Jurnal Penelitian Ekonomi dan Bisnis

Economic Development of Jayapura Regency, Papua Province Based on the Potential of Leading Regional Economic Sectors

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Article Information

Abstract

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This study aims to identify and analyze the economic sectors that are the leading sectors and potential sectors of the region that can be developed to improve the regional economy of Jayapura Regency, using time series data from 2013-2021 which were analyzed using Economic Sector Contribution Analysis, Growth Ratio Model Analysis, Location Quotient Analysis, Shift-Share Analysis, Klassen Typology Analysis of GRDP Sector Approach, Klassen Typology Analysis of Leading Sector Approach, and Overlay Model Analysis of Jayapura Regency. The results of the study show that Jayapura Regency has 14 leading economic sectors that play an important role in driving economic activities and economic development of Jayapura Regency, one of which is the primary sector, namely the Agriculture, Forestry, and Fisheries sector. For this reason, in the future, mapping of the sub-sectors that are the leading primary sectors can be carried out so that the development of superior regional products can be carried out, one of which is through the establishment of the Jayapura Regency Regional-Owned Enterprise engaged in the fields of Agriculture, Forestry, and Fisheries.

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INTRODUCTION

The economic development of a region can be seen through important indicators as a measure, namely the economic growth of the region. The economic growth of a country or region is influenced by capital accumulation, population growth and technological progress. A region can create investment opportunities in its region by exploring and utilizing the potential of the leading sectors owned by the region (Aswandi & Kuncoro, 2002). Hoover (1971) and Soepono (2000) stated that the growth of the leading sector which is the base economic sector determines the development of a region as a whole, while other sectors that are not base economics are the consequences of overall development in the region (Aswandi & Kuncoro, 2002). Regional economic development through the development and empowerment of the potential of leading sectors as the base economic sector in the region must be carried out in order to advance the regional economy and improve the welfare of the community.

Regional economic development aims to improve people's welfare. Currently, the central government and local governments are actively making various development efforts in Papua Province to improve the welfare of the Papuan people. One of the strategies for implementing the Acceleration of Welfare Development in Papua Province is carried out through the development of the local economy of districts and cities as stated in Presidential Instruction Number 9 of 2017 (Presiden RI, 2017) and Presidential Instruction Number 9 of 2020 (Presiden RI, 2020). This approach shows that the government prioritizes the development of natural resource potential in accordance with local wisdom and socio-cultural characteristics in each region, in the economic development of districts and cities in Papua Province. For this reason, it is necessary to map the leading and potential sectors as the basis of the regional economy in each district and city. There are 28 regencies and 1 city in Papua Province until 2022 which are spread over 5 customary areas (Mamta, Saireri, Meepago, Lapago, Anim Ha) as development areas. Jayapura Regency is the first parent regency which has now been divided into 4 regencies and 1 city, namely Jayapura Regency, Keerom Regency, Sarmi Regency, Mamberamo Raya Regency and Jayapura City. The five districts / cities are in the same customary area, namely the Mamta customary area in Papua Province, and Jayapura Regency is one of the districts in the Mamta customary area which during 2013-2021 its regional income (GRDP) made the second largest contribution to the regional income of Papua Province after Jayapura City as the provincial capital, with an average contribution of 9.77 percent per year. This indicates an increase in the role of Jayapura Regency's economic sectors in its regional economy. The role of economic sectors in the regional income of Jayapura Regency during the 2013-2021 period was dominated by the Agriculture, Fisheries and Forestry sector, followed by the Transportation and Warehousing sector, the Construction sector, and the Wholesale and Retail Trade; Car and Motorcycle Repair sector, which always contributed more than 10 percent each year with an average contribution of the Agriculture, Fisheries and Forestry sector of 22.43 percent per year, and followed by the other three sectors at 14.18 percent, 13.50 percent and 12.98 percent respectively. Meanwhile, other economic sectors are only able to contribute less than 10 percent per year (Badan Pusat Statistik Provinsi Papua, 2017; Badan Pusat Statistik Provinsi Papua, 2022; Badan Pusat Statistik Provinsi Papua, 2023).

In regional economic development, development cannot be carried out simultaneously in all sectors of the economy but is prioritized on the development of superior economic sectors and has considerable growth potential, because these sectors are expected to grow and develop rapidly and will stimulate other related economic sectors to develop to keep pace with the development of potential sectors and superior sectors. The rapid growth of the leading and potential sectors will encourage the polarization of other economic units which in turn will indirectly have an impact on the improvement of other economic sectors. Referring to this, the regional economic development

of Jayapura Regency can be carried out by developing various productive businesses originating from leading and potential economic sectors as a driving force as well as a stimulus for other economic sectors to improve the economy of Jayapura Regency.

This study aims to determine and analyze the economic sectors that are the leading sectors and potential regional sectors that can be developed to improve the regional economy of Jayapura Regency. Over the past seven years, namely during 2018-2024, various studies related to the development of economic potential and leading sectors in each region in order to improve the regional economy in various regions in Indonesia have been carried out by several researchers such as Nurriyanti & Setyowati (2024) who analyzed the impact of economic structure on economic growth in economic development planning in the Barlingmascakeb region (Banjarnegara, Purbalingga, Banyumas, Cilacap, and Kebumen Regencies) and determined the leading sectors in each district/city, using Location Quotient analysis, Classic Shift Share, and Leading Sector Identification. Both found that there are nine leading sectors in the Barlingmascakeb region that can boost the economy of each district/city including the agricultural sector, mining and quarrying industry sector, water supply sector, wholesale trade sector, transportation sector, government administration sector, education services sector, health services sector, and other services. Harsono et al. (2023) which describes the trade structure and leading sectors of the regional economy encourage economic growth in the NTB region. Using inter-regional input and output data, it was found that the agricultural sector is still the economic sector with the largest output value in NTB. However, based on the linkages between economic sectors, the Electricity and Gas Procurement sector has the greatest capacity to encourage the progress of its upstream and downstream sectors, so this sector has the potential to become a leading sector with the highest economic multiplier if it continues to be encouraged to encourage NTB's economic growth.

Shinta (2022) analyzed the leading sectors in four regencies and one city in Yogyakarta Special Region Province during the 2018-2021 period using Location Quotient analysis, Shift-Share analysis, and Klassesn Typology analysis methods, and found that Sleman Regency has seven leading sectors, Bantul Regency has six leading sectors, Yogyakarta City has eleven leading sectors, Kulonproga Regency has eight leading sectors, and Gunung Kidul Regency has seven leading sectors. Nalle et al. (2022) identified and analyzed changes and shifts in economic sectors, classified and mapped leading sectors and formulated appropriate strategies in order to realize inclusive economic development in North Central East Regency, using Shift Share analysis, Klassen Typology analysis and SWOT analysis. He found that the agricultural sector is the sector that has the largest share and is also among the sectors that are developing and growing rapidly along with the manufacturing sector. Inclusive economic development through the concept of leading sector development can be carried out by local governments by utilizing all forms of existing strengths by considering various opportunities owned by the North Central East District. Setiawan et al. (2022) analyzed the leading and potential economic sectors in the Special Region of Yogyakarta Province to encourage more targeted development using data from 2016-2021 which was analyzed using the Location Quotient Analysis method, Growth Ratio Model Analysis, Klassen Typology Analysis and Overlay Analysis. They found that the Information and Communication sector, and the Education Services sector are the leading sectors in DIY Province. While the potential sectors that can be developed in DIY Province consist of the Water Procurement, Waste Management, Waste and Recycling sector; Construction sector; Transportation and Warehousing sector; Accommodation and Drinking Food Provision sector; Real Estate sector; Government Administration, Defense and Compulsory Social Security sector; Health Services and Social Activities sector; and other Services sector. Mesoino et al. (2022) analyzed the regional leading sectors and competitive sector growth and analyzed the economic development strategy of Penajam Paser Utara Regency with data from

2011-2020 and used Location Quotient analysis, Shift-Share analysis, and SWOT analysis. They found that the economic sectors that are the competitive regional leading sectors are the Agriculture, Fisheries and Forestry Sector; Mining and Quarrying Sector; and Processing Industry Sector. In addition, local governments can take advantage of their strengths and opportunities by optimizing the performance of competitive leading economic sectors to drive and improve the regional economy of Penajam Paser Utara Regency. Rizani (2020) identified and determined the leading sectors in Malang City to describe the leading economic activities that can be developed to increase economic potential in Malang City using Shift-Share analysis, Location Quotient, and Growth Ratio Model. The findings show that there is an increase in the economic performance of Malang City, where there are five leading and highest potential economic sectors, namely the health services and social activities sector, education services, construction, wholesale and retail trade, repair of cars and motorcycles, and financial and insurance services. Sarwo et al. (2019) analyzed the potential of the leading economic sectors of the Semarang City region which aims to develop the Semarang City region. By using Location Quotion analysis, Klassen Typology analysis and Shift-Share analysis, they found that the direction of regional development policies in Semarang City should be focused on eleven regional leading economic sectors so that the regional economy can develop according to its superior economic potential.

Kharisma & Hadiyanto (2019) analyzed the potential of leading sectors and formulated regional development policy priorities in Maluku Province using Location Quotient, Growth-Ratio Model, Overlay, SWOT and Analytic Network Process methods. Both found that there are eight economic categories that have basic sectors in Maluku Province. The economic sector with the highest average growth ratio is the mining and quarrying sector. While the sector that provides the highest contribution and growth is the government administration, defense, mandatory social security sector. The policy priority in regional development is the acceleration of infrastructure development to encourage the acceleration of the improvement of the regional economy of Maluku Province. Srivani et al. (2018) analyzed and found out the potential economic sectors, the level of interaction, the level of equitable development, the strategic location of development and regional development, and found out the leading commodities in each sub-district as a basis for determining regional development strategies based on the economic potential of Lima Puluh Kota Regency using Location Quotient analysis, Shift-Share analysis, Growth Ratio Model analysis, Overlay analysis, Klassen Typology analysis, Gravity Model, Centrality Index, and Stopping Point Theory. The results show that the Mining and Quarrying sector, as well as the Health Services and Social Activities sector are leading sectors because they show very large growth and contribution to the GRDP of Lima Puluh Kota Regency so that they need to be encouraged to accelerate the improvement of the regional economy. The various studies conducted resulted in the direction of regional development policies focused on regional leading sectors in order to develop the economy of each region in accordance with its superior economic potential. Although the various analytical methods used in this study are almost the same as those used in the previous studies described above, it should be noted that this study uses overlay analysis by combining or interacting two kinds of Klassen typology, namely sectoral Klassen typology (comparison of GRDP growth and contribution) and leading sector Klassen typology (comparison of location quotients and shift-share analysis) so as to obtain an overlay model of Jayapura Regency, which produces leading sectors that are advanced and fast-growing sectors, in order to encourage and accelerate the economic improvement of Jayapura Regency.

METHOD

This research was conducted in Jayapura Regency, Papua Province using data for the period 2013-2021 in the form of GRDP per capita data, population, economic growth rate, and GRDP economic sectors in Jayapura Regency and also Papua Province data obtained from the Central Bureau of Statistics (BPS) of Papua Province and Jayapura Regency, Regional Planning and Development Agency (BAPPEDA) of Jayapura Regency and Papua Province, Bank Indonesia, and others. Data collection was conducted using documentation and literature study methods. The following is a description of some of the analytical methods used in this research.

Economic Sector Contribution Analysis

The data analysis method used to determine the contribution of each economic sector in Jayapura Regency is a descriptive method with a contribution approach. Contribution analysis is an analytical tool used to determine how much contribution can be contributed by economic sectors to the formation of GRDP in Jayapura Regency. The formula used to calculate the contribution of economic sectors to GRDP is as follows (Hartoko & Angeline, 2021):

$$Pn = \frac{QXn}{QYn} \times 100\%$$

Where: Pn = Contribution of economic sectors to GRDP (percent); QXn = Value of GRDP sectors (rupiah); QYn = Total GRDP value (rupiah); and n = years

Growth Ratio Model (GRM) Analysis

The Growth Ratio Model is generated by comparing the growth of an economic sector in a region/area (e.g. district/city) with the growth of the economic sector in a wider region/area (e.g. province) (Yusuf, 1999; Setiawan et al., 2022). The MRP analysis consists of the growth ratio of the economic sector in the research area (RPs), namely Jayapura Regency, and the growth ratio of the same economic sector in the broader reference area (RPr), namely Papua Province.

The Growth Ratio Model (GRM) analysis resulted in four criteria that are interpreted as follows:

Table 1. Growth Ratio Model (GRM)

CRITERIA	RPr > 1 (+)	RPr < 1 (-)
RPs > 1 (+)	Fast Growing Sectors (Dominant Growth)	Slow Growing Sectors
RPs < 1 (-)	Potential Sectors	Relatively Underdeveloped Sectors (Low Growth)

Source : Yusuf (1999) and Setiawan et al. (2022)

Location Quotient (LQ) Analysis

LQ analysis is used to map the leading economic sectors or basic and non-basic economic sectors in an economic region and can identify the basic sector or comparative advantage of a region (Hasanah, 2021; Ratnasari et al., 2022). Location Quotient (LQ) is an index to compare the share of a sub-region/area in a particular activity (economic sector) with the total share of that activity (economic sector) in the total activity (all economic sectors) of the region/area. More operationally, LQ is defined as the ratio of the percentage of total activity in the i-th sub-region/area to the percentage of total activity in the observed region.

Location Quotient (LQ) to determine the leading sector (economic sector basis) of Jayapura Regency is calculated with the following equation:

$$LQ = \frac{Xr/RVr}{Xn/RVn}$$

Where: LQ = Location Quotient Index / Regional specialist index; Xr = GDP of sector i in Jayapura Regency; RVr = Total GDP of Jayapura Regency; Xn = GDP of sector i in Papua Province; RVn = Total GDP of Papua Province.

The results of the LQ calculation produce three criteria, namely:

1) LQ<1: included in the non-base category, the production / output of the region cannot meet its own needs so it needs supplies from other regions or imports.
2) LQ=1: included in the non-base category, and has no comparative advantage, the production/output is only enough to meet the needs of the region itself and is not able to be exported to other regions.
3) LQ>1: belongs to the basis category (superior) or becomes a source of growth, comparative production, the results/outputs are able to meet the needs in their own region and can also be exported outside the region or to other regions.

Shift-Share Analysis (SSA)

Shift-Share Analysis (SSA) is an analytical technique used to see the level of competitiveness of a region or commodity in a wider aggregate area, based on the performance of the local sector in the region. The area in question can be a province within the scope of the national aggregate area, or a district/city within the scope of the provincial aggregate area, or a sub-district within the scope of the district/city area, and so on. This research uses the Esteban-Marquilas (E-M) Shift-Share Analysis approach.

The Esteban-Marquilas (E-M) Shift-Share Analysis contains a new element, namely homothetic output in sector i in district j, notated Y'ij. Where, Y'ij is the GRDP achieved by sector i in the district if the GRDP structure in the district is the same as the structure in the province, C'ij measures the competitive advantage or disadvantage of sector i in the district economy, and Aij is the allocation effect or part of the classical competitive effect (advantage) that indicates the level of specialization in sector i in the district (Oktavilia, 2011). Esteban-Marquilas (E-M) Shift-Share assessment criteria are as follows:

Table 2. Assessment criteria of Esteban-Marquilas (E-M) Shift-Share Analysis

Code	Criteria	Aij (Allocation Effect)	Component	
			(Yij – Y'ij)	(ri – Ri)
01	Competitive Disdvantage, Spesialized	Negative	Positive	Negative
02	Competitive Disadvantage, Not Spesialized	Positive	Negative	Negative
03	Competitive Advantage, Not Spesialized	Negative	Negative	Positive
04	Competitive Advantage, Spesialized	Positive	Positive	Positive

Klassen Typology Analysis of GRDP Sector Approach

Klassen's typology is used to determine an overview of the mapping of developed economic sectors and relatively underdeveloped economic sectors in the regional economy of Jayapura Regency. Through this analysis, four different characteristics of economic patterns and structures and economic contributions are obtained (Aswandi & Kuncoro, 2002; Adhitama, 2012; Hasanah, 2021), namely: fast-advancing and fast-growing sectors (high growth and high income/contribution) in Quadrant I, developed but depressed sectors (high income/contribution but low growth) in Quadrant II, fast-growing sectors (high growth but low income/ contribution) in Quadrant III, and relatively underdeveloped sectors (low growth and low income/contribution) in Quadrant IV.

The Klassen typology of the GRDP Sector approach is carried out by comparing the growth rate of each economic sector of GRDP and its contribution in Jayapura Regency with Papua Province.

Table 3. Klassen Typology of GRDP Sector Approach

CRITERIA		Sector Contribution to GRDP	
		$yi > y$	$yi < y$
Sector Growth Rate	$ri > r$	Quadrant I (Advanced and Fast Growing Sectors)	Quadrant III (Fast Growing Sectors)
	$ri < r$	Quadrant II (Advanced but Depressed Sectors)	Quadrant IV (Relatively Underdeveloped Sectors)

Source: Aswandi & Kuncoro, 2002; Adhitama, 2012; Hasanah, 2021.

Description:
yi = Contribution of sector i to total GRDP in Jayapura Regency
y = Contribution of sector i to total GRDP in Papua Province
ri = Growth rate of GRDP of sector i in Jayapura Regency
r = Growth rate of GDP of sector i in Papua Province

Klassen Typology Analysis of Leading Sector Approach

Klassen's typology is used to determine an overview of the mapping of leading economic sectors, potential economic sectors and relatively lagging economic sectors in the regional economy of Jayapura Regency. The Klassen Typology Sectoral Approach is a combination of the results of the LQ analysis and the results of the Shift-Share analysis.

Table 4. Klassen Typology Leading Sector Approach

CRITERIA	Shift Share (+)	Shift Share (-)
LQ > 1	Leading Sector	Potential Sector
LQ < 1	Potential Sector	Relatively Underdeveloped Sector

Source: Yusuf, 1999; Oktavilia, 2011; Negara & Putri, 2020.

Through the Klassen Typology of Sectoral approach, three classifications of economic sectors can be obtained, each of which has different characteristics, namely the Leading Sector, Potential Sector and Relatively Underdeveloped Sector (Yusuf, 1999). So by using the Klassen Typology Sectoral Approach, it will be known which economic sectors are the leading and potential economic sectors to be developed in Jayapura Regency, Papua Province.

Jayapura Regency Overlay Model Analysis

The Jayapura Regency Overlay Model Analysis is an analytical instrument utilized in determining potential and leading economic sectors by combining the results of the GDP Sector Approach Klassen Typology analysis and the Featured Sector Approach Klassen Typology analysis. The Overlay Model analysis produces economic sectors that can be classified as leading sectors, potential sectors that can be developed or lagging sectors that are not included in either category.

The combined results of the Klassen Typology analysis of the GDP Sector Approach and the Klassen Typology analysis of the Leading Sector Approach are as follows:

Table 5. Jayapura Regency Leading Sector Overlay Model

Criteria for Developing Leading Sectors in Jayapura Regency	Klassen Typology of PDRB Sector Approach (Growth & Contribution)			
	Advanced and Fast Growing Sectors	**Sektor Maju tapi Tertekan**	**Advanced and Fast Growing Sectors**	**Sektor Relatif Tertinggal**
Klassen Typology of Leading Sector Approach (LQ & Shift-Share) — Leading Sectors	Leading Sectors of Jayapura Regency	Advanced but Depressed Sectors that can become Leading	Sectors that are Rapidly Developing to Become Leading	Underdeveloped Sectors that have the Potential to Become Leading
Potential Sectors	Potential Sectors that are Rapidly Growing and Developing	Potential Sectors that can Advance but are Depressed	Potential Sectors that are Rapidly Growing	Potential Underdeveloped Sectors
Relatively Underdeveloped Sectors	Underdeveloped Sectors that are Rapidly Growing	Underdeveloped Sectors that can Advance but are Depressed	Underdeveloped Sectors that are Rapidly Growing	Severely Underdeveloped Sectors

Source: Yusuf, 1999; Aswandi & Kuncoro, 2002; Oktavilia, 2011; Hasanah, 2021;
Combined by Researcher, 2024.

RESULT AND DISCUSSION

Economic Sector Contribution Analysis

The Gross Regional Domestic Product (GRDP) of a region can illustrate the role of economic sectors or economic business fields in the regional economy. The magnitude of the role of various economic sectors in producing goods and services determines the economic structure of a region. The economic structure of Jayapura Regency is formed from the added value created by each economic sector, which shows the dependence of Jayapura Regency on the production capacity of each economic sector.

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The contribution of each economic sector or economic business field provides information about the composition of each sector that contributes to the Jayapura Regency economy as a whole. The contribution of an economic sector can increase normally, but decrease in percentage or vice versa. Therefore, the percentage contribution or role of each economic sector is important.

Over the past ten years, namely in the 2012-2021 period, there are four sectors that have always dominated the contribution to GRDP based on economic business fields in Jayapura Regency, namely the Agriculture, Forestry and Fisheries sector; the Transportation and Warehousing sector; the Construction sector; and the Wholesale and Retail Trade; Car and Motorcycle Repair sector. In other words, these four sectors dominate the economic structure of Jayapura Regency, especially the GRDP based on economic business fields.

The contribution of economic sectors in Jayapura Regency is still dominated by the Primary Sector, which is mainly supported by the Agriculture, Forestry and Fisheries sectors. The contribution of the Agriculture, Forestry and Fisheries sector ranks first with an average contribution of 22.51 percent over the last ten years. This shows that Jayapura Regency still relies on its economy on natural resources such as land and everything contained in it including unprocessed crops. The contribution of Jayapura Regency's Agriculture, Forestry and Fisheries sector is even higher than the same sector in Papua Province with an average contribution of 11.41 percent. The second sector that contributes significantly to the regional income of Jayapura Regency is the Transportation and Warehousing sector with an average contribution of 14.17 percent, exceeding its contribution to the regional income of Papua Province which averaged only 4.10 percent over the last ten years.

The role of each economic sector or economic business field in the formation of the GRDP of Jayapura Regency over the past ten years (2012-2021) can be seen in Table 6 below:

Table 6. Results of Contribution Analysis of Economic Sectors of GRDP Average Year 2012-2021 (in Percent)

No	Economic Sector of GRDP	Average Contribution	
		Jayapura	Papua
1	Agriculture, Forestry, and Fisheries	22.51	11.41
2	Mining and Quarrying	2.30	39.74
3	Processing Industry	5.03	2.00
4	Electricity and Gas Procurement	0.04	0.03
5	Water Supply, Waste Management, Waste & Recycling	0.18	0.06
6	Construction	13.14	11.32
7	Wholesale & Retail Trade; Repair of Cars & Motorcycles	13.06	8.35
8	Transportation and Warehousing	14.17	4.10
9	Provision of Accommodation and Drinking Food	1.29	0.67
10	Information and Communication	5.81	3.78
11	Financial Services and Insurance	1.39	1.48

12	Real Estate	4.67	2.49
13	Company Services	2.09	1.17
14	Government Administration, Defense & Compulsory Social Security	8.39	8.63
15	Education Services	2.18	2.12
16	Health and Social Services	1.60	1.57
17	Other Services	1.70	1.08

Source: Research data processed, 2024.

Growth Ratio Model Analysis (MRP)

Economic growth in Jayapura Regency can be seen as an increase in the amount of goods and services produced from economic activities by all business fields in Jayapura Regency during the year. Economic growth is one of the macro indicators to see the real economic performance in Jayapura Regency. The rate of economic growth is calculated based on changes in GRDP at constant prices of the year concerned against the previous year. In addition to looking at the overall economic growth of Jayapura Regency, it is also important to look at the growth of each business sector of the economy as a shaper of overall growth.

The growth rates of the economic sectors of the Jayapura Regency GRDP as shown in Table 7 indicate that over the last ten years, there have been three economic sectors in Jayapura Regency that have achieved double-digit growth. These three economic sectors include the Construction sector with growth of 12.98 percent; the Information and Communication sector, and the Corporate Services sector with the same growth rate of 11.72 percent each. These three sectors showed growth that exceeded the growth of the same sector in Papua Province. The Construction sector in Papua Province only grew by 6.98 percent. Meanwhile, the Information and Communication sector, and the Corporate Services sector only experienced growth of 5.85 and 4.30 percent, respectively. Meanwhile, there are also economic sectors in Jayapura Regency with low growth, namely the Mining and Quarrying sector, which only experienced growth of 1.70 percent. This is inversely proportional to the growth of the sector in Papua Province which grew by 6.05 percent. The high growth rate of the Mining and Quarrying sector in Papua Province is due to the large contribution from other districts / cities that have advantages in the Mining and Quarrying sector. For other economic sectors in Jayapura Regency and in Papua Province, although the growth has not reached 2 digits, the growth rate is positive and exceeds 1 percent.

Table 7. Growth Rate of Economic Sectors of GRDP Average Year 2012-2021 (in Percent)

No	Economic Sector of GRDP	Jayapura (RPs > 1)	Papua (RPr > 1)
1	Agriculture, Forestry, and Fisheries	4.55	2.99
2	Mining and Quarrying	1.70	6.05
3	Processing Industry	4.16	2.75
4	Electricity and Gas Procurement	5.96	5.67
5	Water Supply, Waste Management, Waste & Recycling	4.46	3.32
6	Construction	12.98	6.98
7	Wholesale & Retail Trade; Repair of Cars & Motorcycles	7.47	6.00
8	Transportation and Warehousing	5.28	3.12

9	Provision of Accommodation and Drinking Food	6.45	4.41
10	Information and Communication	11.72	5.85
11	Financial Services and Insurance	8.48	4.78
12	Real Estate	8.75	6.42
13	Company Services	11.72	4.30
14	Government Administration, Defense & Compulsory Social Security	7.95	5.43
15	Education Services	8.58	4.82
16	Health and Social Services	9.02	6.21
17	Other Services	7.66	5.72

Source: Research data processed, 2024.

Based on the growth rates of the economic sectors of Jayapura Regency and Papua Province, a Growth Ratio model analysis can be conducted to determine the Fast Growing economic sectors, Slow Growing economic sectors, Potential economic sectors, and Relatively Underdeveloped economic sectors in Jayapura Regency. The results of the Jayapura Regency Growth Ratio Model analysis show that all economic sectors of Jayapura Regency are classified as Fast-Growing sectors because they have an RPs value (Jayapura Regency economic sector growth) that is positive and greater than 1 and have an RPr value (Papua Province economic sector growth) which is also positive and greater than 1. The growth of the Jayapura Regency economic sectors ranges from 1.70 to 12.98 percent. Meanwhile, the growth of Papua Province's economic sectors ranged from 2.99 to 6.98 percent. All economic sectors of Jayapura Regency are fast-growing sectors because they are supported by inter-regional economic movements, where the Jayapura Regency area is well connected to other districts / cities in the Mamta customary area of Papua Province through the availability of adequate road infrastructure that can connect various economic activities between districts / cities. The results of the Jayapura Regency Growth Ratio Model analysis are in line with Setiawan et al. (2022), Rizani (2020) and Kharisma & Hadiyanto (2019) although there are still several economic sectors classified as potential sectors, slow-growing sectors and even relatively underdeveloped sectors in their findings. The Jayapura Regency Growth Model Ratio Analysis can be seen in Table 8 below:

Table 8. Jayapura Regency Growth Ratio Model Analysis Results

CRITERIA	RPr > 1 (+)	RPr < 1 (-)
RPs > 1 **(+)**	Fast Growing Sectors: Agriculture, Forestry and Fisheries; Mining and Quarrying; Manufacturing; Electricity and Gas Procurement; Water Procurement, Waste Management, Waste and Recycling; Construction; Wholesale and Retail Trade; Automobile and Motorcycle Repair; Transportation and Warehousing; Accommodation and Food Supply; Information and Communication; Financial and Insurance Services; Real Estate; Corporate Services; Government Administration, Defense and Compulsory Social Security; Educational	Slow Growing Sectors: -

	Services; Health Services and Social Activities; Other Services.	
RPs < 1 (-)	Potential Sectors: -	Relatively Underdeveloped Sector: -

Source: Research data processed, 2024.

Location Quotient (LQ) Analysis

To see the economic potential of Jayapura Regency which is the leading sector, an analysis is carried out using the Location Quotient (LQ) method. Location Quotient (LQ) analysis is used to determine the leading sector or economic base in the Jayapura Regency economy. Well-developed leading sectors can ultimately increase regional income optimally. The potential of economic sectors that are the leading sectors of Jayapura Regency is captured through the LQ values of the GRDP sectors as shown in Table 9 below:

Table 9. Results of LQ Analysis of Economic Sectors in Jayapura Regency

No	Economic Sector of GRDP	LQ Average Year 2012-2021	Criteria
1	Agriculture, Forestry, and Fisheries	1.98	Base
2	Mining and Quarrying	0.06	Non Base
3	Processing Industry	2.53	Base
4	Electricity and Gas Procurement	1.10	Base
5	Water Supply, Waste Management, Waste & Recycling	3.28	Base
6	Construction	1.16	Base
7	Wholesale & Retail Trade; Repair of Cars & Motorcycles	1.58	Base
8	Transportation and Warehousing	3.46	Base
9	Provision of Accommodation and Drinking Food	1.93	Base
10	Information and Communication	1.54	Base
11	Financial Services and Insurance	0.94	Non Base
12	Real Estate	1.89	Base
13	Company Services	1.79	Base
14	Government Administration, Defense & Compulsory Social Security	0.98	Non Base
15	Education Services	1.04	Base
16	Health and Social Services	1.02	Base
17	Other Services	1.58	Base

Source: Research data processed, 2024.

The results of the LQ Analysis of the GDP sectors of Jayapura Regency for the last 10 years, namely during the 2012-2021 period, show that out of 17 GDP economic sectors, there are only 14 economic sectors that are superior or basic sectors in Jayapura Regency because they have an LQ value> 1. These economic sectors are the Agriculture, Forestry and Fisheries sector; Processing

Industry sector; Electricity and Gas Procurement sector; Water Procurement, Waste Management, Waste & Recycling sector; Construction sector; Wholesale & Retail Trade sector; Car & Motorcycle Repair sector; Transportation and Warehousing sector; Accommodation and Drinking Food Provision sector; Information and Communication sector, Real Estate sector; Corporate Services sector; Education Services sector; Health Services and Social Activities sector; and other Services sector. Meanwhile, there are also 3 economic sectors that are not superior or are non-base sectors because they have an LQ value < 1. The three non-base sectors include the Mining and Quarrying sector; the Financial Services and Insurance sector; and the Government Administration, Defense and Compulsory Social Security sector. The results of the LQ analysis in this study are generally in line with previous studies (Nurriyanti & Setyowati, 2024; Shinta, 2022; Setiawan et al., 2022; Mesoino et al., 2022; Rizani, 2020; Sarwo et al., 2019; Kharisma & Hadiyanto, 2019; and Srivani et al., 2018), although there are several economic sectors with different categories where there are basic sectors in this study that are classified as non-basic sectors in other regions or vice versa.

Shift-Share Analysis (SSA)

In addition to using LQ analysis, to determine the leading sectors of the economy, mapping is also done using shift-share analysis as shown in Table 10.

The results of the shift share analysis of the Esteban-Marquillas approach show that there are only 15 economic business sectors that have a competitive advantage or are well competitive, and are specialized in Jayapura Regency. Meanwhile, there is 1 economic sector that does not have a competitive disadvantage or is less competitive, and is also not specialized in Jayapura Regency, namely the Mining and Quarrying sector. In addition, the results of the shift share analysis of the Esteban-Marquillas approach also show that there is one economic sector that, although it has a competitive advantage, is not specialized in Jayapura Regency, namely the Financial Services and Insurance sector. The results of the Jayapura Regency shift-share analysis are in line with the findings of previous researchers (Nurriyanti & Setyowati, 2024; Shinta, 2022; Nalle et al., 2022; Mesoino et al., 2022; Rizani, 2020; Sarwo et al., 2019; Kharisma & Hadiyanto, 2019; and Srivani et al., 2018) although there are several economic sectors that have different categories where there are economic sectors that have competitive and specialized advantages in this study, but are classified as sectors that do not have competitive advantages and or are not specialized in other research areas or vice versa, 2018) although there are some economic sectors with different categories where there are economic sectors that have competitive and specialized advantages in this study, but are classified as sectors that do not have competitive advantages and or are not specialized in other research areas or vice versa.

Table 10. Results of Esteban-Marquillas Shift-Share Analysis of Jayapura Regency

No	Economic Sector of GRDP	Aij	Component		Criteria
			Eij-E'ij	rij-rin	
1	Agriculture, Forestry, and Fisheries	18.18	714639.60	12989186.76	04
2	Mining and Quarrying	-20.27	-2222199.50	45046764.66	02
3	Processing Industry	17.23	213654.90	3680521.43	04
4	Electricity and Gas Procurement	3.03	424.74	1288.86	04
5	Water Supply, Waste Management, Waste & Recycling	13.93	8060.65	112246.23	04
6	Construction	113.46	7088.15	804196.50	04

7	Wholesale & Retail Trade; Repair of Cars & Motorcycles	22.51	337324.81	7592521.34	**04**
8	Transportation and Warehousing	18.70	563339.74	10535683.95	**04**
9	Provision of Accommodation and Drinking Food	23.79	34180.18	813309.82	**04**
10	Information and Communication	102.12	103731.64	10592694.67	**04**
11	Financial Services and Insurance	54.99	-5493.55	-302070.85	**03**
12	Real Estate	36.70	127402.18	4676296.03	**04**
13	Company Services	123.24	30579.12	3768712.40	**04**
14	Government Administration, Defense & Compulsory Social Security	38.73	30289.08	1172978.74	**04**
15	Education Services	57.21	6902.97	394888.92	**04**
16	Health and Social Services	45.74	9704.33	443840.53	**04**
17	Other Services	29.14	40374.47	1176574.79	**04**

Source: Research data processed, 2024.

Klassen Typology Analysis of the GRDP Sector Approach

The Klassen Typology analysis of the GRDP sector approach is carried out by comparing the average growth rate of each GRDP economic sector and its average contribution in Jayapura Regency with Papua Province over the past ten years (2012-2021 period). The results of the Klassen typology analysis of the GRDP sector approach are shown in Table 11 below:

Table 11. Results of Klassen Typology Analysis of the GRDP Sector Approach

CRITERIA		Contributions of Sectors to GRDP	
		yi > y	**yi < y**
Sector Growth Rate	**ri > r**	Advanced and Fast-Growing Sectors: Agriculture, Forestry and Fisheries; Manufacturing; Electricity and Gas Procurement; Water Procurement, Waste Management, Waste and Recycling; Construction; Wholesale and Retail Trade; Automobile and Motorcycle Repair; Transportation and Warehousing; Accommodation and Food Supply; Information and Communication; Real Estate; Corporate Services; Government Administration, Defense and Compulsory Social Security; Educational Services; Health Services and Social Activities; Other Services.	Fast Growing Sectors: Financial Services and Insurance
	ri < r	Advanced but Depressed Sectors: -	Relatively Underdeveloped Sectors: Mining and Quarrying

Source: Research data processed, 2024.

The results of the Klassen typology analysis of the GRDP sector approach shown in Table 11 above show that there are 15 economic sectors that are developed and fast-growing sectors in Jayapura Regency. These economic sectors have high average growth rates and high average contributions compared to Papua Province. In addition, there is one fast-growing economic sector in Jayapura Regency, namely the Financial Services and Insurance sector. However, there is still 1 economic sector that is relatively lagging behind, namely the Mining and Quarrying sector. This is because the average growth rate of the Mining and Quarrying sector in Jayapura Regency and its average contribution are lower than those in Papua Province. The results of the sectoral Klassen typology analysis in this study are generally in line with the results of previous studies (Shinta, 2022; Nalle et al., 2022; Setiawan et al., 2022; Sarwo et al., 2019; and Srivani et al., 2018), although there are several economic sectors that have different categories where there are developed and fast-growing sectors in this study, but classified as fast-growing sectors, and or developed but depressed sectors, and or even as relatively underdeveloped sectors in other research areas or vice versa.

Klassen Typology Analysis of Leading Sector Approach

The Klassen Typology Analysis of the Leading Sector approach is conducted by comparing the Shift-Share value and the LQ value obtained in the previous analysis in Table 9 (LQ analysis results) and Table 10 (Esteban-Marquillas Shift-Share analysis results). The results of the Klassen typology analysis of the leading sector approach are shown in Table 12 below:

Table 12. Results of the Klassen Typology Analysis of the Leading Sector Approach

CRITERIA	Shift Share (+)	Shift Share (-)
LQ > 1	Leading Sectors: Agriculture, Forestry, and Fisheries; Manufacturing Industry; Electricity and Gas Supply; Water Supply, Waste Management, Waste and Recycling; Construction; Wholesale and Retail Trade; Car and Motorcycle Repair; Transportation and Warehousing; Provision of Accommodation and Food and Beverage; Information and Communication; Real Estate; Company Services; Education Services; Health Services and Social Activities; Other Services.	Potential Sectors: -
LQ < 1	Potential Sectors: Government Administration, Defense and Compulsory Social Security.	Relatively Underdeveloped Sectors: Mining and Quarrying; Financial Services and Insurance.

Source: Research data processed, 2024.

The results of the Klassen typology analysis of the leading sector approach as seen in Table 12 above show that there are 14 economic sectors that are leading sectors in Jayapura Regency. These economic sectors have positive Shift-Share values and LQ values > 1 (LQ is greater than 1). In addition, there is 1 economic sector that has the potential to develop in Jayapura Regency, namely

the Government Administration, Defense and Mandatory Social Security sectors. This sector is potential because it has a positive Shift-Share value even though the LQ value is <1 (LQ is less than 1). However, there are still 2 economic sectors that are relatively underdeveloped, namely the Mining and Quarrying sector, and the Financial Services and Insurance sector. This is because both sectors have negative Shift-Share values and LQ values <1 (LQ is less than 1).

Overlay Model Analysis of Jayapura Regency

The analysis of the Overlay Model of the Leading Sectors of Jayapura Regency was carried out by comparing the results of the Klassen Typology analysis of the PDRB Sector Approach (Growth and Contribution) in Table 11 with the results of the Klassen Typology analysis of the Leading Sectors Approach (LQ and Shift-Share) in Table 12. The results of the Overlay Model Analysis of the Leading Sectors of Jayapura Regency can be seen in Table 13 below:

Table 13. Results of the Overlay Model Analysis of the Leading Sectors of JayapuraRegency

Criteria for Developing Leading Sectors in Jayapura Regency	Klassen Typology of PDRB Sector Approach (Growth & Contribution)			
	Advanced and Fast Growing Sectors	Advanced but Depressed Sectors	Rapidly Developing Sectors	Relatively Underdeveloped Sectors
Klassen Typology of Leading Sector Approach (LQ & Shift-Share) — Leading Sectors	Leading Sectors of Jayapura Regency: Agriculture, Forestry, and Fisheries; Manufacturing Industry; Electricity and Gas Supply; Water Supply, Waste Management, Waste and Recycling; Construction; Wholesale and Retail Trade; Car and Motorcycle Repair; Transportation and Warehousing; Provision of Accommodation and Food and Beverages; Information and Communication; Real Estate; Corporate Services; Educational Services; Health Services and Social Activities; Other Services.	Advanced but Depressed Sectors that can become Leading: -	Sectors that are Rapidly Developing to Become Leading: -	Underdeveloped Sectors that have the Potential to Become Leading: -
Potential Sectors	Potential Sectors that are Rapidly Growing and Developing: Government Administration, Defense and Compulsory Social Security.	Potential Sectors that can Advance but are Depressed: -	Potential Sectors that are Rapidly Growing: -	Potential Underdeveloped Sectors: -
Relatively Underdeveloped Sectors	Underdeveloped Sectors that are Rapidly Growing: -	Underdeveloped Sectors that can	Underdeveloped Sectors that are Rapidly Growing:	Severely Underdeveloped Sectors:

	Advance but are Depressed: -	Financial Services and Insurance	Mining and Quarrying

Source: Research data processed, 2024.

The results of the Jayapura Regency Leading Sector Overlay Model analysis shown in Table 13 above show that there are fourteen economic sectors that are leading sectors in Jayapura Regency. These economic sectors are developed and fast-growing sectors (in terms of the Klassen typology of the GDP sector approach) and are leading sectors (in terms of the Klassen typology of the leading sector approach). The economic sectors that are the leading sectors in Jayapura Regency include: the Agriculture, Forestry and Fisheries sector; the Manufacturing Industry sector; the Electricity and Gas Procurement sector; the Water Procurement, Waste Management, Waste and Recycling sector; the Construction sector; the Wholesale and Retail Trade sector; the Car and Motorcycle Repair sector; the Transportation and Warehousing sector; the Accommodation and Drinking Food Provision sector; the Information and Communication sector; the Real Estate sector; the Corporate Services sector; the Education Services sector; the Health Services and Social Activities sector; and other Services sectors.

The results of the analysis also show that there is one potential economic sector to develop in Jayapura Regency, namely the Government Administration, Defense and Compulsory Social Security sector. This sector is potential because it has a positive Shift-Share value even though the LQ value is < 1 (LQ is smaller than 1). This sector has the potential to be developed because it is a sector that routinely runs every year, but needs to be managed better so that it can contribute more to the economy of Jayapura Regency.

However, there are still two economic sectors that are relatively lagging behind, namely the Mining and Quarrying sector, and the Financial Services and Insurance sector. This is because both sectors have negative Shift-Share values and LQ values < 1 (LQ is smaller than 1). This is because the Mining and Quarrying sector in Jayapura Regency only comes from the C mining material sub-sector and there are no mining products that can make a major contribution to this sector in Jayapura Regency.

CONCLUSSIONS AND RECOMMENDATION

Conclussions

Various analyses conducted on the economic sectors of Jayapura Regency show that Jayapura Regency has fourteen leading economic sectors that play an important role in driving the economic activities and economic development of Jayapura Regency. The economic sectors that are the leading sectors in Jayapura Regency include: the Agriculture, Forestry and Fisheries sector; the Manufacturing Industry sector; the Electricity and Gas Procurement sector; the Water Procurement, Waste Management, Waste and Recycling sector; the Construction sector; the Wholesale and Retail Trade sector; the Car and Motorcycle Repair sector; the Transportation and Warehousing sector; the Accommodation and Drinking Food Provision sector; the Information and Communication sector; the Real Estate sector; the Corporate Services sector; the Education Services sector; the Health Services and Social Activities sector; and other Services sectors.

Jayapura Regency still has two relatively underdeveloped economic sectors, namely the Mining and Quarrying sector, and the Financial Services and Insurance sector. For this reason, it is necessary to further map the natural conditions in various sub-districts and villages in Jayapura Regency related to the natural potentials owned that produce mining products or other minerals

so that they can be managed properly and correctly so that they can make a large contribution to the Mining and Quarrying economic sector in Jayapura Regency. In addition, Jayapura Regency has a potential Government Administration, Defense and Compulsory Social Security sector to be developed because it is a sector that routinely runs every year, but needs to be managed better so that it can contribute more to the Jayapura Regency economy.

Recommendation

This study suggests that further mapping of sub-sectors that are superior in each economic sector of Jayapura Regency be conducted and mapping of superior products that can be developed from each of these superior sectors should be conducted. For example, for the Agriculture, Forestry, and Fisheries Sector as the primary sector that is the basis or first superior sector of Jayapura Regency, mapping of the sub-sectors that are superior in this sector can be conducted so that superior products from the Agriculture, Forestry, and Fisheries sectors can be developed, one of which is through the establishment of a Regional-Owned Enterprise of Jayapura Regency with productive business units engaged in the Agriculture, Forestry, and Fisheries sectors.

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