87   | 6.28   | 6.25   | 6.34   | 6.39    | 6.49    |
| 11. Financial services and insurance                                 | 2.53   | 2.57   | 2.57   | 2.60   | 2.64    | 2.71    |
| 12. Real estate                                                       | 1.71   | 1.62   | 1.59   | 1.63   | 1.62    | 1.66    |
| 13. Company service                                                   | 0.32   | 0.33   | 0.33   | 0.33   | 0.33    | 0.34    |
| 14. Government administration, defense and social security are obligatory | 6.32  | 6.26   | 5.86   | 5.74   | 5.77    | 5.68    |
| 15. Education service                                                | 4.29   | 4.20   | 4.12   | 4.07   | 4.01    | 4.05    |
| 16. Health services and social activities                             | 0.86   | 0.80   | 0.80   | 0.78   | 0.77    | 0.78    |
| 17. Other services                                                    | 2.48   | 2.24   | 2.22   | 2.25   | 2.20    | 2.21    |
| GRDP                                                                  | 100.00 | 100.00 | 100.00 | 100.00 | 100.00  | 100.00  |

### Table 5. East Java Province Economic Growth Rate for 2012-2017 (%)

| Sector                                                                 | 2012  | 2013  | 2014  | 2015  | 2016*)  | 2017*)  |
|-----------------------------------------------------------------------|-------|-------|-------|-------|---------|---------|
| 1. Agriculture, forestry, and fisheries                               | 5.14  | 3.06  | 3.54  | 3.29  | 2.41    | 1.48    |
| 2. Mining and quarrying                                               | 0.25  | 1.31  | 3.07  | 7.96  | 14.18   | 7.47    |
| 3. Processing industry                                               | 6.73  | 5.85  | 7.67  | 5.63  | 4.44    | 5.69    |
| 4. Electricity and gas procurement                                   | -3.31 | 2.85  | 3.76  | -1.98 | 0.64    | 2.58    |
| 5. Water supply, waste management, waste and recycling               | 0.91  | 4.15  | 0.25  | 5.28  | 5.19    | 6.44    |
| 6. Construction                                                       | 7.45  | 8.05  | 5.44  | 3.60  | 5.51    | 6.91    |
| 7. Wholesale and retail trade, car and motorcycle repair              | 8.21  | 6.21  | 5.01  | 5.55  | 5.81    | 6.26    |
| 8. Transportation and warehouse                                       | 7.24  | 8.60  | 6.49  | 6.68  | 5.71    | 6.62    |
| 9. Providing accommodation and food & beverage                       | 5.68  | 5.65  | 8.88  | 7.72  | 8.49    | 7.91    |
| 10. Information and communication                                     | 12.37 | 12.03 | 5.88  | 6.49  | 7.57    | 6.92    |
| 11. Financial services and insurance                                 | 10.71 | 13.80 | 6.76  | 7.19  | 6.99    | 2.44    |
| 12. Real estate                                                       | 7.98  | 7.37  | 6.97  | 4.97  | 5.22    | 3.91    |
| 13. Company service                                                   | 3.19  | 7.45  | 8.52  | 5.44  | 5.18    | 5.53    |
| 14. Government administration, defense and social security are obligatory | 1.39  | 1.26  | 0.58  | 5.24  | 4.74    | 2.22    |
| 15. Education service                                                | 8.66  | 8.60  | 6.08  | 6.53  | 5.97    | 3.99    |
| 16. Health services and social activities                             | 10.70 | 7.96  | 8.17  | 6.46  | 5.74    | 5.39    |
| 17. Other services                                                    | 2.81  | 5.11  | 5.46  | 4.88  | 4.77    | 4.46    |

*) Temporary Number
Table 6 is shown the role of the structure of the sectoral economy of the GDP of East Java Province on the basis of the constant price of 2012-2017 (%).

Table 6. Role of Sectoral Economy of East Java Province GRDP at Constant 2012-2017 Prices (%)

| Sector | 2012 | 2013 | 2014 | 2015 | 2016* | 2017* |
|--------|------|------|------|------|-------|-------|
| 1. Agriculture, forestry and fisheries | 13.47 | 13.46 | 13.56 | 13.72 | 13.43 | 12.80 |
| 2. Mining and quarrying | 5.30 | 5.34 | 5.11 | 3.93 | 2.76 | 4.00 |
| 3. Processing industry | 29.28 | 28.79 | 28.95 | 29.28 | 28.88 | 29.03 |
| 4. Electricity and gas procurement | 0.48 | 0.37 | 0.36 | 0.35 | 0.33 | 0.33 |
| 5. Water supply, waste management, waste and recycling | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 |
| 6. Construction | 9.18 | 9.22 | 9.49 | 9.48 | 9.72 | 9.79 |
| 7. Wholesale and retail trade, car and motorcycle repair | 17.67 | 17.70 | 17.34 | 17.58 | 17.98 | 18.18 |
| 8. Transportation and warehouse | 2.88 | 3.07 | 3.25 | 3.35 | 3.38 | 3.43 |
| 9. Providing accommodation and food & beverage | 4.82 | 4.91 | 5.20 | 5.40 | 5.65 | 5.75 |
| 10. Information and communication | 4.73 | 4.78 | 4.54 | 4.55 | 4.58 | 4.60 |
| 11. Financial services and insurance | 2.44 | 2.64 | 2.68 | 2.74 | 2.78 | 2.73 |
| 12. Real estate | 1.61 | 1.63 | 1.57 | 1.63 | 1.61 | 1.59 |
| 13. Company service | 0.77 | 0.79 | 0.79 | 0.80 | 0.80 | 0.81 |
| 14. Government administration, defense and social security are obligatory | 2.65 | 2.51 | 2.32 | 2.31 | 2.32 | 2.27 |
| 15. Education service | 2.63 | 2.73 | 2.73 | 2.72 | 2.67 | 2.62 |
| 16. Health services and social activities | 0.60 | 0.61 | 0.63 | 0.63 | 0.62 | 0.62 |
| 17. Other services | 1.39 | 1.36 | 1.38 | 1.43 | 1.39 | 1.36 |
| GRDP | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Table 7 presents the results of data processing in the form of the average growth rate and contribution of the GDP sector of East Java Province and Madiun District in 2012-2017. Based on Table 7, it can be seen that the sector that has the largest contribution to the GRDP of Madiun District is the agriculture, forestry and fisheries sectors followed by the wholesale and retail trade, car and motorcycle repairs sectors. For the highest average growth, the information and communication sector was followed by the transportation and warehousing sectors and the financial services and insurance sectors. While the sector that has the smallest average growth is the mining and quarrying sector.

Based on Table 7, it can also be seen that the sector that has the highest average contribution to GRDP in East Java Province is the manufacturing industry sector; wholesale and retail trade, car and motorcycle repair; and the agricultural sector. While the sectors that contribute the smallest average contribution, namely the sector of water supply, waste management, waste and recycling; sector of electricity and gas procurement; and health services and social activities. GRDP average growth in East Java Province is the highest in the information and communication sector and financial services and insurance sectors. While government administration, defense, and social security sectors must experience the smallest average growth. Furthermore, the data in Table 8 shows the results of the classification of the economic structure of the Madiun District GRDP in 2012-2017 using the Klassen Typology analysis as listed in Table 8 below.

Based on Table 8, it can be seen the results of the classification of the economic structure of the Madiun District GRDP. The advanced and rapidly growing sector (quadrant I) is the sector of water supply, waste management, waste & recycling; construction sector; information and communication sector; real estate sector; government administration, defense, and social security sectors are obligatory; and other service sectors. Meanwhile, the agriculture, forestry and fisheries sector; education service sector; and the health services sector falls into the category of advanced but depressed sectors.
Processing industry sector; electricity and gas procurement sector; wholesale and retail trade, car and motorcycle repair; transportation and warehousing sectors; financial services and insurance sectors; and the service sector of the company is a potential sector and can still develop, while the mining and quarrying sector and the sector of providing accommodation and eating drinks are two sectors that are relatively lagging behind.

### Table 7. Growth Rate and GRDP Sector Contribution of East Java Province and Madiun District in 2012-2017

| Sector                                                                 | Madiun District | East Java Province |
|------------------------------------------------------------------------|-----------------|--------------------|
|                                                                        | Growth Average ($r_i$) | Contribution ($y_i$) | Growth Average ($r$) | Contribution ($y$) |
| Agriculture, forestry, and fisheries                                   | 2.69            | 34.00              | 3.15                | 13.41             |
| Mining and quarrying                                                   | 2.14            | 1.07               | 5.71                | 4.41              |
| Processing industry                                                   | 6.23            | 9.85               | 6.00                | 29.04             |
| Electricity and gas procurement                                        | 5.38            | 0.09               | 0.76                | 0.37              |
| Water supply, waste management, waste, and recycling                  | 5.14            | 0.15               | 3.70                | 0.09              |
| Construction                                                          | 7.78            | 11.69              | 6.16                | 9.48              |
| Wholesale and retail trade, car and motorcycle repair                  | 7.69            | 15.29              | 6.18                | 17.74             |
| Transportation and warehouse                                          | 8.80            | 1.52               | 6.89                | 3.23              |
| Providing accommodation and food & beverage                           | 7.20            | 2.20               | 7.39                | 5.29              |
| Information and communication                                         | 9.18            | 6.44               | 8.54                | 4.63              |
| Financial services and insurance                                      | 8.27            | 2.60               | 7.98                | 2.67              |
| Real estate                                                           | 6.60            | 1.64               | 6.07                | 1.61              |
| Company service                                                       | 6.39            | 0.33               | 5.89                | 0.79              |
| Government administration, defense, and social security are obligatory | 2.93            | 5.94               | 2.57                | 2.40              |
| Education service                                                     | 5.94            | 4.12               | 6.64                | 2.68              |
| Health services and social activities                                 | 6.04            | 0.80               | 7.40                | 0.62              |
| Other services                                                        | 5.30            | 2.27               | 4.58                | 1.39              |

From the results of the classification of the economic structure of the Madiun District GRDP using classical typology analysis, it can be seen that the sectors of agriculture, forestry, and fisheries are in the advanced but depressed sector categories. This indicates that the agriculture, forestry and fisheries sector is still a sector that influences the economy of Madiun District, but the shift in community activities from agricultural activities to non-agriculture causes the agriculture, forestry, and fisheries sector to decline and is quite depressed compared to other sectors in the regional economic structure, such as the real estate sector, the construction sector, and the information and communication sector.

The shift of community activities from agricultural activities to non-agriculture is likely caused by several things, including:

a. Increasing population, causing an increase in housing development.

b. Imports of agricultural products carried out by the government caused a decline in the prices of domestic agricultural products and made farmers look for other livelihoods;

c. Infrastructure development (toll roads, railroads, schools, etc.), led to the occurrence of agricultural land experts.

d. The increased population of productive age in Indonesia, causing an increase in information and communication needs.
3. Conclusion
Based on the research that has been carried out, it can be concluded that the results of the analysis using the Klassen Typology analysis tool, an advanced and rapidly growing sector in Madiun District are (1) the sector of water supply, waste management, waste & recycling; (2) Construction sector; (3) Sector information and communication; (4) Sector real estate; (5) The sector of government administration, defense and social security is compulsory; and (6) other service sectors. The Madiun district government in an effort to increase the GRDP in order to prioritize the development of leading sectors and sub-sectors by not ignoring other sectors and sub-sectors in planning and implementing development. Water supply, waste management, waste & recycling sectors; Construction sector; Sector information and communication; Sector real estate; The sector of government administration, defense and social security is compulsory; and other service sectors as the leading sector and having the largest contribution in the economy of the Madiun district area need to get priority development, so as to provide a high impact on increasing community income and employment. From the results of the classification of the economic structure of the Madiun District GRDP using classical typology analysis, it can be seen that the sectors of agriculture, forestry, and fisheries are in the advanced but depressed sector categories. This indicates that the agriculture, forestry and fisheries sector is still a sector that influences the economy of Madiun District, but the shift in community activities from agricultural activities to non-agriculture causes the agriculture, forestry, and fisheries sector to decline and is quite depressed compared to other sectors.
The growth of the agricultural sector in an area is basically influenced by regional competitive advantage, regional specialization, and agricultural potential. The existence of agricultural potential in an area is still not useful for regional growth if there is no effort to utilize and develop agricultural potential optimally. Therefore, the use and development of all potential agricultural potentials must be a top priority to be explored and developed in carrying out the development of agricultural areas as a whole.

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