

Research article

## Specialization and Competitive Advantages of Leading Processing Industry in South Sumatra

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**Abstract:** The contribution of the manufacturing sector to the GRDP of South Sumatra Province is 19.72 percent in 2020. A large percentage of GRDP does not necessarily indicate the potential of the processing industry to become a leading sector, so it is necessary to identify the leading processing industry sector. So that this study aims to identify the competitiveness of the leading processing industry sub-sector. The method used are Static Location Quotients (SLQ), Dynamic Location Quotients (DLQ), Dispersion Power Index (IDP), Sensitivity Index (IDK) which uses an overlay method to identify sub-sectors of the processing industry. Meanwhile, to determine the competitiveness of the leading processing industry sub-sector is using Shift-Share Dynamic analysis. Using the secondary data sourced from the Indonesia Statistics, the input-output table in 2016 and previous study from 2016-2020. The findings show that from the 16 sub-sectors of the processing industry, there are 3 sub-sectors which include the leading processing industry, namely the food and beverage industry; paper and paper goods industry, printing, and reproduction of recording media; and the chemical, pharmaceutical and traditional medicine industries. Food and beverage industry sub-sector; and the paper industry, and paper goods, printing and reproduction of recording media have competitiveness and specialization. Meanwhile, the chemical, pharmaceutical and traditional medicine industries have no specialization but are competitive.

**Keywords:** specialization, leading processing industry, competitiveness, South Sumatra

**JEL Classification:** O12; O14; R11

**Abstrak:** Kontribusi sektor industri pengolahan terhadap PDRB sebesar 19.72 persen pada tahun 2020. Persentase PDRB yang besar tidak serta merta menunjukkan potensi industri pengolahan menjadi sektor unggulan, sehingga perlunya identifikasi sektor industri pengolahan unggulan. Penelitian ini bertujuan untuk menganalisis spesialisasi dan keunggulan kompetitif subsektor industri pengolahan unggulan di Provinsi Sumatera Selatan. Metode yang digunakan adalah Static Location Quotients (SLQ), Dynamic Location Quotients (DLQ), Indeks Daya Penyebaran (IDP), Indeks Derajat Kepekaan (IDK) yang menggunakan metode overlay untuk identifikasi subsektor industri pengolahan. Untuk penentuan daya saing subsektor industri pengolahan unggulan menggunakan analisis Shift-Share Dynamic. Menggunakan data sekunder yang bersumber dari Badan Pusat Statistik, tabel input-output tahun 2016, dan penelitian terdahulu dari 2016-2020. Hasil temuan menunjukkan bahwa dari 16 subsektor industri pengolahan terdapat 3 subsektor yang termasuk industri pengolahan unggulan adalah Industri makanan dan minuman; industri kertas dan barang dari kertas, percetakan dan reproduksi media rekaman; serta industri kimia, farmasi dan obat tradisional. Subsektor industri makanan dan minuman; dan industri kertas, dan barang dari kertas, percetakan dan reproduksi media rekaman memiliki daya saing dan spesialisasi. Sedangkan industri kimia, farmasi dan obat tradisional tidak ada spesialisasi tetapi memiliki daya saing.

**Kata kunci:** spesialisasi, industri pengolahan unggulan, daya saing, Sumatera Selatan

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### How to Cite:

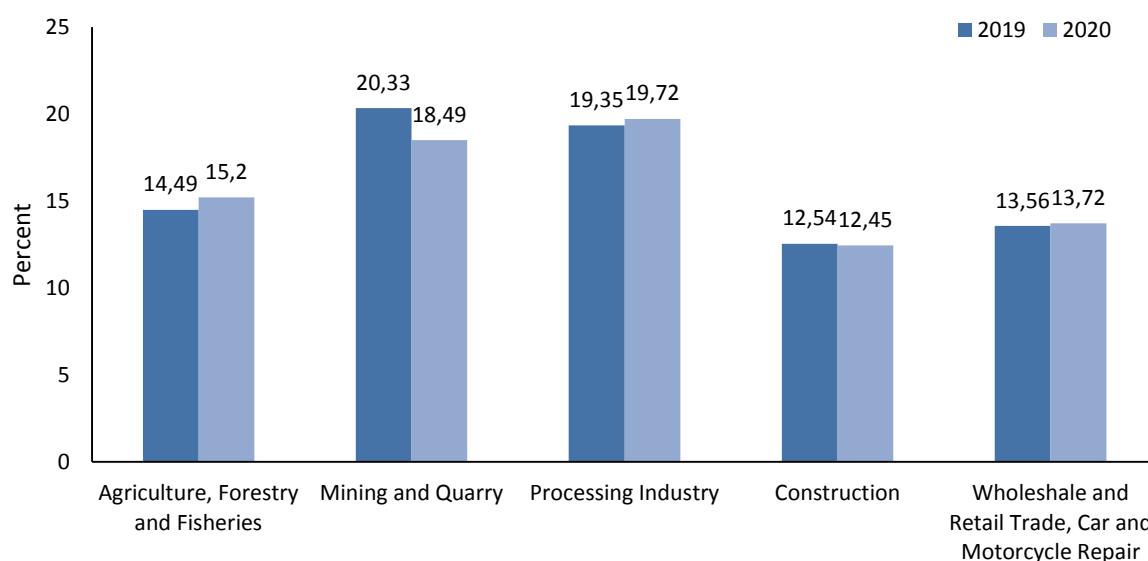
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## 1. INTRODUCTION

Regional development essentially emphasizes development policies that are able to take advantage of the uniqueness of its resources, be it natural resources, human resources, institutions, and the physical infrastructure of the region (Pambudi et al., 2022). In achieving the goals and objectives to improve community welfare, regional development involves all existing activities through community support in various sectors (Hasanah et al., 2021; Alwi et al., 2021). The ability of local governments to analyze sectors that have advantages and disadvantages in their area is becoming increasingly important (Akmadani & Tampubolon, 2021). In addition, the role of the sector is to be a driver of a region's GRDP (Masruri & Ruhjana, 2021).

The sector that has advantages with better prospects for development and is expected to be able to encourage other sectors is the industrial sector. The industrial sector is able to overcome economic problems (Rahmah & Widodo, 2019). One of them is increasing new job opportunities (Atack et al., 2021). Thus, the industrial sector is better prepared to become a leading sector for the development of other economic sectors (Drajat et al., 2021).



**Figure 1.** Distribution of GRDP by 5 largest business fields in South Sumatra in 2020

**Source:** Indonesian statistics, 2020 (data processed)

South Sumatra is one of the developed regions on Sumatra Island which has enormous potential. With the potential for large natural resources, it makes a province with a rapidly growing economy (Amelia & Guswandi, 2022). One sector that has the potential is the processing industry (Saputri & Boedi, 2018). The processing industry sector is the highest contributor to GRDP in 2020, which is 19.72 percent (Tauhid & Mutaqien, 2021).

Figure 1 reports that South Sumatra's economic contribution is dominated by 5 sectors. However, the largest contributor to GRDP is the mining and quarrying sector; manufacturing industry sector; and the agriculture, forestry, and fisheries sectors. These three sectors experience significant changes every year. In 2019 the mining and quarrying sector became the most dominant sector, but in 2020 it decreased to 18.49 percent from the previous year. This decline was caused by limited natural and mineral resources and cannot be renewed, on the other hand mining and quarrying exports have decreased due to the Covid-19 pandemic (Statistics Indonesia, 2020). The agriculture, forestry and fishery sectors also experienced an increase in 2020 by 15.20 percent, but the increase was relatively lower than the manufacturing industry sector, which increased by 19.72 percent. The shift in the contribution can be interpreted that there has been a transformation of structural changes from the primary sector, namely mining and quarrying; and agriculture, forestry, and fisheries) to the secondary sector, namely the processing industry (Rosiana, 2019).

This transformation of structural changes is evident after calculating the structural changes as done by Hill et al. (2008), the results of the structural changes in 2016-2020 are the largest from the manufacturing industry sector (0.78%); the mining and extraction (-1.22%); and agriculture, forestry and fisheries (-1.50%). However, study by Rosiana (2019), found that economic transformation in the form of an increase in the contribution of GRDP in the industrial sector in South Sumatra Province did not go in the same direction as employment in the industrial sector. This is possible because the larger an industry, the more sophisticated technology will be used so that the use of labor in the industrial sector will be reduced. According to Rahmah & Widodo (2019) found that the manufacturing industry sector has a major role to support a fairly high economic growth every year, it can expand business fields, job opportunities and so on. Additionally, according to Indonesian Statistic (2020) throughout 2020, the total exports of the processing industry sector reached USD.2,781.87 million or contributed 77.18 percent to the total exports of South Sumatra.

This is also reinforced by the Regulation Number 1 of 2019 concerning the Regional Medium-Term Development Plan (RPJMD) of South Sumatra Province for 2019-2023 that the manufacturing sector is an important goal in increasing an inclusive economy based on regional innovation with a strategy of exploring economic resources. Through the processing industry, facilitating the development of the processing industry from the potential of the community to provide the widest possible employment opportunities and a greater and more equitable level of worker income. With policy directions or development targets to accelerate the functioning of Special Economic Zones (SEZs) in South Sumatra, such as in harbor of Tanjung Api-Api, Muara Enim, PALI, Banyuasin, Ogan Komering Ilir regency, and Lubuklinggau city. Then the development of the MSME-based processing industry supported by human resources to increase productivity and better competitiveness and develop the processing industry for the downstream of superior natural resources by prioritizing the maximum use of local labor and the utilization of natural resources or local raw materials (Bappeda, 2019).

Even in the midst of pressure due to the COVID-19 pandemic, several industrial subcategories were still able to record positive growth in 2020, even though their growth did appear to be contrasting slower than the previous year. Paper and paper goods industry subsector; printing and recording media reproduction became the most dominant subsector contributing to GRDP in 2020 by 4.9 percent. Then the chemical, pharmaceutical, and traditional medicine industry by 3.81 percent; timber, wood, and cork industry subsectors; and woven goods from bamboo, rattan, and the like by 2.23 percent; textile and apparel industry subsector by 1.6 percent and rubber industry subsector; rubber and plastic goods by 1.57 percent (Indonesian Statistic, 2020).

The economic structure was depicted by the distribution of the percentage of GRDP in the manufacturing sector does not necessarily indicate the economic potential of a region to become a base and leading sector, especially South Sumatra (Apriyani, 2021). This potential can be seen from the basis and non-base of a sector (Pribadi & Nurbiyanto, 2021). This base sector is called the leading sector (Amelia & Guswandi, 2022). Research on leading sectors has been conducted by Sundaro (2021) using Location Quotient (LQ) analysis that the results of identifying the processing industry sector in Semarang Regency to be the leading sector. Similarly, research conducted by Akmadani & Tampubolon (2021) using the LQ method also found that the processing industry sector is a leading sector in Indragiri Hilir regency. So that the processing industry sector is the mainstay in the area as well as in South Sumatra.

In fact, the study by Aji & Nasriyah (2020) found that the manufacturing industry sector has a Location Quotient value of less than one ( $<1$ ), meaning that this sector does not include the leading sector, this has been studied in two years. The last ones are 2019 and 2020. However, according to Tauhid & Mutaqien (2021) in a regional fiscal study of South Sumatra Province, the calculation of the leading sector in 2020 even though the LQ is less than one ( $<1$ ) but also uses DLQ analysis that the manufacturing industry sector has a DLQ value of more than one ( $>$ ), means that the prospect of the processing industry is very promising in the regional economy in the future.

Therefore, to increase the manufacturing industry become a leading sector in the regional economy in South Sumatra, it is necessary to identify the leading sub-sector of the processing

industry. Regional development is more optimal if it is focused on leading sub-sectors (Azmiral, 2015). The leading sub-sector is a sub-sector with a comparative advantage that can contribute and accelerate regional development, contribute to GRDP, labor, exports and strong linkages with other sectors (Mahaesa & Huda, 2022; and Lubis et al., 2021). It is certain that the leading sub-sector will grow faster with great potential (Kurniawan et al., 2022).

Identification of leading subsectors is an important concern for the government in regional development planning to determine development policies (Febrianti & Sarfiah, 2022; Yuliana, 2012; Arifin, 2021; Wibisono et al., 2019). The existence of a leading sub-sector can have a wider impact on welfare and provide a multiplier effect on other regions and subsectors (Amelia & Guswandi, 2022). The leading sub-sector must be prepared to become a leading sector to other sub-sectors (Arifah & Sunarjo, 2021). This is reinforced by research conducted by Hamzah (2020) regarding the identification of the leading processing industry subsector in Bangka Belitung using LQ. So that the leading sub-sector is the key to the economy in Bangka Belitung. In contrast to the research of Tounsi et al. (2013) which identified the leading sector using the IDK and IDP methods, the results were obtained that the leading sector was also obtained, namely the food sector. This means that some of these methods can be used to identify leading sectors, so as to get more detailed results this research combines SLQ, DLQ, IDK, and IDP methods to identify leading processing industry sectors in South Sumatra.

To identify the leading processing industry sub-sector, it is necessary to identify the competitive leading processing industry sub-sector in South Sumatra Province. One of the weaknesses of the processing industry is the low competitiveness and the industrial structure still relies on plantation and oil and gas commodities in South Sumatra (Saragih, 2018). So that the processing industry in South Sumatra still cannot be competitive and does not yet have a competitive advantage (Aji & Nasriyah, 2020). The competitiveness of the processing industry is still relatively low due to the low quality of human resources, availability or mastery of technology, infrastructure and others in South Sumatra (Isventina et al., 2015). The use of resources determines the competitiveness of an industry (Zulkarnain et al., 2021). Resource management that is not optimal will also hamper development in South Sumatra Province (Saputri & Boedi, 2018). For this reason, according to Rosnawintang et al. (2015) it is important to have a competitive leading industry, in addition to add the added value, it also helps the regional economy. Also according to Hu (2019) developing a competitive industry is important for regional growth. So that this research will eventually get a superior processing industry subsector that is competitive.

## **2. RESEARCH METHODS**

### *2.1. Data*

The data used the annual time series secondary data from 2016-2020. The related data used are the GRDP of Sumatra Island and the GRDP of South Sumatra Province for the computation of Static Location Quotients (SLQ), Dynamic Location Quotients (DLQ), and Dynamic Shift-Share. Meanwhile, the computation of the Dispersion Power Index (IDP) and Sensitivity Index (IDK) were obtained from input-output table in 2016 from the Indonesian Statistics (BPS). The method used the quantitative descriptive analysis that aims to make a systematic, factual, and accurate description of the phenomenon being investigated sourced from secondary data and several sources such as Indonesian statistics data in 2021, and the results of previous study.

### *2.2. Analysis methods*

This study uses two analytical methods, namely the first to identify the leading processing industry subsectors using the overlay method of computation of SLQ, DLQ, IDP, and IDK. To computation of competitiveness is using Dynamic Shift-Share analysis. Sensitivity Index and Dispersion Power Index is an analysis that is often used in input-output table. According to Rafiqah et al (2018) argue that Sensitivity Index and Dispersion Power Index equalize comparisons by normalizing the relationship between the back and the forward linkage. These two indices can

show key sectors in economic development by looking at the value of the spread power index and the value of the degree of sensitivity index. The sensitivity index shows a sector that can attract output growth in its upstream sector.

$$IDK_i = \frac{\sum_i b_{ij}}{\left(\frac{1}{n}\right) \sum_i \sum_i b_{ij}}, \text{ and} \tag{1}$$

$$IDP_i = \frac{\sum_i b_{ij}}{\left(\frac{1}{n}\right) \sum_i \sum_i b_{ij}} \tag{2}$$

where: IDK is sensitivity index; and IDP is dispersion power index, then use the Leontief inverse matrix elements ( $b_{i,j}$ ) with  $i; j$  indicate input output subsector; and  $n$  is total number of sectors in the economy.

A sector with an IDK and IDP of more than 1 indicates that the sector is a key sector/leading sector as it meets the final demand above the average capability of other sectors. In this study, the determination of the IDK and IDP values was sourced from calculations published by the Indonesian Statistic of South Sumatra Province using the I-O table in 2016. So, the researchers used the data to identify the processing industry in South Sumatra Province.

Additionally, for IDK and IDP, this study also used the Location Quotients (LQ). According to Irmawati (2015) LQ is a method to find out the leading sector of a region by comparing the role of a sector in an area with the role of that sector at a wider level. The LQ analysis produces sectors that have a comparative advantage in the area being analyzed. The LQ technique is divided into two, namely Static Location Quotient and Dynamic Location Quotient. The computation of SLQ and DLQ is as follows:

$$SLQ = \frac{V_{ik}}{V_k} / \frac{V_{ip}}{V_p} \tag{3}$$

$$DLQ = \left(\frac{1+g_{i,j}}{1+G_i}\right) / \left(\frac{1+g_j}{1+G}\right) \tag{4}$$

where:  $V_{ik}$  and  $V_k$  are comparisons between GRDP with total GRDP at 2010 constant prices for manufacturing subsector  $i$  in South Sumatra,  $V_{ip}$  and  $V_p$  are comparisons between GRDP with total GRDP at 2010 constant prices for manufacturing subsector  $i$  on the island of Sumatra. Meanwhile  $g_{ij}$  and  $G_i$  are comparisons between processing subsector  $i$  growth rate in South Sumatra with the growth rate of the processing subsector  $i$  on the island of Sumatra,  $g_j$  and  $G$  are a comparison between the average growth rate of the processing industry in South Sumatra with the average growth rate of all subsectors of the processing industry on the island of Sumatra,  $n$  is a research time period.

**Table 1.** Determination of Leading Processing Industry Subsector Based on Overlay Method

Leading processing industry	Featured determination methods (SLQ, DLQ, IDP, and IDK)
Industry Subsector Processing A	Fulfill the 4 pre-eminent determination methods that have been set to become the leading processing industry
Industry Subsector Processing B	Less than four leading determination methods that have been determined cannot be categorized as leading subsectors

Source: Adiyatin et al. (2019)

If the average of SLQ and DLQ values exceed 1 (SLQ and DLQ >1), then the sector is a basic sector and has potential in the future. If the SLQ and DLQ values are equal to 1 (SLQ and DLQ = 1) then the sector has a specialization level of South Sumatra Province equal to the National level, and if the SLQ and DLQ values are less than 1 (SLQ and DLQ < 1) then the sector is categorized as

non-basic sector and has no potential in the future. To determine the leading processing industry sub-sector based on the combined method of IDP, IDK, and LQ (SLQ and DLQ), an auxiliary table is used which will later determine the selected leading processing industry sub-sector. The overlay method is a technique used to draw a conclusion by combining several analysis results (Adiyatin et al., 2019).

Shift Share analysis is an analytical tool that can be used to find out which sectors of the economy are included in sectors that have competitive advantages or are able to compete with the same sector in other regions and sectors that do not have a competitive advantage (Irmawati, 2015). Unlike the classic shift-share analysis, this study uses dynamic shift-share analysis. Classical analysis assumes that there are three components, namely the national growth component, the proportional growth component and the market share growth component (Ropingi, 2020) According to Herzog and Olsen, the regional share growth component is broken down into a specialization component and a competitive component, these two components are called the allocation effect component (Prasetia et al., 2011). The analysis technique using dynamic shift-share contains a new element, namely homothetic output in sector *i*, province *j*, given the notation  $Y'_{ij}$  and formulated as follows:

$$Y'_{ij} = Y_{ij} (Y_{i,n}/Y_n) \tag{5}$$

where:  $Y'_{ij}$  is homothetic output (GDP achieved by a sub-sector in a region),  $Y_{ij}$  is GRDP of the processing industry sub-sector in South Sumatra Province and  $(Y_{i,n}/Y_n)$  are comparisons between GRDP of processing industry sub-sector *i* with GRDP of the processing industry sector on the island of Sumatra.

Thus, this competitive advantage can be formulated as follows:

$$C'_{ij} = Y'_{ij} (r_{ij} - r_{in}) \tag{6}$$

Where:  $C'_{ij}$  is competitive advantage obtained from the results of  $Y'_{ij}$  calculations with the difference between GRDP growth in the manufacturing sub-sector in South Sumatra and manufacturing sub-sector GRDP growth in Sumatra ( $r_{ij} - r_{in}$ ).

To find out the effect of the allocation that occurs, it can be formulated:

$$A_{ij} = (Y_{ij} - Y'_{ij}) (r_{ij} - r_{in}) \tag{7}$$

where:  $A_{ij}$  is allocation effect and  $Y_{ij} - Y'_{ij}$  are specializations in the processing industry sub-sector in the South Sumatra region.

**Table 2.** Dynamic shift-share analysis method

Code	Definition	Allocation effect	Component	
			Specialization	Competitive advantage
1	No competitive advantage, no specialization	Negative (-)	Positive (+)	Negative (-)
2	No competitive advantage, no specialization	Positive (+)	Negative (-)	Negative (-)
3	There is a competitive advantage, there is no specialization	Negative (-)	Negative (-)	Positive (+)
4	There is a competitive advantage, there is specialization	Positive (+)	Positive (+)	Positive (+)

**Source:** Prasetia et al., (2011)



### 3. RESULTS AND DISCUSSION

#### 3.1. Sensitivity index and spreadability index

The Degree of Sensitivity Index (IDK) which has a value of more than one illustrates that the manufacturing sub-sector has a strong ability to attract output growth in its upstream sector. Based on Table 3, from the results of the data processing of the Input-Output Table in 2016 of South Sumatra, then obtained four subsectors with the IDK value is more than one which illustrates that the subsector has a strong thrust compared to other sectors. The chemical, pharmaceutical and traditional medicine industry sub-sectors are the sub-sectors with the highest IDK value, which is 2.4168, means that if there is an increase the final demand for other sub-sectors is 1 unit, so the chemical, pharmaceutical and traditional medicine subsectors experience an increase in output by 2.4168 units. The other three subsectors that have more than one IDK value are the coal industry and oil refining; food and beverage industry and paper and paper goods industry, printing, and reproduction of recording media with an IDK value of 2.1411 each; 1.9155 and 1.0083.

**Table 3.** Sensitivity index and dispersion power index in the manufacturing sector

Processing industry subsector	IDK	IDP
• Coal and oil refining industry	2.1411	0.8533
• Food and beverage industry	1.9155	1.2561
• Tobacco processing industry	0.6639	0.6886
• Textile and apparel industry	0.6938	1.1229
• Leather, leather goods, and footwear industry	0.6803	1.1416
• Industry of wood; wood and cork; woven from bamboo, rattan, and others	0.6752	1.0349
• Paper and paper goods industry, printing and recording media reproduction	1.0083	1.1981
• Chemical, pharmaceutical, and traditional medicine industry	2.4168	1.1600
• Rubber industry, rubber, and plastic goods	0.9035	1.3060
• Non-metal mineral industry	0.8962	1.2033
• Base metal industry	0.6893	0.9839
• Metal, computer, electronic, optical, and electrical equipment industry	0.9068	0.9719
• Machinery and equipment industry	0.6631	0.8109
• Transport equipment industry	0.6888	1.0145
• Furniture Industry	0.6663	1.0018
• Other services industries, machinery and equipment repair, and installation	0.7080	1.0168

Source: South Sumatra Input-Output Table (2016)

In contrast to the IDK value, the dispersion power index (IDP) value has more sub-sectors that have an IDP value of more than one, which is 11 sub-sectors. According to Wahyuningsih (2015) the value of more than one IDP indicates that the subsector has a strong ability to attract the growth of its upstream sector output. An index value greater than one indicates that the degree of sensitivity in the industrial subsector is above the average degree of sensitivity of all processing industry subsectors in South Sumatra.

The sub-sector with the highest IDP value is the rubber and plastic goods industry at 1.3060, means that an increase of 1 unit of output in the food and beverage industry sub-sector will cause an overall increase in the output of other sub-sectors by 1.3060 units. The other ten sub-sectors of the processing industry that have an IDP value of more than one are the food and beverage industry; non-metal mineral industry; paper and paper goods industry, printing and recording media reproduction; chemical, pharmaceutical and traditional medicine industry; leather, leather goods and footwear industry; textile and apparel industry; industry of wood, goods made of wood and cork and woven goods of bamboo, rattan and the like; other processing industries, machinery and equipment repair, and installation services; transportation equipment industry; and the furniture industry.

### 3.2. Static location quotients and dynamic location quotients

Table 4 reports the calculation results of the SLQ and DLQ in 2016-2020 using data on the GRDP of South Sumatra and the GRDP of the Island of Sumatra. Based on the calculation results, it is known that of the 16 sub-sectors of the processing industry in South Sumatra Province, there are 6 sectors that fall into the potential basis category and the remaining 10 sectors fall into the non-base but potential category.

**Table 4.** Calculation of SLQ and DLQ Values in 2016-2020 South Sumatra Province

Processing industry subsector	SLQ	DLQ
• Coal and oil refining industry	3.721	1.001
• Food and beverage industry	1.134	1.004
• Tobacco processing industry	0.006	1.468
• Textile and apparel industry	0.140	1.043
• Leather, leather goods, and footwear industry	0.022	1.013
• Industry of wood; wood and cork; woven from bamboo, rattan, and others	1.581	7.589
• Paper and paper goods industry, printing and recording media reproduction	1.245	1.146
• Chemical, pharmaceutical, and traditional medicine industry	2.335	22.624
• Rubber industry, rubber, and plastic goods	2.633	1.012
• Non-metal mineral industry	0.888	1.044
• Base metal industry	0.018	1.027
• Metal, computer, electronic, optical, and electrical equipment industry	0.135	1.015
• Machinery and equipment industry	0.023	1.071
• Transport equipment industry	0.110	1.025
• Furniture Industry	0.315	1.008
• Other services industries, machinery and equipment repair, and installation	0.440	1.015

Source: Indonesian Statistic, 2020 (Data processed)

The six sub-sectors categorized as basic and potential are the coal industry and oil refining; food and beverage industry; industry of wood, goods made of wood and cork and woven goods of bamboo, rattan, and others; paper and paper goods industry, printing and recording media reproduction; chemical, pharmaceutical, and traditional medicine industry; and the rubber, and plastic products industry. Based on the theory of base and non-base according to Nur et al. (2013) that the subsector with the base and potential categories is a subsector that exports goods and services or labor outside the economic boundaries of the region concerned. It can be proven that the exports of South Sumatra Province according to Indonesian Statistic (2020) throughout 2020 were dominated by the processing industry sector including the six subsectors above with total exports reaching 77.18 percent. This shows that these six sectors are the mainstay of South Sumatra Province and are able to compete in the global market. This is in line with study by Hamzah (2020) found that the subsector of the processing industry studied in the Bangka Belitung Islands Province that the food and beverage industry; rubber industry, goods from rubber and plastics is a base subsector as is the case in South Sumatra.

Meanwhile, the non-base subsector means that this subsector does not export goods, services or labor so that the scope of production and market areas are only local. The Manufacturing Industry Sub-sector which has an SLQ value below one or categorized as non-basic, indicates that the sub-sector has not been able to meet the needs of the South Sumatra Province so that it tends to import from other regions/countries. However, all sub-sectors of the processing industry have a DLQ value of more than one, means it is very potential, so the local government in its development planning must make a special strategy in improving the sub-sector which is currently not categorized as a basis so that in the future it can become a basis and can provide benefits for the South Sumatra.



### 3.3. Determination of the leading processing industry subsector using Overlay methods

The results of determining the leading processing industry using the combined method, the results obtained are in the form of the leading processing industry sub-sector in the province of South Sumatra, where the selected leading processing industry has met the four methods or indicators, namely, IDK, IDP, SLQ and DLQ. The summary results of the combined determination of the processing industry sub-sectors, the leading processing industry can be seen in Table 5.

**Table 5.** Determination of processing industry subsector featured by Overlay methods

Leading processing industry subsector	Criteria for determining leading processing industry subsector
<ul style="list-style-type: none"> <li>• Food and beverage industry</li> </ul>	<ul style="list-style-type: none"> <li>• Meets four leading determination methods: IDK, IDP, SLQ and DLQ</li> </ul>
<ul style="list-style-type: none"> <li>• Paper and paper goods industry, printing and recording media reproduction</li> </ul>	<ul style="list-style-type: none"> <li>• Meets four leading determination methods: IDK, IDP, SLQ and DLQ</li> </ul>
<ul style="list-style-type: none"> <li>• Chemical, pharmaceutical, and traditional medicine industry</li> </ul>	<ul style="list-style-type: none"> <li>• Meets four leading determination methods: IDK, IDP, SLQ and DLQ</li> </ul>

Source: Adiyatin et al. (2019)

The determination of the leading processing industry sub-sector by combining the four methods, three sub-sectors of the leading processing industry in South Sumatra Province are obtained, namely:

- Food and Beverage Industry,
- Paper and Paper Goods Industry, Printing and Reproduction of Recording Media,
- Chemical, Pharmaceutical and Traditional Medicine Industry.

### 3.4. Effect of allocation of leading processing industry subsector in South Sumatra

The three leading processing industry sub-sectors that have been calculated based on several methods of determining the leading processing industry, 3 sub-sectors are obtained, 2 sub-sectors of leading processing industry are included in category 4 (having specialization and competitive advantage), namely the Food and Beverage Industry; and Industry of Paper and Paper Goods, Printing and Reproduction of Recording Media (Table 6).

**Table 6.** Effect of allocation of leading processing industry subsector of South Sumatra

Leading processing industry subsector	Allocation effect	Specialization	Competitive advantage
<ul style="list-style-type: none"> <li>• Food and beverage industry</li> </ul>	1,971.11	10,515.20	0.1875
<ul style="list-style-type: none"> <li>• Paper and paper goods industry, printing and recording media reproduction</li> </ul>	187.13	3,782.02	0.0495
<ul style="list-style-type: none"> <li>• Chemical, pharmaceutical, and traditional medicine industry</li> </ul>	-7.55	-260.84	0.0289

Source: Indonesian Statistic, 2020 (data processed)

Table 6 reports that the three leading processing industry sub-sectors have positive competitive advantage values in 2016-2020. This is because these three sub-sectors have a higher growth value than the growth of the three sub-sectors on the island of Sumatra. This means that the three sub-sectors of the superior processing industry are able to continue to be improved because they are ready to be competitive with products outside the province of South Sumatra. The competitiveness of this subsector is inseparable from several factors, in accordance with what was study by Sukanto (2009) that regional financial indicators, economic performance (consistency of the processing industry subsector to GRDP) and the human development index in the regencies/cities of South Sumatra.

Table 6 also show that the food and beverage industry subsector; and the paper and paper goods industry, printing and recording media reproduction has a competitive advantage (+) and

specialization (+) so that it has a positive allocation effect (+), meaning that these two sub-sectors have a locational advantage. For the food and beverage industry, based on Indonesian Statistic (2021), indeed in the first quarter of 2020 it was also affected by the impact of the covid-19 pandemic and its development was decreasing, this is also related to the implementation of large-scale social restrictions (PSBB), consumers tend to reduce consumption outside the home so that the demand for food products decreases. Additionally, the producers of the food and beverage processing industry will reduce their production. However, in the fourth quarter, the production of the food and beverage industry has started to rise and has increased from what was previously in the third quarter of -4.66 to 73.37 percent in the fourth quarter of 2020.

When viewed from the contribution of the food and beverage industry sub-sector to the GRDP of South Sumatra, it is very dominating compared to the other fifteen subsectors. This food and beverage processing industry sub-sector can reach 50.16 percent or 45 trillion rupiah of the total contribution of the manufacturing industry sector as a whole in 2020 (Indonesian Statistic, 2020). In addition to contributing greatly to GRDP, the food and beverage industry subsector can create jobs, this is in line with the study by Atiyatna et al. (2020) found that the increase in production value has a significant and positive effect on the absorption of labor in the food and beverage industry subsector in South Sumatra Province. Additionally, according to Azwardi et al. (2019) food security of food and beverage industry products must also be considered to improve the quality of the products produced. It is also strengthened by the research of Hardiawan et al., (2019) that the food and beverage industry subsector is a leading sector in Jambi Province that can stimulate the number of poor people with a policy of downstreaming food and beverage products. Downstream policies need to be carried out because developing countries including Indonesia (South Sumatra) still depend on the agricultural sector as the main source of food for direct and raw consumption, so education is needed regarding downstream programs that can produce quality food and beverage products (Dunga & Dunga, 2017).

Likewise with the Paper industry and paper goods industry, printing, and recording media reproduction which indeed the raw materials for this industry come from the local South Sumatra Province itself. The extent of plantations in South Sumatra can meet the needs of the paper and paper goods industry, printing, and reproduction of recording media. The existence of collaboration that produces downstream products of the paper and goods subsector from paper, printing, and reproduction of recording media with the plantation subsector can produce a quality processing industry. This is in line with study by Dearlinasinaga (2015) that with the plantation subsector which has a fairly good strength base, of course, it is very influential on economic growth, especially in the field of downstream paper industry.

In contrast to the chemical, pharmaceutical and traditional medicine industries, which only have a competitive advantage (+) but are not specialized (-), this means that this industry is indeed competitive to support the development of the manufacturing sector in South Sumatra, but the specialization and location effects have not been realized. This is also illustrated by Indonesian Statistic (2020) that its development experienced a very significant decline in 2020 until the fourth quarter of -13.12 percent. The lack of a number of professional workers from this industry has resulted in the government having to make products from chemicals sourced from imports so that the production of this industry in South Sumatra Province has decreased. It is also conveyed by Bathelt (2013) that the development of the chemical industry depended on the roles of individual industrial leaders in the region, who acted as network builders, mobilized joint action and stimulated the development of a collective regional spirit.

Therefore, these three subsectors should be able to continue to drive the economy in the manufacturing sector so that a special strategy is needed that must be carried out by the government. According to Saragih (2018) there are many choices of industrialization strategies that can be used, one of which is an export-oriented industry based on the fact that products made by domestic industries are sold in the export market. This strategy can certainly be applied in the three leading processing industry subsectors of South Sumatra Province because it has strong potential and competitiveness.

#### 4. CONCLUSIONS

The results of the analysis of the calculation method for determining the leading processing industry sub-sectors, namely the IDK, IDP, SLQ and DLQ values, it was found that the sub-sectors that met the four criteria were the food and beverage industry; paper and paper goods industry, printing and recording media reproduction; and chemical, pharmaceutical, and traditional medicine industries. These are indeed the three sub-sectors of the manufacturing industry in South Sumatra Province, apart from being the largest contributor to the manufacturing sector, these three sub-sectors are a priority as a driver of the regional economy.

After obtaining the leading processing industry sub-sectors, using the dynamic shift-share analysis method from the three leading processing industry sub-sectors, only the Food and Beverage Industry; and the paper and paper goods industry, printing, and reproduction of recording media which have specialization and competitive advantages, while the chemical, pharmaceutical, and traditional medicine industries do not have specialization but have competitive advantages.

This means that in this case, the local government must specialize in fully supporting all sub-sectors of the processing industry. This in addition to increase regional income, also helps create jobs for the people of South Sumatra Province. As well as in regional budgeting, the priority of the development of the processing industry in South Sumatra must be prioritized because the manufacturing industry is the leading sector for other sectors. The limitations of this study are the lack of detailed data on the processing industry sub-sector and the locations of the processing industry in South Sumatra Province. Additionally, there is still no specific policy that focuses on the development of the processing industry subsectors. It is hoped that from this research, further research can develop to create a strategy in improving the processing industry in South Sumatra because there are still many identification factors that cause the processing industry in South Sumatra to be slow in its development.

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