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Research Article

Analysis of Leading Sectors in Karo Regency for the 2019-2023 Period

Graciela Br Sembiring¹, Selfiana LumbanBatu², Hernita Siagian³

State University of Medan, Indonesia

*Correspondence: gracielabrsembiring@mhs.unimed.ac.id

Keywords:	Abstract				
Leading Sectors, Economic, Karo Regency	This study aims to determine the leading and non-leading sectors in the economy of Karo Regency, to determine the sectors that have the greatest influence on Karo Regency. The data used in this study are secondary data sourced from the Central Statistics Agency (BPS). The data included in this study are the 2019-2023 GRDP of Karo Regency at Current Prices and the GRDP of North Sumatra. Accompanied by other secondary data that are relevant to the purpose of this writing using the LQ and Shift share analysis methods. The results of this study obtained that the leading sectors are: the agriculture, forestry and fisheries sector, the transportation and warehousing sector, the government administration, defense and mandatory social security sector, the education services sectors. And the sectors that have the greatest competitiveness in Karo Regency are: the agriculture, forestry and fisheries sector.				

Introduction

The general economic condition has a direct influence on the condition of society in general, the better the economic condition, the more opportunities it will provide for society to improve its welfare. This can be interpreted that a good level of public welfare can provide a good picture of the economy in general at a certain time. The leading sector is a reflection of an economic structure, so it can also be seen as one of the aspects that characterize or characterize an economy (Hajeri, et al. 2015).

GRDP is an indicator of economic growth and development of a region. To increase economic growth, there must be effectiveness and efficiency of economic development, so the implementation of economic development needs to be directed at sectors that are able to provide a large multiplier effect on other sectors and the economy as a whole (Ariyanto, 2013).

The theory of economic development emphasizes the importance of exploring local potential to drive economic growth. This theory explains that economic development is not only aimed at increasing income, but also improving the economic structure of a region through the utilization of existing resources (Todaro & Smith, 2015). By focusing on leading sectors, economic development is expected to run more effectively, because these sectors are believed to have a multiplier effect on other sectors. According to Tambunan (2001), the

essence of the objectives of national economic development and regional economic development do not differ significantly even though the development process in the regions is more specific. Economic growth in the regions is specifically influenced by comparative advantages, regional specialization, and the economic potential of the region concerned. Therefore, in an effort to realize the sustainability of economic development in the regions, it is necessary to prioritize the exploration, development and utilization of all economic potential owned by the region (Arsyad, 1999).

The benchmark for the success of economic development in a region is by measuring the level of economic growth in the region. Development always has positive and negative impacts, because of this, indicators are needed as a benchmark to assess the success of development. The paradigm regarding development tends to identify the success of economic growth reaching high values in the region on condition that the government and its people participate in achieving the goals of increasingly large economic development in order to be able to run the wheels of the economy in the community to achieve the desired development (Aminatul Maghfiroh, 2021).

The leading sector as a sector that is quite important in the economic development of a region, does not only refer to the geographical location but also to the sectors that are spread across various economic channels. So that it is able to drive all economic sectors. The leading sector is a sector that can drive growth and development for other sectors. The leading sector is an economic sector that can make a significant contribution to the GRDP and has a positive influence if the leading sector is developed properly, then the regional economy in general will increase from other regions (Aminatul Maghfiroh, 2021).

Tumenggung stated that the leading sector is a sector that has competitive and comparative advantages when compared to the same sector in other regions, and has a high level of demand both in the local market and the export market. In addition, the leading sector is also able to provide added value and large production so that a multiplier effect is created for the economy (Irmansyah, 2019).

Determining the leading sector using PDRB data is very important in planning as a priority step for development due to limited development funds, while the leading sector is the main driver of regional development (Zaini, 2019). Indahsari and Listiana (2021) stated that a sector can be said to be a leading sector if: (1) it has high specialization or is able to meet local or outside regional needs (can be analyzed using the Location Quotient technique); (2) it has positive growth and a large contribution to the local region and the regions above it.

According to Rizani (2017), there are two main factors that need to be considered in identifying the potential for regional economic activities, namely the superior economic sector factor that has been competitive in the last few years and the economic sector that has the potential to be developed in the future. By identifying the potential for regional economic activities, development policies can be formulated based on efforts to increase economic growth.

Karo Regency as one of the regencies in North Sumatra Province is an autonomous region that has a role in realizing national development through regional development achievements. In accordance with Presidential Regulation No. 62 of 2011 concerning the Metropolitan Spatial Plan of Mebidangro, Karo Regency is one of the regions designated as a national strategic area in North Sumatra Province. The strategic geographical location of Karo Regency and the availability of abundant natural resources make Karo Regency have an important and strategic role in the development of the Indonesia-Thailand-Singapore Regional Economic Triangle (IMT-GT).

Karo Regency has abundant natural resources and various economic sectors that contribute to the growth of its region. The natural potential in this area, such as the agricultural, plantation, and tourism sectors, make Karo Regency one of the important pillars in the regional economy. Therefore, economic development in this area is greatly influenced by the introduction and development of leading sectors that are able to drive economic growth in the long term.

The main problem in this study is the uncertainty regarding the leading sectors that can support the economic development of Karo Regency. This study aims to identify these sectors and provide recommendations

regarding sectors that need to be further developed in order to have a significant impact on regional economic growth.

Business Field	GRDP of Karo Regency (Billion Rupiah)						
	2019	2020	2021	2022	2023		
A. Agriculture, Forestry and Fisheries	10,964.80	11,268.55	11,779.76	13,005.30	14,193.51		
B. Mining and Excavation	46.15	43.60	45.13	49.09	53.89		
C. Processing Industry	763.53	779.12	829.08	923.06	1,007.98		
D. Procurement of Electricity and Gas	14.55	15,16	15.86	16.90	17.83		
E. Water Supply, Waste Management, Waste and Recycling	17.43	17.67	17.96	18.52	19.44		
F. Construction	1,569.10	1,558.60	1,605.89	1,728.21	1,849.38		
G. Wholesale and Retail Trade, Car and Motorcycle Repair	2,212.37	2,217.78	2,370.49	2,668.59	3,000.17		
H. Transportation and Warehousing	948.56	948.64	969.86	1,107.80	1,363.86		
I. Provision of Accommodation and Food and Beverages	540.50	537.68	546.07	589.96	650.67		
J. Information and Communication	156.34	165.95	181.03	198.46	215.12		
K. Financial Services and Insurance	284.02	284.02	313.91	354.53	368.64		
L. Real Estate	713.56	733.56	743.09	813.29	880.29		
M,N. Corporate Services	42.83	42.73	43.71	47.85	53.20		
O. Government Administration, Defense and Compulsory Social Security	1,254.02	1,283.32	1,259.39	1,274.18	1,409.08		
P. Educational Services	500.37	510.59	530.66	557.11	616.15		
Q. Health Services and Social Activities	270.65	279.72	278.51	296.11	337.10		
R,S,T,U. Other Services	285.93	287.88	293.73	326.61	372.67		
GRDP	20,584.73	20,974.57	21,824.14	23,975.57	26,408.97		

 Table 1

 GRDP of Karo Regency (Billion Rupiah)

Source: BPS Karo Regency

Based on the Gross Regional Domestic Product data at Current Prices, it was obtained that the GRDP in Karo Regency has increased every year from 2019 to 2023. This study was conducted in Karo Regency to determine which sectors are basic and non-basic sectors and sectors that have the potential to be developed to improve regional development. So this study takes the title "Leading Sectors in Karo Regency for the 2019-2023 Period". Therefore, it is important to clearly identify the basic and non-basic sectors that have the potential to be developed, so that these potential sectors can drive economic growth in Karo Regency.

Method

This research is a descriptive research type. Of course, this study also uses a quantitative approach by measuring numerical data that aims to answer the problems in the study. Secondary data is used in this study. The time series data used is PDRB (Gross Regional Domestic Product) data from 2019 to 2023. The data sources used come from BPS (Central Statistics Agency) from Karo Regency and BPS North Sumatra. The data analysis method used in this study is location quotient (LQ) analysis and shift share analysis. The location quotient method is a method intended to see the relative contribution of the addition of a regional sector to its contribution on a scale above it, both provincial and national.LQ is used to determine the level of specialization of the basic sector or leading sector in a region (Irmansyah, 2019). This technique is basically to identify which internal potential sectors are owned by the region and then divide them into two parts, namely basic and non-basic. This analysis is used to formulate a shift in the regional basic sector based on GRDP data as an indicator of regional growth value.

1. Location Quotient Analysis

The formula for calculating the Location Quotient is as follows (Sihombing, 2018):

$$LQ = (vi/vt)/(Vi/Vt)$$

Information:

vi = GRDP value of City A sector

vt = Total GRDP of City A

Vi = GRDP value of Province A sector

Vt = Total GRDP of Province A

In the calculation above, it means that:

LQ > 1, meaning that this sector, namely the basic sector, will form a region's ability to export products outside the region concerned.

LQ < 1, meaning that the sector is a non-basic sector which is an importer.

LQ = 1, meaning that there is a tendency for the sector to be closed so that transactions have been carried out outside the region, but this condition is difficult to find in a regional economy.

2. Shift share (SS) analysis

The formula for calculating Shift Share is as follows (Imaningsih Niniek, 2015):

$$\begin{split} \Delta Q_{ij}^{t} &= Q_{ij}^{0} \left\{ \frac{Y_{t}}{Y_{0}} - 1 \right\} + Q_{ij}^{0} \left\{ \frac{Q_{i}^{t}}{Q_{1}^{0}} - \frac{Y_{t}}{Y_{0}} \right\} + Q_{ij}^{0} \left\{ \frac{Q_{ij}^{t}}{Q_{ij}^{0}} - \frac{Q_{i}^{t}}{Q_{i}^{0}} \right\} \\ PR_{ij} &= Q \frac{0}{ij} \left\{ \frac{Y_{t}}{Y_{0}} - 1 \right\} \end{split}$$

If $PR < \Delta Qtij$, it means that the growth of the City or Regency sector tends to encourage provincial growth, and vice versa, if $PR > \Delta Qtij$, it means that the growth of the City or Regency sector tends to inhibit provincial growth.

$$PS_{ij} = Q_{ij}^0 \left\{ \frac{Q_i^t}{Q_1^0} - \frac{Y_t}{Y_0} \right\}$$

If PS < 0, it means that this sector is growing relatively slowly in the City or Regency, and vice versa, if PS > 0, it means that this sector is growing relatively quickly in the City or Regency.

$$\mathrm{DS}_{ij} = \mathrm{Q}_{ij}^{0} \left\{ \frac{\mathrm{Q}_{ij}^{\mathrm{t}}}{\mathrm{Q}_{ij}^{0}} - \frac{\mathrm{Q}_{i}^{\mathrm{t}}}{\mathrm{Q}_{j}^{0}} \right\}$$

If DS < 0 means this sector has slower growth compared to the same sector in the City or Regency, and vice versa DS > 0 means the sector has faster growth compared to the same sector in the City or Regency.

Where:

Yt = GRDP of Province A for the period of the year

t Y0 = GRDP of Province A in the base year period Qit = GRDP of Province A sector i in year t Qi0 = GRDP of Province A sector i in the base year Qijt = GRDP of City A in year t Qij0= GRDP of City A in the base year

Results and Discussion

Location Quotient (LQ) Analysis

Location Quotient (LQ) analysis is used to determine the economic sectors in PDRB that can be classified into basic and non-basic sectors. LQ is a comparison of the magnitude of the role of a sector in a Regency to the magnitude of the role of the sector at the North Sumatra Province level.

LQ value > 1 means that the role of a sector in the city is more dominant than the sector at the provincial level and as an indication that the city has a surplus of the sector's products. Conversely, if the LQ value < 1 means that the role of the sector is smaller in the city compared to its role at the provincial level. The LQ value can be said to be an indication to be used as a basis for determining potential sectors to be developed. Because the sector can not only meet the needs in the region, but can also meet the needs in other regions or surplus.

For the results of the analysis of economic sectors in Karo Regency using the LQ or Location Quotient method, it can be described in table 1 as below. From this LQ analysis, it will be known which sectors are included in the basic and non-basic sectors of Karo Regency. For the basic sector, the LQ value shows >1 while for the LQ value <1, it indicates that the sector is included in the non-basic sector.

Business Field	LQ					Average	Information	
Busiliess Field	2019	2020	2021	2022	2023	Average	mormation	
A. Agriculture, Forestry and Fisheries	2.26	2.52	2.45	2.36	2.62	2.44	Base	
B. Mining and Excavation	0.19	0.16	0.17	0.17	0.16	0.17	Non-Basic	
C. Processing Industry	0.20	0.19	0.19	0.20	0.20	0.20	Non-Basic	
D. Procurement of Electricity and Gas	0.68	0.63	0.63	0.63	0.59	0.63	Non-Basic	
E. Water Supply, Waste Management, Waste and Recycling	0.95	0.82	0.81	0.82	0.74	0.83	Non-Basic	
F. Construction	0.58	0.55	0.55	0.54	0.49	0.54	Non-Basic	
G. Wholesale and Retail Trade, Car and Motorcycle Repair	0.56	0.56	0.57	0.59	0.60	0.58	Non-Basic	
H. Transportation and Warehousing	0.91	1.01	1.07	1.02	1.02	1.00	Base	
I. Provision of Accommodation and Food and Beverages	1.25	1.18	1.22	1.21	1.02	1.17	Base	
J. Information and Communication	0.33	0.35	0.35	0.36	0.38	0.35	Non-Basic	
K. Financial Services and Insurance	0.48	0.47	0.48	0.50	0.48	0.48	Non-Basic	
L. Real Estate	0.74	0.66	0.67	0.69	0.65	0.68	Non-Basic	
M,N. Corporate Services	0.20	0.19	0.19	0.19	0.19	0.19	Non-Basic	
O. Government Administration, Defense and Compulsory Social Security	2.03	1.65	1.63	1.68	1.45	1.69	Base	

Table 2 LQ analysis

P. Educational Services	1.39	1.27	1.31	1.31	1.26	1.31	Base
Q. Health Services and Social Activities	1.40	1.29	1.29	1.30	1.25	1.31	Base
R,S,T,U. Other Services	2.40	2.42	2.47	2.46	2.42	2.42	Base

Source: Processed data, 2024

From the LQ table above, it can be seen that there are several sectors in Karo Regency that are included in the basic sector and the rest are included in the non-basic sector. Those included in the basic sector are indicated by an LQ value> 1, while for an LQ value <1, the sector is included in the non-basic sector.

From table 2, the column shows the average LQ value. What is meant by the average LQ value is the average LQ value of sector i during the observation period, namely 2019-2023. The results of this average LQ value are used to avoid the annual bias value of a sector's LQ so that the average LQ value is used to calculate the LQ value of a sector.

The basic sectors in Karo Regency include (1) the sectoragriculture, forestry and fisheries (2) transportation and warehousing sector, (3) accommodation and food and beverage provision sector, (4) government administration, defense and compulsory social security sector, (5) education services (6) health services and social activities sector, (7) other service sectors. Of the seven basic sectors, the agriculture, forestry and fisheries sector is the sector with the largest LQ value, namely 2.44. This can be interpreted that the seven sectors have good potential to be developed so that the many economic activities in this sector will also have an impact on the economic activities of other sectors.

Meanwhile, the non-basic sectors in Karo Regency include (1) the sectormining and quarrying, (2) manufacturing industry sector, (3) electricity and gas supply sector, (4) water supply sector, waste management, waste and recycling, (5) construction sector, (6) wholesale and retail trade sector, car and motorbike repair, (7) information and communication sector, (8) financial services and insurance sector, (9) real estate sector, (10)company services. Of the ten non-basic sectors, the mining and excavation sector has the smallest LQ value. Attention is needed to these non-basic sectors so that when making policies, they can be focused on these sectors so that they can increase and hopefully become basic sectors.

Shift-Share Analysis(ASS)

Shift-share analysis is used to determine the economic growth process of Karo Regency in relation to the regional economy as a reference, namely North Sumatra Province. Shift-Share analysis in this study uses income variables, namely GRDP to describe the economic growth of Karo Regency.

Total GRDP growth (Y) can be broken down into shift components and share components, namely:

- a. National Growth Component (NGR) is the amount of increase in the GRDP of Karo Regency if its growth is the same as the growth rate of the GRDP of North Sumatra Province during the study period.
- b. Proportional Growth Component (KPP), measures the magnitude of the net shift of Karo Regency caused by the composition of the changing sectors of the GRDP of Karo Regency. If P>0, it means that Karo Regency specializes in sectors that at the North Sumatra Province level are growing relatively quickly and if P<0, it means that Karo Regency specializes in sectors at the North Sumatra Province level whose growth is slower or is declining.
- c. The Regional Share Growth Component (KPPW) measures the magnitude of the net shift caused by certain sectors that grow faster or slower in Karo Regency compared to North Sumatra Province caused by internal locational factors, such as good resources will have a positive KPPW (KPPW > 0), conversely if the location is not favorable it will have a negative KPPW (KPPW <0).

The results of the shift-share analysis calculations are listed in table 3 below. The table contains the results of the analysis.National Growth Component (KPN),Proportional Growth Component (KPP), Regional Share Growth Component (KPPW) and the total value of ΔY .

Table 3The results of the shift-share analysis

No	Sector	National Growth Component (KPN)/ provincial share (PS)	Proportional Growth Component (KPP)/proportional shift (P)	Growth ComponentsShareRegion (KPPW)/differential shift (D)	SSA/ΔΥ
1	A. Agriculture, Forestry and Fisheries	-0.24	-0.10	0.63	0.29
2	B. Mining and Excavation	-0.24	0.04	-0.04	-0.23
3	C. Processing Industry	-0.24	0.61	-0.52	-0.15
4	D. Procurement of Electricity and Gas	-0.24	0.00	0.00	-0.24
5	E. Water Supply, Waste Management, Waste and Recycling	-0.24	0.00	0.00	-0.24
6	F. Construction	-0.24	0.46	-0.29	-0.07
7	G. Wholesale and Retail Trade, Car and Motorcycle Repair	-0.24	0.61	-0.33	0.03
8	H. Transportation and Warehousing	-0.24	0.16	-0.04	-0.11
9	I. Provision of Accommodation and Food and Beverages	-0.24	0.08	-0.02	-0.18
10	J. Information and Communication	-0.24	0.07	-0.05	-0.22
11	K. Financial Services and Insurance	-0.24	0.09	-0.06	-0.21
12	L. Real Estate	-0.24	0.17	-0.08	-0.16
13	M,N. Corporate Services	-0.24	0.03	-0.03	-0.23
14	O. Government Administration, Defense and Compulsory Social Security	-0.24	0.12	0.01	-0.11
15	P. Educational Services	-0.24	0.06	0.00	-0.18
16	Q. Health Services and Social Activities	-0.24	0.03	0.00	-0.21
17	R,S,T,U. Other Services	-0.24	0.02	0.02	-0.21

Source: Processed data, 2024

Table 3 indicates the presence of positive and negative values in the analysis of the results of the Karo Regency shift share in 2019-2023. The meaning of the positive value indicates that in the Karo Regency area there is a sector specialization that shows rapid growth in North Sumatra Province. However, there are still negative values where these values indicate that the specialization is the same as the upper level and is growing slowly. Table 3 shows that the KPP value that has a positive number is in 16 sectors, namely (1) the sectormining and quarrying,(2) sectorsprocessing industry,(3) sectorselectricity and gas supply,(4) sectorswater supply, waste management, waste and recycling,(5) sectorsconstruction,(6) sectorsprovision of accommodation and food and drink, (9) sectorsinformation and communication, (10) sectorsfinancial and insurance services, (11) sectorsreal estate,(12) sectorscompany services, (13) sectorsgovernment administration, defense and compulsory social security, (14) sectorseducational services,(15) sectorshealth services and social activities, and (16) sectorsother services. And the rest is at a negative proportional value, namely the sectoragriculture,

forestry and fisheries.

Based on table 3, the value of the Regional Share Growth Component (KPPW) in Karo Regency can also be seen. The results of the analysis also show positive and negative values. The indication of the positive value shows that the economic sector in Karo Regency can grow at a better rate compared to the upper level, namely the provincial level. However, if there is a sector that still has a negative value, then the sector is growing slower than the same sector in North Sumatra Province. There are ten sectors that have negative values, namely (1) the sectorMining and Quarrying,(2) sectorsProcessing industry, (3) sectorsConstruction, (4) sectorsWholesale and Retail Trade, Car and Motorcycle Repair, (5) sectorsTransportation and Warehousing, (6) sectorsProvision of Accommodation and Food and Beverages, (7) sectorsInformation and Communication, (8) sectorsFinancial Services and Insurance, (9) sectorsReal Estate, and (10) corporate service sectors.

While the rest have positive values, so that the positive value sectors have potential and competitiveness and are predicted to be able to grow quickly. Several sectors that have positive values are (1) the sectorAgriculture, Forestry and Fisheries,(2) sectorsElectricity and Gas Procurement, (3) sectorsWater Supply, Waste Management, Waste and Recycling, (4) sectorsGovernment Administration, Defense and Compulsory Social Security, (5) sectorsEducational Services,(6) sectorsHealth Services and Social Activities, as well as(7) sectorsOther Services.

The results of this study are consistent with Ariyanto's (2013) study which found that the agricultural and educational services sectors are leading sectors in various regions with similar economic characteristics. In addition, this study is also in line with the findings of Irmansyah (2019) which emphasizes that the transportation and warehousing sectors have an important role in the regional economy with developing infrastructure. However, this study provides a new contribution by showing that the accommodation and food and beverage provision sector in Karo Regency has greater potential compared to the same sector in other regions, as found by Devi and Darsana (2019) in Bangli Regency.

Conclusion

The results of the study conducted on the analysis of the leading economic sectors in Karo Regency in 2019-2023 can be concluded, namely based on the LQ analysis stating that there are 7 basic sectors. The LQ analysis shows that the agricultural sector is the backbone of the Karo Regency economy. The potential for further development is still very large, especially in terms of product diversification, increasing productivity, and market development. The local government needs to focus on improving agricultural sector. If you look at the shift share analysis with indicators in the assessment of the regional share growth component, there are 7 sectors that have positive values. The local government should concentrate on the basic sector because this sector is competitive and makes a significant contribution to this region.

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