

# Analysis of The Transformation of The District Economic System in Riau Province

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## ABSTRACT

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This research aims to look at the economic structure transformation in each district in Riau Province. The method used is analyzing competitive advantage and specialization of Esteban Marquillass and Klassen typology. From the results of processing, it is known that agriculture, forestry, and fisheries are superior sectors, have competitiveness, and are specialized in 6 districts in Riau, namely Indragiri Hulu (Inhu), Kampar, Indragiri Hilir (Inhil), Pelalawan, Kuantan Singingi (Kuansing), and Rokan Hulu (Rohul). The manufacturing industry is a superior sector that has competitiveness and specialization in Dumai City, and the trade sector is a sector that has a competitive advantage and specialization in Pekanbaru City. Meanwhile, no single industry has a competitive advantage and specialization in 4 other districts (Siak, Bengkalis, Rokan Hilir, and Kepulauan Meranti). Processing results with the Klassen typology show that the agricultural industry in Kuansing, Inhu, and Kampar Regencies, which 2012 was developing, will shift to become a mainstay sector in 2022. In contrast, in Bengkalis, Pekanbaru, and Dumai Regencies, this sector is still one of the lagging economic sectors.

*Keywords: Economic Transformation, Economic Structure, Competitive Advantage, Klassen Typology*

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## 1. INTRODUCTION

Economic development is an essential part of regional development to create national development. The primary purpose of development is to create a strong foundation for the economy's structure to grow and develop towards a just and prosperous society. In practice, development is mainly carried out using a sectoral approach, namely a plan based on achieving targets in increasing production for each existing sector. With this target's achievement, there is hoped to be a sectoral transition from the agricultural industry to the manufacturing or other sectors [1].

A change in the economic structure of a region is a transformation from a traditional economic system to a modern design or a difference in the monetary form from the agricultural industry to the manufacturing industry. These transformations involve all financial functions, including changes in production and the composition of demand, consumption, international trade, and resources, as well as changes in socioeconomic factors such as urbanization or population growth and distribution. These changes also depend on various factors, namely natural resources that will provide the fields, raw materials, and supporting facilities for these changes and human resources. If these factors can be met, the change process will occur well [2], [3].

At the national level, economic growth nationally indicated by the change in Gross Domestic Product (GDP). Meanwhile, Regionally, it can be seen from the Gross Regional Domestic Product (GRDP) changes. There is economic growth will continue to cause it to happen transformation in the structure of the economy [4].

Riau is the fifth largest province in its contribution to Indonesia's Gross Domestic Product (GDP) since 2009. Riau is also a relatively prosperous area with agricultural products in the form of

oil and gas and plantation products in the form of palm oil, rubber, coconut, and other commodities. Currently, the composition of Riau Province's GRDP is no longer dominated by the mining and quarrying industry. Over the past decade, the contribution of this sector has continued to decline, from 42.16 percent in 2012 to 23.43 percent in 2022. Figure 1 shows that up to 2018, the mining and quarrying sector still has an enormous contribution. However, since 2019 the gift of this sector has continued to decline until it is currently in third place after the manufacturing industry and the agriculture, forestry, and fisheries sectors. This decrease was due to decreased production from oil wells in Riau, from 133 million barrels in 2010 to 80 million in 2019, with negative growth for most of the year.

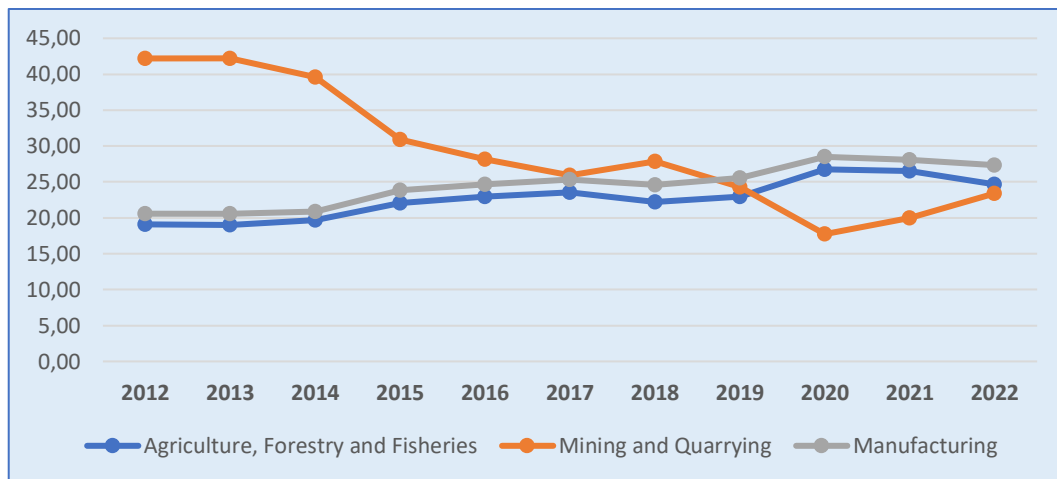


Figure 1. Contribution of the Three Main Sectors to the PDRB of Riau Province (Percent), 2012-2022

Increased economic activity in various sectors will, directly and indirectly, impact job creation. The changes in the economic structure also indirectly impact changes in the labor structure. The mismatch between economic development and employment will lead to a weak supply and demand system for labor. The expansion of the economy in the industrial sector is partly the result of the reinvestment of the surplus, requiring a lot of human resources, bearing in mind that wage rates in the agricultural industry are lower, and additional labor for the industrial sector will be higher. In other words, increasing a country's economic growth will attract workers previously in the agricultural industry to enter the industrial world.

## 2. LITERATURE REVIEW

[5] reveals that the high rate of structural and sectoral changes is closely related to the economic growth process. Key components of this structural shift include a gradual "shift" from agricultural activities to non-agricultural sectors and from the industrial sector to the service sector. Understanding the impacts of regional development—such as the changing sectors that increase or decline—is crucial for the development of a region.

According to [6], economic structure is the composition or arrangement of economic sectors within an economy. The most dominant sector holds the top position in this structure and becomes the characteristic feature of an economy. The economic structure of a region is heavily influenced by

the available natural resources and human resources in that region, which results in economic activities that may vary across regions [7].

According to [8], economic structural change, or structural transformation, is characterized by several indicators: economic growth is higher than population growth, the share of the primary sector declines, the share of the secondary sector increases, while the share of the tertiary sector remains relatively constant, and the consumption of basic needs decreases, known as Engel's Law. This implies that on the production side, the role of the primary sector diminishes, while on the demand side, the role of consumption factors decreases, with the industrial sector and investment increasing.

[9] defines structural change as a shift in the composition of demand, trade, production, and the use of production factors necessary to sustain economic growth. In a general equilibrium system, the characteristics and timing of the industrialization process are influenced by changes in domestic demand, shifts in comparative advantage, sectoral productivity growth, and capital goods accumulation.

### 3. METHODS

The data used in this study is data collected indirectly (secondary) through time series data sourced from the Statistics (BPS). This research is exploratory analytical research in proposing that the problem does not have a hypothesis to be tested and also explains the various relationships between variables. Esteban Marquillass' competitive advantage specialization analysis and the Klassen typology are used in answering predefined problem formulations.

[10] tries to overcome one weakness of the classic Shift Share analysis, namely the weighting problem, which is found to give affect competition as the third component. Through the Shift Share analysis of the Esteban-Marquillass modification, it is possible to detect sectors with competitive advantages and specialization in a region. This modification made by [10] redefines competitive advantage ( $C_{ij}$ ) from the classic Shift Share technique so that it contains a new element that is given the notation  $E_{ij}^*$ , which is defined as a region variable ( $E_{ij}$ ), if the regional structure does not differ from the national structure or  $E_{ij} = E_{ij}^*$ , then it is formulated become:

$$E_{ij}^* = E_j \left( \frac{E_{in}}{E_n} \right)$$

If  $E_{ij}$  replaced with  $E_{ij}^*$ , then the equation  $C_{ij} = E_{ij}(r_{ij} - r_{in})$  can also be replaced to:

$$C_{ij}^* = E_{ij}^*(r_{ij} - r_{in})$$

$C_{ij}$  Measures whether sector  $i$  is a superior and competitive sector in the economy in a region according to the classical Shift Share analysis. The effect of allocation effect has not been explained from a regional variable for industry  $i$  in area  $j$  ( $A_{ij}$ ), to find out the allocation effect is approached using the formula (Soepono, 1993:41):

$$A_{ij} = (E_{ij} - E_{ij}^*)(r_{ij} - r_{in})$$

Where:

$(E_{ij} - E_{ij}^*)$ : describes the degree of specialization of sector  $i$  in region  $j$

$(r_{ij} - r_{in})$ : represents the degree of competitive advantage in the industry  $i$  in district  $j$

Information:

$C_{ij}$ : Changes in GRDP of the sector (subsector)  $i$  in region  $j$  due to the superiority of the industry (subsector)

$E_{ij}$ : GRDP of sector  $i$  in region  $j$

$E_j$ : Total GRDP in region  $j$

- $E_{in}$ : GRDP sector i in Riau Province
- $E_n$ : Total GRDP in Riau Province
- $r_{ij}$ : Growth rate of sector i in region j
- $r_{in}$ : Growth rate of sector i in Riau Province

From the descriptions above, it can be concluded that an allocation effect can be seen in two parts: the degree of specialization of industry i in region j ( $E_{ij} - E_{ij}^*$ ) multiplied by competitive advantage ( $r_{ij} - r_{in}$ ). This equation can mean that if a region specializes in specific sectors, these sectors will also enjoy better competitive advantages.

Table 1. Competitive Advantage and Specialization of Esteban Marquillass Shift Share

| No. | $r_{ij} - r_{in}$ | $E_{ij} - E_{ij}^*$ | Competitive Advantage | Specialization |
|-----|-------------------|---------------------|-----------------------|----------------|
| 1.  | > 0               | > 0                 | √                     | √              |
| 2.  | > 0               | < 0                 | √                     | x              |
| 3.  | < 0               | > 0                 | x                     | √              |
| 4.  | < 0               | < 0                 | x                     | X              |

Source: Soepono (1993)

In addition, this study also uses a Klassen typology analysis. Klassen typology analysis analyzes the grouping of potential economic sectors according to each region. In this case, the indicators used are each industry's growth rate and contribution in each area. In this way, it will be possible to identify economic sectors whose growth is reliable, potential, developing, and underdeveloped.

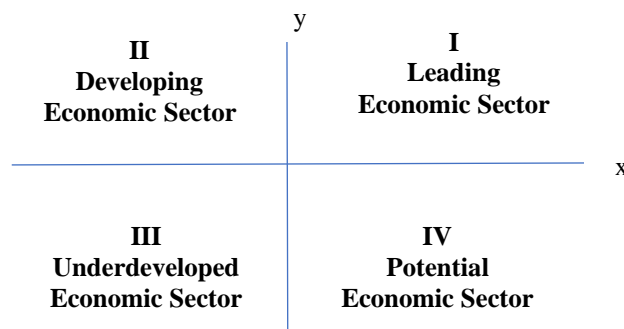


Figure 2. Klassen Typology

Leading Economic Sector is a sector in the analysis area with a higher economic growth rate, and the sectoral contribution to GRDP in the analysis region is more significant than the economic growth rate of the same industry and the assistance of the same sector to GRDP in the benchmark area.

Developing Economy Sector is a sector in the analysis area that has a lower economic growth rate than the economic growth rate of the same industry in the benchmark place but has a sectoral percentage distribution to GRDP in the analysis area that is larger than the percentage distribution of the same sector to GRDP in the benchmark area.

Potential Economic Sector or still Developing (Developing Sector) is a sector in the analysis area that has a higher economic growth rate than the economic growth rate of the same industry in the benchmark place but has a sectoral percentage distribution to GRDP that is smaller than the percentage distribution of the same sector to GRDP in the benchmark area.

Underdeveloped Sector is a sector in the analysis area that has a lower economic growth rate than the economic growth rate of the same industry in the benchmark place and has a sectoral

percentage distribution to GRDP that is also smaller than the percentage distribution of the same sector to GRDP in the benchmark area.

#### 4. RESULTS AND DISCUSSION

[5] reveals that a high level of structural and sectoral change is related to economic growth. Some of the main components of these structural changes include a gradual shift from activities in the agricultural sector to activities in the non-agricultural sector and from the industrial sector to services. The impact of the development of an area related to changes in which sectors experience an increase or decrease becomes a critical issue in the development of a region.

The magnitude of each industry's percentage distribution to the structure of the GRDP of each district/city shows that region's potential or economic system. From Table 2, it can be seen that almost all the towns/regencies in Riau Province still rely on agriculture and mining as their primary business fields to drive the wheels of the economy. Meanwhile, Pelalawan, Siak, and Dumai rely on the processing industry business sector, and Pekanbaru depends on the trade business field. Regencies that are still supported by agricultural business fields are Kuansing, Inhu, Inhil, Kampar, Rohul, and Kepulauan Meranti. Meanwhile, the mining business field is very dominant in Bengkalis, which reaches 63.15 percent, and Rokan Hilir at 39.29 percent.

Indragiri Hulu Regency, the mining sector is no longer the third largest sector in contributing to the GRDP of Indragiri Hulu Regency but is replaced by the construction sector. Pelalawan Regency, where the trade sector ranks third, replacing the mining sector in providing added value to the GRDP of Pelalawan Regency. Siak Regency, the three main sectors that made the most significant contribution in 2012 and 2022 are still the same: agriculture, mining, and industry. However, the mining sector, which in 2012 was at the top of the list with a contribution of more than 50 percent, will decline quite drastically in 2022 and be replaced by the industrial sector. With the agricultural sector, Kampar and Kepulauan Meranti districts, in 2022, will again provide the most excellent added value replacing the mining sector.

Table 2. Contribution of the Three Main Sectors to Forming District/City GRDP in Riau Province (Percent), 2012 and 2022

| Regency/City    | In 2012              |                       |                       | In 2022              |                       |                       |
|-----------------|----------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|
|                 | I                    | II                    | III                   | I                    | II                    | III                   |
| (1)             | (2)                  | (3)                   | (4)                   | (5)                  | (6)                   | (7)                   |
| Kuansing        | Agriculture<br>47.76 | Industry<br>25.26     | Mining<br>10.10       | Agriculture<br>48.58 | Industry<br>27.64     | Mining<br>7.60        |
| Indragiri Hulu  | Agriculture<br>28.11 | Industry<br>24.59     | Mining<br>19.13       | Agriculture<br>29.32 | Industry<br>27.34     | Construction<br>13.10 |
| Indragiri Hilir | Agriculture<br>49.88 | Industry<br>25.06     | Trading<br>13.21      | Agriculture<br>46.10 | Industry<br>25.06     | Trading<br>14.89      |
| Pelalawan       | Industry<br>50.12    | Agriculture<br>38.24  | Mining<br>3.16        | Industry<br>49.14    | Agriculture<br>39.95  | Trading<br>2.79       |
| Siak            | Mining<br>53.18      | Industry<br>26.42     | Agriculture<br>14.05  | Industry<br>38.75    | Mining<br>29.24       | Agriculture<br>21.88  |
| Kampar          | Mining<br>42.72      | Agriculture<br>24.05  | Industry<br>21.03     | Agriculture<br>30.69 | Mining<br>30.43       | Industry<br>24.45     |
| Rokan Hulu      | Agriculture<br>54.85 | Industry<br>21.47     | Mining<br>7.24        | Agriculture<br>54.70 | Industry<br>26.15     | Mining<br>4.88        |
| Bengkalis       | Mining<br>82.33      | Industry<br>6.79      | Agriculture<br>5.36   | Mining<br>63.15      | Industry<br>14.77     | Agriculture<br>10.22  |
| Rokan Hilir     | Mining<br>55.68      | Agriculture<br>24.73  | Industry<br>13.90     | Mining<br>39.29      | Agriculture<br>33.28  | Industry<br>20.43     |
| Kep. Meranti    | Mining<br>34.78      | Agriculture<br>30.57  | Industry<br>20.73     | Agriculture<br>36.33 | Industry<br>24.47     | Mining<br>21.17       |
| Pekanbaru       | Trading<br>28.85     | Construction<br>28.80 | Industry<br>20.60     | Trading<br>30.76     | Construction<br>29.10 | Industry<br>21.11     |
| Dumai           | Industry<br>49.30    | Trading<br>20.37      | Construction<br>12.33 | Industry<br>61.80    | Trading<br>14.09      | Construction<br>10.01 |

Source: Central Bureau of Statistics

[9] defines structural change as the structural transformation in demand, trade, production and use of factors of production necessary for economic growth to remain stable. In a general equilibrium system, the characteristics and timing of the industrialization process are affected by changes in domestic demand, shifts in comparative advantage, sectoral productivity growth, and accumulation of capital goods.

According to [6], the economic structure is the formation or configuration of an economic design. The industry with the largest share has the highest position in the system and becomes the trademark of an economy. The availability of Natural Resources and Human Resources (HR) in a region greatly influences the economic structure of that region so that economic activities vary in each area. Meanwhile, the role of secondary economic activity in driving the wheels of the economy is no less important because it indicates that the manufacturing industry has more capacity to drive the economy in the region. Therefore, to maintain the continuity of the performance of the processing industry business field, it must always be supported by the ease of availability of raw materials and adequate infrastructure. This condition occurs in Pelalawan Regency and Dumai City. Meanwhile, tertiary economic activities, representing business services, play a dominant role in Pekanbaru City. This is closely related to Pekanbaru City as the provincial capital and a trade and service centre in Riau Province. In 2022, the role of the tertiary sector in the Pekanbaru City economy will reach 47.99 percent, the highest in Riau Province.

Table 3. Regency/City Economic Structure in Riau Province According to Economic Activities Primary, Secondary, Tertiary (Percent), 2022

| Regency/City      | 2012    |           |          | 2022    |           |          |
|-------------------|---------|-----------|----------|---------|-----------|----------|
|                   | Primary | Secondary | Tertiary | Primary | Secondary | Tertiary |
| (1)               | (2)     | (3)       | (4)      | (5)     | (6)       | (7)      |
| Kuansing          | 57.86   | 32.61     | 9.53     | 56.18   | 35.15     | 8.67     |
| Indragiri Hulu    | 47.23   | 36.70     | 16.07    | 42.28   | 40.54     | 17.18    |
| Indragiri Hilir   | 50.34   | 30.14     | 19.52    | 48.51   | 30.87     | 20.62    |
| Pelalawan         | 41.41   | 51.99     | 6.60     | 42.38   | 51.43     | 6.19     |
| Siak              | 67.23   | 29.54     | 3.23     | 51.12   | 43.62     | 5.26     |
| Kampar            | 66.77   | 26.51     | 6.72     | 61.12   | 31.45     | 7.43     |
| Rokan Hulu        | 62.09   | 24.89     | 13.02    | 59.57   | 29.44     | 10.99    |
| Bengkalis         | 87.69   | 8.09      | 4.22     | 73.37   | 17.74     | 8.89     |
| Rokan Hilir       | 80.41   | 14.55     | 5.04     | 72.57   | 21.40     | 6.03     |
| Kepulauan Meranti | 65.35   | 23.45     | 11.20    | 57.50   | 29.20     | 13.30    |
| Pekanbaru         | 1.68    | 49.59     | 48.73    | 1.57    | 50.44     | 47.99    |
| Dumai             | 7.06    | 61.69     | 31.25    | 5.75    | 72.14     | 22.11    |

Source: Central Bureau of Statistics (processed)

Table 3 shows the economic structure of the regencies/cities in Riau Province according to the main economic activities, namely primary, secondary, and tertiary economic activities. It can be seen that most of the economy in regencies/cities in Riau Province is driven by primary economic activities (including agricultural and mining business fields). This condition occurs in the districts of Kuansing, Indragiri Hulu, Indragiri Hilir, Siak, Kampar, Rokan Hulu, Bengkalis, Rokan Hilir, and Kepulauan Meranti.

Research that analyzes the structure of the economy in Riau has been conducted by [11], [12]. Asnawi determines Riau's leading sector using the 2001 Input Output (IO) Table. The results show that the top industry in Riau is the manufacturing and building sectors, with a degree of sensitivity more incredible than one. Meanwhile, the manufacturing sector is a driving force for economic growth because the contribution of this sector is substantial. Raden identified potential economic sectors in Riau with GRDP data for 2006-2012. The method used is location quotient and gravity index. The location quotient results show that the mining and quarrying sector is the leading sector in Siak, Bengkalis, and Rokan Hilir. The agricultural sector is superior in Kuansing, Indragiri Hulu, Indragiri Hilir, Pelalawan, Rokan Hulu, and Kampar. The processing industry sector is the leading sector in Dumai. The services sector is the top sector in Pekanbaru. Based on the gravity index, Bengkalis, Pekanbaru, and Siak can become centres of economic growth in Riau.

[12] analyzed the shifts in the economic structure in Riau Province from 2010-2019 using the Growth Ratio Model and overlay analysis. The results showed that the financial system of Riau Province began to shift from the primary sector to the secondary and tertiary sectors. From the processing results using an analysis of competitive advantage and specialization from Esteban Marquillass, as shown in Table 4 below, it can be shown that the agricultural industry is a sector that has both competitive advantage and specialization in 6 districts in Riau, namely Kuansing, Inhu, Inhil, Pelalawan, Kampar, and Rohul. The economy of a region is said to be specialized in an area which makes the development of an economic sector the main thing to do through various policies to improve that sector. The effect of these priority sectors can be carried out through increasing investment programs and human resources. Meanwhile, no single economic sector simultaneously has competitive advantages and specialization in Rokan Hilir, Kepulauan Meranti, Siak, and Bengkalis. Meanwhile, the trade sector is a sector that has both a competitive advantage and specialization in Pekanbaru City. In contrast, the industrial sector is a sector that has both a competitive advantage and specialization in Dumai City. The role of the processing industry is increasing due to the increasing demand for fuel products and refined CPO (Crude Palm Oil) effects and is supported by rising prices for products produced from the processing industry category in general. Dumai City is a city that has an oil refinery and is also an area that is a centre for processing CPO and its derivatives in Riau Province. In comparison, the industrial sector is a sector that has a

competitive advantage and specialization at the same time in the City of Dumai. The role of the processing industry is increasing due to the increasing demand for fuel products and refined CPO (Crude Palm Oil) effects and is supported by rising prices for products produced from the processing industry category in general. Dumai City is a city that has an oil refinery and is also an area that is a centre for processing CPO and its derivatives in Riau Province. At the same time, the industrial sector is a sector that has a competitive advantage and specialization at the same time in the City of Dumai. The role of the processing industry is increasing due to the increasing demand for fuel products and refined CPO (Crude Palm Oil) effects and is supported by rising prices for products produced from the processing industry category in general. Dumai City is a city that has an oil refinery and is also an area that is a centre for processing CPO and its derivatives in Riau Province.

Table 4. Identification of Competitive Advantage and Economic Specialization Regencies/Cities in Riau Province in 2022

| Sektor                                                               | Kuantan Singingi |            |                       |                | Indragiri Hulu |            |                       |                | Indragiri Hilir |            |                       |                | Pelalawan |            |                       |                |
|----------------------------------------------------------------------|------------------|------------|-----------------------|----------------|----------------|------------|-----------------------|----------------|-----------------|------------|-----------------------|----------------|-----------|------------|-----------------------|----------------|
|                                                                      | rij - rin        | Eij - E*ij | Competitive Advantage | Specialization | rij - rin      | Eij - E*ij | Competitive Advantage | Specialization | rij - rin       | Eij - E*ij | Competitive Advantage | Specialization | S         | Eij - E*ij | Competitive Advantage | Specialization |
| Agriculture, Forestry and Fisheries                                  | 0.08             | 5531.3     | √                     | √              | 0.38           | 1040.5     | √                     | √              | 1.52            | 9447.8     | √                     | √              | 0.3       | 3740       | √                     | √              |
| Mining and Quarrying                                                 | 20.03            | -6000.3    | √                     | ×              | 4.04           | -6007.9    | √                     | ×              | 26.89           | -12821     | √                     | ×              | -0.91     | -9824.2    | ×                     | ×              |
| Manufacturing                                                        | -0.44            | 963.37     | ×                     | √              | -0.88          | 1377.6     | ×                     | √              | -0.05           | 108.47     | ×                     | √              | -0.02     | 9599.9     | ×                     | √              |
| Electricity and Gas                                                  | 5.47             | -7068.3    | √                     | ×              | -9.14          | -8481.4    | ×                     | ×              | -4.96           | -13492     | ×                     | ×              | -2.72     | -10409     | ×                     | ×              |
| Water supply, Sewerage, Waste Management and Remediation Activities  | -4.26            | -7075.8    | ×                     | ×              | -0.8           | -8482.8    | ×                     | ×              | -1.62           | -13509     | ×                     | ×              | 0.24      | -10419     | √                     | ×              |
| Construction                                                         | 2.45             | -5313.7    | √                     | ×              | -0.81          | -4666.4    | ×                     | ×              | 0.72            | -11025     | √                     | ×              | 2.47      | -9571.7    | √                     | ×              |
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | 0.06             | -6145.7    | √                     | ×              | -0.98          | -5594.6    | ×                     | ×              | -4.18           | -6863.7    | ×                     | ×              | 1.25      | -9402.6    | √                     | ×              |
| Transportation and Storage                                           | 0.96             | -6957      | √                     | ×              | -2.74          | -8227.6    | ×                     | ×              | -8.78           | -13088     | ×                     | ×              | 0.3       | -10341     | √                     | ×              |
| Accommodation and Food Service Activities                            | -0.36            | -7029.5    | ×                     | ×              | -0.27          | -8277.9    | ×                     | ×              | 1.2             | -13301     | √                     | ×              | 2.54      | -10363     | √                     | ×              |
| Information and Communication                                        | -0.06            | -6964.1    | ×                     | ×              | -0.59          | -8231.3    | ×                     | ×              | -2.29           | -13156     | ×                     | ×              | -1.23     | -10177     | ×                     | ×              |
| Financial and Insurance Activities                                   | -0.01            | -6943.7    | ×                     | ×              | -0.06          | -8223.9    | ×                     | ×              | -0.99           | -13243     | ×                     | ×              | -1.06     | -10223     | ×                     | ×              |
| Real Estate Activities                                               | -0.47            | -6903.8    | ×                     | ×              | -0.02          | -8116      | ×                     | ×              | -1.1            | -13120     | ×                     | ×              | 0.68      | -10189     | √                     | ×              |
| Business Activities                                                  | -0.12            | -7080.5    | ×                     | ×              | -7.95          | -8497.8    | ×                     | ×              | 2.36            | -13516     | √                     | ×              | 0.21      | -10421     | √                     | ×              |
| Public Administration and Defence; Compulsory Social Security        | -5.28            | -6521.3    | ×                     | ×              | -6.44          | -7985.7    | ×                     | ×              | -2.09           | -12711     | ×                     | ×              | -0.71     | -10034     | ×                     | ×              |
| Education                                                            | -0.03            | -6940.7    | ×                     | ×              | 0.05           | -8272.5    | √                     | ×              | -0.7            | -13275     | ×                     | ×              | -0.54     | -10311     | ×                     | ×              |
| Human Health and Social Work Activities                              | -0.1             | -7030.4    | ×                     | ×              | -0.03          | -8427.6    | ×                     | ×              | -1.27           | -13436     | ×                     | ×              | -1.14     | -10364     | ×                     | ×              |
| Other Services Activities                                            | -0.2             | -6978.7    | ×                     | ×              | -0.42          | -8299.2    | ×                     | ×              | 2.54            | -13318     | √                     | ×              | 4.21      | -10319     | √                     | ×              |

| Sektor                                                               | Siak      |            |                       |                | Kampar    |            |                       |                | Rokan Hulu |            |                       |                | Bengkalis |            |                       |                |
|----------------------------------------------------------------------|-----------|------------|-----------------------|----------------|-----------|------------|-----------------------|----------------|------------|------------|-----------------------|----------------|-----------|------------|-----------------------|----------------|
|                                                                      | rij - rin | Eij - E*ij | Competitive Advantage | Specialization | rij - rin | Eij - E*ij | Competitive Advantage | Specialization | rij - rin  | Eij - E*ij | Competitive Advantage | Specialization | rij - rin | Eij - E*ij | Competitive Advantage | Specialization |
| Agriculture, Forestry and Fisheries                                  | 0.26      | -1294.1    | √                     | ×              | 1.95      | 3792.77    | √                     | √              | 2.21       | 7464.96    | √                     | √              | -1.78     | -10669     | ×                     | ×              |
| Mining and Quarrying                                                 | -0.01     | -5463.1    | ×                     | ×              | 1.58      | -4359.6    | √                     | ×              | 0.48       | -6716.5    | √                     | ×              | -1.55     | 18164.9    | ×                     | √              |
| Manufacturing                                                        | -0.47     | 10927.2    | ×                     | √              | -0.33     | 2059.97    | ×                     | √              | -0.38      | 115.046    | ×                     | √              | -0.62     | -4845.4    | ×                     | ×              |
| Electricity and Gas                                                  | -3.07     | -15462     | ×                     | ×              | -4.2      | -15204     | ×                     | ×              | -9.1       | -7654.7    | ×                     | ×              | -6.91     | -20710     | ×                     | ×              |
| Water supply, Sewerage, Waste Management and Remediation Activities  | -1.38     | -15465     | ×                     | ×              | 3.54      | -15234     | √                     | ×              | -0.96      | -7674.5    | ×                     | ×              | 0.14      | -20720     | √                     | ×              |
| Construction                                                         | 0.94      | -12871     | √                     | ×              | 3.75      | -11410     | √                     | ×              | 2.2        | -6845.7    | √                     | ×              | 1.99      | -18107     | √                     | ×              |
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | 1.03      | -14183     | √                     | ×              | 2.04      | -13311     | √                     | ×              | 0.8        | -6310.3    | √                     | ×              | 0.45      | -15327     | √                     | ×              |
| Transportation and Storage                                           | -4.59     | -15392     | ×                     | ×              | 0.85      | -15039     | √                     | ×              | -2.53      | -7533.2    | ×                     | ×              | -3.57     | -20517     | ×                     | ×              |
| Accommodation and Food Service Activities                            | 2.33      | -15441     | √                     | ×              | -1.05     | -15190     | ×                     | ×              | -0.65      | -7608.5    | ×                     | ×              | 2.36      | -20518     | √                     | ×              |
| Information and Communication                                        | -0.95     | -15268     | ×                     | ×              | -0.11     | -14957     | ×                     | ×              | -2.99      | -7335.3    | ×                     | ×              | -0.73     | -20247     | ×                     | ×              |
| Financial and Insurance Activities                                   | -1.27     | -15238     | ×                     | ×              | -1.15     | -14966     | ×                     | ×              | -1.7       | -7431.8    | ×                     | ×              | -1.02     | -20465     | ×                     | ×              |
| Real Estate Activities                                               | -0.69     | -15199     | ×                     | ×              | 0.41      | -14665     | √                     | ×              | -0.92      | -7500.4    | ×                     | ×              | 0.68      | -20441     | √                     | ×              |
| Business Activities                                                  | 1.02      | -15464     | √                     | ×              | -0.14     | -15236     | ×                     | ×              | -0.02      | -7675.3    | ×                     | ×              | 5.91      | -20730     | √                     | ×              |
| Public Administration and Defence; Compulsory Social Security        | 0.47      | -14907     | √                     | ×              | -6.36     | -14434     | ×                     | ×              | -6.65      | -6948.6    | ×                     | ×              | 2.93      | -19833     | √                     | ×              |
| Education                                                            | 0.17      | -15153     | √                     | ×              | 0.05      | -14936     | √                     | ×              | -0.01      | -7571.6    | ×                     | ×              | -0.61     | -20474     | ×                     | ×              |
| Human Health and Social Work Activities                              | -0.51     | -15319     | ×                     | ×              | -0.03     | -15112     | ×                     | ×              | 0.64       | -7617.7    | √                     | ×              | -1        | -20644     | ×                     | ×              |
| Other Services Activities                                            | 4.19      | -15145     | √                     | ×              | -0.26     | -15070     | ×                     | ×              | -2.42      | -7560.8    | ×                     | ×              | 6.62      | -20505     | √                     | ×              |



| Sektor                                                               | Rokan Hilir |            |                       |                | Kep. Meranti |            |                       |                | Pekanbaru |            |                       |                | Dumai     |            |                       |                |
|----------------------------------------------------------------------|-------------|------------|-----------------------|----------------|--------------|------------|-----------------------|----------------|-----------|------------|-----------------------|----------------|-----------|------------|-----------------------|----------------|
|                                                                      | rij - rin   | Eij - E*ij | Competitive Advantage | Specialization | rij - rin    | Eij - E*ij | Competitive Advantage | Specialization | rij - rin | Eij - E*ij | Competitive Advantage | Specialization | rij - rin | Eij - E*ij | Competitive Advantage | Specialization |
| Agriculture, Forestry and Fisheries                                  | -0.57       | 5305.81    | x                     | v              | -0.92        | 1645.3     | x                     | v              | -0.46     | -20044     | x                     | x              | -2.68     | -6222.6    | x                     | x              |
| Mining and Quarrying                                                 | -1.18       | 152.71     | x                     | v              | 3.31         | -2080      | v                     | x              | 0.27      | -21176     | v                     | x              | 0.7       | -7496.3    | v                     | x              |
| Manufacturing                                                        | -0.71       | -1519.2    | x                     | x              | -3.5         | 286.315    | x                     | v              | -2.33     | -4510.1    | x                     | x              | 2.99      | 9665.18    | v                     | v              |
| Electricity and Gas                                                  | -6.77       | -13092     | x                     | x              | -3.25        | -3661.6    | x                     | x              | -9.98     | -21001     | x                     | x              | 28.54     | -7493.3    | v                     | x              |
| Water supply, Sewerage, Waste Management and Remediation Activities  | -1.02       | -13101     | x                     | x              | -4.7         | -3666.7    | x                     | x              | -3.52     | -21174     | x                     | x              | 3.64      | -7571.1    | v                     | x              |
| Construction                                                         | -0.73       | -12466     | x                     | x              | 2.05         | -3055.2    | v                     | x              | -0.22     | 432.652    | x                     | v              | 0.15      | -5073.8    | v                     | x              |
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | -1.34       | -10453     | x                     | x              | -4.43        | -2530      | x                     | x              | 0.79      | 1233.59    | v                     | v              | -8.57     | -3373.7    | x                     | x              |
| Transportation and Storage                                           | -7.68       | -13030     | x                     | x              | 1.5          | -3447.7    | v                     | x              | 6.06      | -19538     | v                     | x              | -9.44     | -7065.7    | x                     | x              |
| Accommodation and Food Service Activities                            | -1.38       | -13014     | x                     | x              | 1.32         | -3634.6    | v                     | x              | 0.99      | -20020     | v                     | x              | -6.32     | -7394.6    | x                     | x              |
| Information and Communication                                        | -2.72       | -12938     | x                     | x              | -0.16        | -3559.8    | x                     | x              | -2.68     | -18065     | x                     | x              | -4        | -7215.4    | x                     | x              |
| Financial and Insurance Activities                                   | -0.93       | -12920     | x                     | x              | 0.13         | -3627.1    | v                     | x              | 0.6       | -18343     | v                     | x              | 0.07      | -7268.6    | v                     | x              |
| Real Estate Activities                                               | -1.6        | -12906     | x                     | x              | 0.62         | -3603      | v                     | x              | -0.29     | -19029     | x                     | x              | -0.13     | -7456.5    | x                     | x              |
| Business Activities                                                  | -0.71       | -13105     | x                     | x              | 6.26         | -3666.9    | v                     | x              | 0.48      | -21174     | v                     | x              | -11.45    | -7574.8    | x                     | x              |
| Public Administration and Defence; Compulsory Social Security        | 1.83        | -12719     | v                     | x              | 0.28         | -3400.8    | v                     | x              | -1.17     | -18759     | x                     | x              | 3.06      | -7093.7    | v                     | x              |
| Education                                                            | -1.81       | -12956     | x                     | x              | -0.47        | -3640.2    | x                     | x              | 0.47      | -20421     | v                     | x              | -1.74     | -7461.9    | x                     | x              |
| Human Health and Social Work Activities                              | -0.38       | -13062     | x                     | x              | -1.21        | -3657.5    | x                     | x              | -0.71     | -20621     | x                     | x              | 1.91      | -7522.8    | v                     | x              |
| Other Services Activities                                            | -0.71       | -13004     | x                     | x              | 5.7          | -3624.5    | v                     | x              | -6.41     | -20431     | x                     | x              | 0.19      | -7444.7    | v                     | x              |

Source: Central Bureau of Statistics (processed)

According to [8], changes in the economic system or structural transformation are characterized by several characteristics, namely: Economic growth is more remarkable than population growth, the share of the primary sector will decrease, the percentage distribution of the secondary sector is increasing, and the share of the tertiary industry is relatively constant. Consumption of basic needs decreased that known as Engel's Law. The implication is that the role of the primary sector on the production side decreases, and the part of consumption factors on the demand side decreases while the industrial and investment sectors increase.

The results of the Klassen typology, as seen from the growth rate and contribution of the district/city and Riau Province economic sector in 2012 and 2022, are shown in Table 5. It can be seen that the agricultural industry in Kuansing, Inhu, and Kampar Regencies, which in 2012 was a growing sector, 2022 will shift to become a mainstay sector. In contrast, in Bengkalis, Pekanbaru, and Dumai Regencies, this sector is still one of the lagging economic sectors. The mining and quarrying sector is a potential sector in Kuansing, Inhu, Inhil, Rohul, Kepulauan Meranti, Pekanbaru, and Dumai. Even in Kampar District, this sector is still becoming the leading sector. Meanwhile, the industrial sector is the mainstay sector in Dumai City. Still, it is an underdeveloped sector in most areas of Riau Province, such as Inhu, Inhil, Kampar, Rohul, Bengkalis, Rohil, Kepulauan Meranti, and Pekanbaru. The trade sector is the mainstay sector only in Pekanbaru City.

In 2022, many economic sectors in Pekanbaru and Dumai will become the mainstay sector. In contrast to other districts in Riau Province, which only have 1-3 mainstay sectors, even in Rokan Hilir Regency, none of the economic sectors will become the mainstay sector. In 2012, the primary sector, which included agriculture, forestry, fisheries, mining, and quarrying, was once the mainstay sector. Still, in 2022 it will turn into a developing industry.

Table 5. Shifts in District/City Economic Sector in Riau Province Based on Klassen Typology Analysis, 2012 – 2022

| Sektor                                                               | Kuantan Singingi |      | Indragiri Hulu |      | Indragiri Hilir |      | Pelalawan |      |
|----------------------------------------------------------------------|------------------|------|----------------|------|-----------------|------|-----------|------|
|                                                                      | 2012             | 2022 | 2012           | 2022 | 2012            | 2022 | 2012      | 2022 |
| Agriculture, Forestry and Fisheries                                  | II               | I    | II             | I    | I               | I    | I         | I    |
| Mining and Quarrying                                                 | IV               | IV   | III            | IV   | IV              | IV   | IV        | III  |
| Manufacturing                                                        | I                | II   | III            | III  | I               | III  | II        | II   |
| Electricity and Gas                                                  | III              | IV   | III            | III  | I               | III  | IV        | III  |
| Water supply, Sewerage, Waste Management and Remediation Activities  | I                | II   | II             | II   | I               | II   | I         | IV   |
| Construction                                                         | II               | IV   | III            | II   | IV              | IV   | IV        | IV   |
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | III              | IV   | II             | II   | II              | III  | III       | II   |
| Transportation and Storage                                           | III              | IV   | II             | II   | II              | II   | III       | IV   |
| Accommodation and Food Service Activities                            | III              | III  | III            | II   | II              | IV   | III       | IV   |
| Information and Communication                                        | III              | III  | II             | III  | I               | III  | III       | III  |
| Financial and Insurance Activities                                   | IV               | III  | II             | II   | IV              | III  | IV        | II   |
| Real Estate Activities                                               | IV               | III  | II             | II   | II              | III  | IV        | IV   |
| Business Activities                                                  | II               | II   | I              | II   | II              | I    | II        | I    |
| Public Administration and Defence; Compulsory Social Security        | I                | II   | III            | III  | I               | II   | IV        | III  |
| Education                                                            | I                | II   | III            | I    | I               | II   | IV        | III  |
| Human Health and Social Work Activities                              | II               | III  | II             | III  | III             | III  | III       | III  |
| Other Services Activities                                            | II               | III  | III            | II   | II              | IV   | IV        | IV   |

| Sektor                                                               | Siak |      | Kampar |      | Rokan Hulu |      | Bengkalis |      |
|----------------------------------------------------------------------|------|------|--------|------|------------|------|-----------|------|
|                                                                      | 2012 | 2022 | 2012   | 2022 | 2012       | 2022 | 2012      | 2022 |
| Agriculture, Forestry and Fisheries                                  | III  | IV   | II     | I    | I          | I    | III       | III  |
| Mining and Quarrying                                                 | I    | II   | I      | I    | III        | IV   | II        | II   |
| Manufacturing                                                        | II   | II   | I      | III  | I          | III  | IV        | III  |
| Electricity and Gas                                                  | IV   | III  | II     | III  | I          | II   | IV        | III  |
| Water supply, Sewerage, Waste Management and Remediation Activities  | IV   | III  | II     | IV   | I          | III  | II        | I    |
| Construction                                                         | IV   | IV   | IV     | IV   | III        | IV   | IV        | IV   |
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | IV   | IV   | III    | IV   | III        | IV   | IV        | IV   |
| Transportation and Storage                                           | IV   | III  | III    | IV   | III        | III  | III       | III  |
| Accommodation and Food Service Activities                            | IV   | IV   | III    | III  | III        | III  | IV        | IV   |
| Information and Communication                                        | III  | III  | III    | III  | II         | II   | IV        | III  |
| Financial and Insurance Activities                                   | III  | III  | III    | III  | I          | III  | III       | III  |
| Real Estate Activities                                               | III  | III  | I      | I    | II         | III  | III       | IV   |
| Business Activities                                                  | I    | I    | II     | II   | II         | II   | I         | I    |
| Public Administration and Defence; Compulsory Social Security        | IV   | IV   | I      | III  | I          | II   | III       | IV   |
| Education                                                            | III  | I    | II     | II   | II         | III  | IV        | III  |
| Human Health and Social Work Activities                              | III  | II   | II     | III  | II         | II   | IV        | III  |
| Other Services Activities                                            | IV   | I    | III    | III  | II         | III  | III       | IV   |

| Sektor                                                               | Rokan Hilir |      | Kep. Meranti |      | Pekanbaru |      | Dumai |      |
|----------------------------------------------------------------------|-------------|------|--------------|------|-----------|------|-------|------|
|                                                                      | 2012        | 2022 | 2012         | 2022 | 2012      | 2022 | 2012  | 2022 |
| Agriculture, Forestry and Fisheries                                  | I           | II   | I            | II   | IV        | III  | III   | III  |
| Mining and Quarrying                                                 | I           | II   | III          | IV   | IV        | IV   | IV    | IV   |
| Manufacturing                                                        | IV          | III  | I            | III  | I         | III  | II    | I    |
| Electricity and Gas                                                  | IV          | III  | IV           | III  | II        | II   | I     | I    |
| Water supply, Sewerage, Waste Management and Remediation Activities  | IV          | III  | IV           | III  | II        | II   | I     | I    |
| Construction                                                         | IV          | III  | IV           | IV   | II        | II   | I     | I    |
| Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles | III         | III  | IV           | VI   | I         | I    | II    | II   |
| Transportation and Storage                                           | III         | III  | I            | I    | I         | I    | II    | II   |
| Accommodation and Food Service Activities                            | III         | III  | III          | IV   | I         | I    | I     | II   |
| Information and Communication                                        | III         | III  | III          | IV   | I         | II   | I     | II   |
| Financial and Insurance Activities                                   | III         | III  | IV           | IV   | II        | I    | I     | I    |
| Real Estate Activities                                               | III         | III  | IV           | IV   | I         | II   | III   | III  |
| Business Activities                                                  | II          | II   | I            | I    | I         | I    | II    | II   |
| Public Administration and Defence; Compulsory Social Security        | III         | IV   | I            | I    | I         | II   | II    | I    |
| Education                                                            | IV          | III  | III          | III  | II        | I    | I     | III  |
| Human Health and Social Work Activities                              | III         | III  | III          | III  | I         | II   | II    | IV   |
| Other Services Activities                                            | III         | III  | III          | IV   | II        | II   | II    | I    |

Source: Central Bureau of Statistics (processed)

## CONCLUSION

The agricultural sector is still a pillar of the economy in most districts/cities in Riau, so development programs should be more directed at programs that boost the ability of the agricultural industry, such as developing products that have export opportunities, promoting investment and trade, developing integrated economic zones and production centre areas through the development of leading and potential sectors. In addition, all funding resources owned by the regions need to be focused on developing leading sectors to synergize with other sectors so that they can become generators of Regional Original Income (PAD). To increase GRDP, Regional Governments should not ignore other sectors not included in the leading sectors. Industries that are not potential still need to be developed gradually, and this is because development in one sector will affect growth in other sectors.

## REFERENCES

- [1] S. M. Vasin, "Sectoral transformation of the economic system during crisis and stable growth periods (A case study of the European countries)," *Economies*, vol. 10, no. 6, p. 148, 2022.
- [2] N. Rinaldi, E. Erfit, and R. Rosmeli, "Transformasi Struktural Perekonomian Indonesia," *J. Ekon. Aktual*, vol. 1, no. 3, pp. 117–126, 2022.
- [3] D. Tampobolon, "Struktur Spatial dan Peralihan Sektoral Kesempatan Kerja di Kabupaten Siak Provinsi Riau," *J. Mandiri*, vol. 2, no. 2, 2007.
- [4] Y. Prawira and W. Hamidi, "Transformasi struktur ekonomi kabupaten siak Tahun 2001-2010," *J. Ekon.*, vol. 21, no. 01, 2013.
- [5] M. P. Todaro and S. C. Smith, *PEMBANGUNAN EKONOMI, edisi 9, jilid 1*. Erlangga, 2006.
- [6] L. Arsyad, "Pengantar perencanaan dan pembangunan ekonomi daerah," (*No Title*), 1999.
- [7] Sjafrizal, *Ekonomi regional: Teori dan aplikasi*. Baduose Media, 2008.
- [8] S. Sukirno, "Ekonomi pembangunan: proses, masalah dan dasar kebijakan," 2006.
- [9] S. Kuznets and J. T. Murphy, *Modern economic growth: Rate, structure, and spread*, vol. 2. Yale University Press New Haven, 1966.
- [10] J. M. Esteban-Marquillas, "I. A reinterpretation of shift-share analysis," *Reg. urban Econ.*, vol. 2, no. 3, pp. 249–255, 1972.
- [11] R. R. Alhemp, H. Zainal, and S. Y. Kusumastuti, "Keterkaitan Sektor-Sektor Ekonomi Potensial di Provinsi Riau," *Mimb. J. Sos. dan Pembang.*, vol. 30, no. 1, pp. 62–71, 2014.
- [12] R. Kurniawan and H. Ekwarso, "ANALISIS PERTUMBUHAN DAN PERGESERAN SEKTOR EKONOMI DI PROVINSI RIAU TAHUN 2010-2019," *Sinergi J. Ekon. Bisnis dan Manaj.*, vol. 1, no. 2, pp. 1–14, 2022.