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Research Article

Analysis Determination of Leading Sectors area Economy in the city Medan: LQ AND Shift Share Approach

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Abstract

This study aims to identify leading sectors in Medan City using the Location Quotient (LQ) and Shift-Share Analysis (SSA) methods with Gross Regional Domestic Product (GRDP) data from 2019 to 2023. Medan City, as a strategic economic center in North Sumatra, plays an important role in trade, industry, and services. This study uses secondary data from the Central Statistics Agency (BPS) of Medan City and North Sumatra to analyze economic sectors that contribute significantly to regional GRDP. Through the LQ method, this study successfully identified sectors that have higher competitive advantages compared to the national average, such as water supply, waste, construction, wholesale trade, transportation, accommodation, information and communication, and financial services.

Introduction

Medan City, the capital of North Sumatra Province, is one of the most dynamic economic centers in Indonesia. Medan is an important center of trade, industry, and services on the island of Sumatra, and has a strategic role in the distribution of goods and services because it is the gateway to the economy of the western region of Indonesia. This city is the center of regional economic growth due to its good location and large population. In this case, an important tool for evaluating the performance of the economic sector of Medan City is an economic analysis based on the regional gross domestic product (GRDP) of the business area (Central Bureau of Statistics, 2023). GDP shows the total economic output of a region and shows the contribution of each sector to the overall economy. Local governments and stakeholders can determine which sectors are the main drivers of the economy and by mapping the GDP of the business sector.

Table 1. Products Domestic Gross Regional Product (PBRB) of Medan City Based on Constant Prices According to Business Field (2019-2023)

Medan City GRDP Based on Current Prices According to Business Field (Billion Rupiah)						
No.	sector	2019	2020	2021	2022	2023
1	Agriculture, Forestry and Fisheries	2,692	2.695	2,503	2,676	2,819

2	Mining and Quarrying	2	2	3	3	3
3	Processing industry	34,414	34,186	36,234	39,700	42,680
4	Electricity and Gas Procurement	222	233	249	265	280
5	Water Supply, Waste Management, Waste and Recycling	458	490	508	528	556
6	Construction	46,723	45,611	49,100	53,505	56,405
7	Wholesale and Retail Trade, Car and Motorcycle Repair	61,710	62,278	66,287	73,542	80,788
8	Transportation and Warehousing	15,395	14,137	14,122	16,446	19,038
9	Provision of Accommodation and Food and Beverages	7,351	6,620	6,544	7,454	8,604
10	Information and Communication	12,443	13,605	14,537	16,344	18,321
11	Financial Services and Insurance	14,668	14,548	15,529	16,856	17,661
12	Real Estate	21,460	23,033	23,714	25,330	26,263
13	Corporate Services	6,463	6,722	6,987	8,107	8,983
14	Government Administration, Defense and Compulsory Social Security	4,380	4,672	4,761	4,736	4,606
15	Education services	6,150	6,263	6,469	6,753	7,351
16	Health Services and Social Activities	4,120	4,222	4,254	4,599	5,081
17	Other Services	2,830	2,882	2,922	3,314	3,875
	TOTAL	241,482	242,199	254,722	280,159	303,312

Source : Central Statistics Agency city field , 2024

While the product data Gross Regional Domestic Product (GRDP) of North Sumatra Province Based on Current Prices 2010 According to Field business (Billion Rupiah) for the 2019-2023 period , is as following :

Table 2. GRDP of North Sumatra Province Based on Current Prices According to Business Field (Billion Rupiah)

No	Sector	2019	2020	2021	2022	2023
1	Agriculture, Forestry and Fisheries	164153	173,075	189,491	219,499	247,961
2	Mining and Quarrying	10.161	10,373	10,710	11,585	12,281
3	Processing industry	152,247	156,504	167,949	182,726	193,774
4	Electricity and Gas Procurement	908	932	987	1,061	1,098
5	Water Supply, Waste Management, Waste and Recycling	797	831	871	898	935
6	Construction	113,765	11,046	115,754	126,420	138,759
7	Wholesale and Retail Trade; Automobile and Motorcycle Repair	150,489	153,226	162,579	181,402	200,527
8	Transportation and Warehousing	40,567	36,409	35,870	43,380	53,094
9	Provision of Accommodation and Food and Beverages	19,379	17,692	17,663	19,482	22,156
10	Information and Communication	17,140	18,467	20,094	22,222	24,162
11	Financial Services and Insurance	23,344	23,530	25,545	28,386	30,279
12	Real Estate	40,943	42,705	43,913	46,639	48,952
13	Corporate Services	8,667	8,692	8,848	10,073	11,128
14	Government Administration, Defense and Compulsory Social Security	29,462	30,147	30,458	30,243	31,526
15	Educational Services	14,768	15,490	16,017	16,879	18,415
16	Health Services and Social Activities	8.155	8,374	8,499	9,041	9,870

17	Other Services	4.666	4,594	4.686	5.285	6,079	
	TOTAL	635,456	701,042	744,180	735,721	1,002,044	

Source : Central Statistics Agency North Sumatra Province , 2024

GDP reflects the total economic output of a region and shows the contribution of each sector to the economy as a whole. By mapping the PBB of business sectors, local governments and stakeholders can determine which sectors are the main drivers of the economy and which sectors have the potential for further development. Key sectors can be identified through indicators such as growth rate, contribution to GDP, and also the competitiveness of this sector in regional and national markets (Kuncoro, 2019). In recent years, Medan City has experienced rapid economic development, especially in the trade, manufacturing, and transportation service sectors. However, after this growth, there are challenges that must be overcome, especially the gap between sectors and the level of dependence on certain sectors (Fauzan & Supriyadi, 2020).

This requires further analysis to understand the dynamics between sectors and the economic potential of Medan City . can be maximized. Identify the main sectors of Medan City using GDP analysis based on business areas. Given that these sectors have competitive advantages and significant contributions, it is hoped that recommendations can be produced that are useful for formulating more effective regional development policies. Policies based on this analysis are expected not only to improve the economic welfare of the community, but also to encourage stable development and increase the competitiveness of the Medan City economy at the national and international levels (Rahman, 2022).

However, there are several major problems in this study that need to be explained. First, the economic sector gap is one of the most prominent content factors. Although the trade and manufacturing sectors are highly developed, other sectors may not receive the same attention, which can result in inequality in income distribution and employment opportunities. This gap also causes social welfare which can hamper economic growth in the long term. Dependence on these sectors can put the Medan City economy at the mercy of the market and economic crisis. This damage will hamper the economy of Medan City and hamper investment and sustainable economic growth. Therefore, it is very important to reduce problems and increase the resilience of the regional economy. The next factor that is my reason is that it is not evenly distributed between the sectors of each region which makes it a challenge.

There are some sectors that have competitive advantages, while other regional sectors may experience problems with limitations in infrastructure, human resources and technology. This can cause major losses in obtaining economic opportunities and hinder the growth of economic sectors that are not yet developing rapidly. Apart from that, limited access to accurate data on champions is one of the factors in this research which is an obstacle in facing the economic dynamics of the city of Medan. Without capable data, it is difficult to fully understand the existing challenges, which can hamper the proven decision process. In this way, this can provide an understanding of the main sectors based on GRDP analysis which is expected to provide policies that improve the economy of the Medan City Region.

Hypothesis Development

This study aims to identify the leading sectors in Medan City using the Location method. Quotient (LQ) and Shift-Share Analysis (SSA). In this analysis, researchers explore sectors that have competitive advantages and evaluate economic growth from 2019 to 2023. The LQ method is used to distinguish between basic and non-basic sectors, while SSA serves to analyze the competitiveness and growth of sectors in the area compared to the province of North Sumatra.

1. The Influence of Trade on Economic Growth in Medan City

H0: During the 2019-2023 period, the trade sector does not have a significant influence on the economic growth of Medan City.

H1: During the 2019-2023 period, the trade sector has a significant influence on the economic growth of Medan City.

2. Dependence on manufacturing industry

H0: Dependence on the manufacturing industry does not have a significant impact on the economic stability of Medan City during the 2019-2023 period.

H1: Dependence on the manufacturing industry has a significant impact on the economic stability of Medan City during the 2019-2023 period.

3. Competitive Advantages of Medan City Transportation

H0: During the 2019-2023 period, the Medan City transportation sector does not have a significant advantage compared to other areas in North Sumatra.

H1: The transportation sector of Medan City has significant advantages compared to other areas in North Sumatra.

Method

This study uses a quantitative approach which is a research method that tests supporting data to find data in the form of numbers. This approach aims to analyze the leading sectors of the region in Medan, North Sumatra Province. The sample used in this study is data (GRDP) Gross Domestic Product by Determining GRDP based on the Medan business sector, North Sumatra Province in the period 2019-2023. The type of data in this study is secondary data, namely research that uses existing data, namely data from the Central Statistics Agency (BPS).

The data will be processed using LQ (Location Quotient) aims to determine the calculation method and comparison level of the region's leading sectors. Location Quotient (LQ) is an analytical tool used to measure the number of economic sectors in a region compared to the number of the same sectors at a larger level, such as a province or national level. LQ can be calculated by comparing the share of a particular sector's contribution to the region's overall GRDP and the share of that sector's contribution to the national GDP as a whole. This study also uses Shift-Share analysis . Shift-Share analysis is an analytical technique used to divide a region's economic growth into three components: the influence of national growth, the influence of industrial structure, and the influence of local advantages. " Shift-Share Analysis is an effective tool for analyzing economic growth in a region by separating the influence of external and local factors, which can help in formulating more appropriate development policies that are in accordance with the characteristics of the regional economy." (Susanto & Haryanto, 2020). Shift-Share Analysis can provide in-depth insight into the dynamics of economic sector growth in a region, separating the influence of national growth and local advantages, so that it is useful in formulating development strategies. This analysis helps determine the strengths and weaknesses of the local economy and provides useful information for policy formulation.

The population in this study is all economic sectors that contribute to the GRDP in the city of Medan in the period 2019-2023. The population includes GRDP data for the city of Medan such as trade, development, transportation, agriculture and services and other sectors. The data collection technique in this study uses documentation techniques, namely this study is secondary data that already exists. The tool used in this study is Shift-Share which aims to determine the performance of the leading sectors in Medan. Data is taken from the Central Statistics Agency (BPS). The data collected will be analyzed to see the GRDP data for the Medan period 2019-2023.

Results and Discussion

Location Quotient (LQ)

Location Quotient (LQ) is an effective method for evaluating the competitive advantage of a sector in a region compared to the national average, so that it can help decision making in regional economic planning." (Ramadhan & Sari, 2023). If the LQ value is more than 1, the sector is considered superior and has a greater

concentration in the area compared to the national average. Conversely, if the LQ value is less than 1, the sector is considered under-analyzed. In the study Here , secondary data is used which consists of from Product Gross Regional Domestic Product (GRDP) of Medan City, based on price applicable 2010 according to Business Field , for period 2019 to 2023. In addition , the GRDP data for North Sumatra Province was also used with base same price For the same year . From the analysis against secondary data this , looks that the total GRDP of the Regency Labuhan Batu is far away more small compared to with the total GRDP of the Province .

It is stated with the formula below this (Amalina, 2024):

$$LQ = (v_i / v_t) / (V_i / V_t)$$

Information :

v_i = Value of GRDP sector Regency Stone Lab

v_t = Total GRDP of the Regency Stone Lab

V_i = Value of GRDP sector North Sumatra Province

V_t = Total GRDP of North Sumatra Province

Table 3. Location Quotient (LQ)

No	Sector	LQ-2019	LQ-2020	LQ-2021	LQ-2022	LQ-2023	AVERAGE	KETER WISH
1	Agriculture, Forestry and Fisheries	0.04	0.05	0.038589171	0.03201263	0.037552646	0.04	Note:
2	Mining and Quarrying	0.00	0.00	0.000681955	0.00060751	0.00077473	0.00	Note:
3	Processing industry	0.59	0.63	0.63029452	0.57055748	0.727649433	0.63	Note:
4	Electricity and Gas Procurement	0.64	0.72	0.738675282	0.65607524	0.842433407	0.72	Note:
5	Water Supply, Waste Management, Waste and Recycling	1.51	1.70	1.703843883	1.54602634	1.965417909	1.69	B
6	Construction	1.08	11.95	1.239238746	1,11144373	1.342928665	3.35	B
7	Wholesale and Retail Trade; Car and Motorcycle Repair	1.08	1.18	1,19118193	1.06463656	1.330973116	1.17	B
8	Transportation and Warehousing	1.00	1.12	1,150180551	0.99559804	1.18459968	1.09	B
9	Provision of Accommodation and Food and Beverages	1.00	1.08	1.082425159	1.0048468	1.282961922	1.09	B
10	Information and Communication	1.91	2.13	2.113626992	1.93147528	2.505063332	2.12	B
11	Financial Services and Insurance	1.65	1.79	1.776068756	1.55942999	1.92693386	1.74	B
12	Real Estate	1.38	1.56	1.57767729	1.42624057	1.77239656	1.54	B
13	Corporate Services	1.96	2.24	2.307082818	2.11362843	2.66679392	2.26	B
14	Government Administration,	0.39	0.45	0.456700589	0.41123	0.482638494	0.44	Note:

	Defense and Compulsory Social Security							
15	Educational Services	1.10	1.17	1,179866148	1.05062326	1.318699288	1.16	B
16	Health Services and Social Activities	1.33	1.46	1.462279174	1.33583136	1.700866763	1.46	B
17	Other Services	1.60	1.82	1.821622482	1.64684059	2,106043121	1.80	B
	Total Gross Regional Domestic Product	1.00	1.00	1	1	1	1.00	

Source : data processed by researchers , 2024

Description : B: Basic sector and NB: Non-Basic sector

From the results calculation LQ analysis in table on seen that average results of LQ values in Medan City in 2019-2023 period , there are 12 superior sub - sectors (base). The sub-sectors the is (1) Water Procurement , Management Garbage , Waste and Recycling , (2) Construction , (3) Wholesale and Retail Trade , Car and Motorcycle Repair , (4) Transportation and Warehousing , (5) Provision Accommodation and Food and Beverage , (6) Information and Communication , (7) Financial Services and Insurance , (8) Real Estate, (9) Corporate Services, (10) Educational Services, (11) Health Services and Social Activities , (12) Other Services . Sectors the classified as become sector flagship (base) with results LQ calculation > 1. So sector the is sectors that are capable fulfil request its area and can export results production in the area others .

Shift Share (SS) Analysis

Shift-Share Analysis is an analytical technique used to divide a region's economic growth into three components: the influence of national growth, the influence of industrial structure, and the influence of local advantages. " Shift-Share Analysis is an effective tool for analyzing economic growth in a region by separating the influence of external and local factors, which can help in formulating more appropriate development policies that are in accordance with the characteristics of the regional economy." (Susanto & Haryanto, 2020). Shift-Share Analysis can provide in-depth insight into the dynamics of economic sector growth in a region, separating the influence of national growth and local advantages, so that it is useful in formulating development strategies. This analysis helps determine the strengths and weaknesses of the local economy and provides useful information for policy formulation.

Table 4. Shift Share (SS) Analysis

No	Sector	national share	proportional share	differential share	projection
1	Agriculture, Forestry and Fisheries	0.046958925	-0.529929594	-0.46359335	-0.946564
2	Mining and Quarrying	-0.998930219	0.001069781	-0.073745658	-1.071606
3	Processing industry	14.8534363	15.8534363	14.67298553	45.37986
4	Electricity and Gas Procurement	-0.896023238	0.103976762	0.097289515	-0.694757
5	Water Supply, Waste Management, Waste and Recycling	-0.793331699	0.206668301	0.200971047	-0.385692
6	Construction	19.95167042	20.95167042	20.10636749	61,00971
7	Wholesale and Retail Trade; Car and Motorcycle Repair	29.00869568	30.00869568	28.78710841	87,8045
8	Transportation and Warehousing	6.071675321	7.071675321	6.748232613	19.89158

9	Provision of Accommodation and Food and Beverages	2.195992779	3.195992779	3.061022332	8.453008
10	Information and Communication	5.805426167	6.805426167	6.658234481	19.26909
11	Financial Services and Insurance	5.560193749	6.560193749	6.375736163	18.49612
12	Real Estate	8.755265328	9.755265328	9.45705351	27.96758
13	Corporate Services	2.336676399	3.336676399	3.268885515	8.942238
14	Government Administration, Defense and Compulsory Social Security	0.710783986	1.710783986	1.518731523	3.940299
15	Educational Services	1.730381778	2.730381778	2.618199497	7,078963
16	Health Services and Social Activities	0.887453847	1.887453847	1.827329177	4.602237
17	Other Services	0.43938651	1.43938651	1.402356244	3.281129
	Gross Regional Domestic Product	111.6657158	112.6657158	106.5613796	330,8928

From Table 4 through results Calculation of National share, Proportional share, and Differential share of Medan City during the period time 2019 - 2023 is visible that there is four twelve sector a worthwhile endeavor positive . On the National share which has mark the biggest is Industry Processing , Industrial sector processing in Medan City provides influence positive in various aspects . First , the sector This create field significant work , helping reduce number unemployment and increase income society . Second , industry processing contribute to growth economy local through improvement mark plus products , which has an impact on increasing the city's GRDP . In addition , the sector this also encourages development infrastructure and connectivity , such as transportation and provision energy . Lastly , the existence of industry processing can increase Power competition area , interesting investment , and strengthen Medan's position as center trade and industry in Sumatra.

As for the Proportional Share results , it can be seen that own One sector mark negative that is sector Agriculture , Forestry and Fisheries . This suggests that the city of Medan provides contribution to the same sector with grow fast on the economy in the Province . At the value Differential shares that have mark highest in growth is sector business Wholesale and Retail Trade ; Car and Motorcycle Tire Repair . Differential shift which has mark calculation positive (+) shows sector own level more growth fast than growth the same sector in other regions or stated as sectors that have profit locational whereas If mark calculation negative (-) shows sector own level more growth slow in the same sector in the area others . Projected values in each sector business can seen the results are in the table . The business sector that has mark project the biggest found in four sector business namely : Industry Processing ; Construction ; Wholesale and Retail Trade .

Previous research conducted by Loren Surmila Br Surbakti, Marseto, and Sishadiyati in the Jambura Economic Education Journal, 2021 identified sectors such as trade, industry and services as the main drivers of economic growth in Medan City, research conducted by Abdul Aziz Ahmad in Analysis of Leading Sectors and Regional Economic Potential of Districts/Cities in Central Java Province using the Location Quotient and Shift Share Method also identified the processing industry, wholesale trade and construction as the main drivers of the regional economy. These two studies are in line with the research results that we found that the leading sector (base) is the Manufacturing Industry; Construction ; Wholesale and Retail Trade.

Conclusion

Study This succeed identify sectors the flagship that became booster main the economy of Medan City. With use Location Quotient (LQ) method , found that a number of sector The mainstays in Medan include water supply , water management waste , construction , trade wholesale and retail , transportation , and service finance . Sectors the own LQ value is higher from 1, which indicates that they contribute more big compared to with the same sector on a scale national.In addition That is , Shift-Share analysis (SSA) shows that sector industry processing , construction , and trading wholesale and retail show growth significant economy in

Medan City. The sectors This No only own more growth fast compared to the same sector in other areas , but also has superiority local that can utilized more carry on For strengthen economy city . Analysis This show that sectors the own role important in create field work , improve mark plus economy , and encourage investment . Recommendation from study This is government Medan City area should be focus on development sectors Featured the For increase Power competition economy at the level national and also international . Policy results - based development this LQ and SSA analysis will give impact positive for stability and growth economy term long in Medan City. Strengthening sectors this is also expected can increase welfare public local as well as strengthen Medan's position as center economy in the western region of Indonesia. In general overall , research This highlight importance mapping sectors Featured in formulate a more comprehensive development strategy appropriate target . The result of analysis This also provides information important that can used by stakeholders interest in direct source power and policy For maximize potential Medan City economy .

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