ANALYSIS OF LEADING SECTORS IN WEST SUMATRA PROVINCE

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ABSTRACT

This study analyzes the leading economic sectors in West Sumatra Province from 2017-2022 using location quotient, dynamic location quotient, and shift-share analyses. The objective is identifying current areas of comparative advantage and emerging prospects to guide export development. The results reveal wholesale/retail trade as an established regional strength with high economic concentration and competitiveness. Transportation also has high concentration but shows declining competitiveness recently. Emerging potential sectors include mining, electricity and gas. Other established economic bases include manufacturing, finance, real estate, education, health, information/communications and public administration. The findings align with previous research and provide quantitative evidence of priority export-oriented industries. Further investigation into drivers and opportunities in these sectors can help translate them into superior regional export products. Overall, the analyses identify wholesale/retail, transportation, mining, finance, real estate, education, health, and information/communications services as current and emerging leading sectors and economic bases in West Sumatra.

1.   INTRODUCTION

1.1. Background

Economists often use indicators to explain the economic conditions in a country or region. One of the indicators used by economists is gross domestic product (GDP). According to Mr. Mankiw, National Income or GDP can be defined in two views, first we can see GDP as the total income of all people in an economy, another way is to view GDP as the total expenditure on the output of goods and services in an economy (Mankiw, 2016). Todaro sees GDP as the second view, which is the total final output of goods and services produced by a country's economy, within the country's territory, by residents and non-residents, regardless of allocation whether domestic or foreign claims (M. P. Todaro & Smith, 2011).

The output value that will be used in calculating GDP can be distinguished into two types, the value calculated at current prices and the value at a base year price. Gregory Mankiw explains that the GDP value calculated using current prices is known as Nominal GDP. The GDP value calculated using prices in a year as a base is called Real GDP. These are the terms economists use to approach economic conditions (Mankiw, 2016).

GDP on a smaller scale is known as gross regional domestic product (GRDP). This smaller scale can include provincial regions or a district/city. In calculating GRDP, Indonesia Statistics (BPS) will calculate all economic activities in the region, whether carried out by natives or residents or migrants or non-residents (BPS, 2023).

Another use of GDP or GRDP is that it can illustrate the potential for taxation of the region. In general, the higher the income of a country or region, the greater the tax ratio or tax revenue, this opinion is supported by research results from Besley & Persson

In order to find out which sectors have the potential to increase regional original income, an analysis of the GRDP of an area is needed. According to Gomez & Stair (2017), an analytical method that can describe the specific potential of a region is the use of the LQ method. In addition to describing the potential of a region, the LQ method can also illustrate the sector that is most exported and which sectors have the potential to increase or even reduce the economy of an area when exported.

The results of Irza (2021) research state that in 2020, West Sumatra has a superior economic sector in the form of the wholesale and retail trade and repair of motor vehicles and motorcycles sector. Irza (2021) used the LQ method, shift-share method, and klassen typology method in his analysis of West Sumatra. The results of this study are in line with reports submitted by the Regional Office of the Directorate General of Taxes for West Sumatra and Jambi which state that the highest revenue in West Sumatra region is non-oil and gas income tax, and more specifically in the wholesale and retail trade sector and repair of motor vehicles and motorcycles, government administration and compulsory social security sector and financial services and insurance sector. These three sectors contributed as much as 57.41 percent of tax revenue in the West Sumatra and Jambi DGT Regional Office in 2021 (Efison, 2021).

Data from BPS as in Figure 1 in 2022 shows that West Sumatra has a GRDP of Rp182,629,542 million. When viewed through descriptive observations, it can be seen that the agriculture, forestry and fisheries sector have the largest contribution to the GRDP of West Sumatra Province with a value of Rp40,189,080 million or equivalent to 22 percent of GRDP, while the second largest contributor is the wholesale and retail trade sector, repair of motor vehicles and motorcycles with a value of Rp30,577,856 million or equivalent to 17 percent of GRDP.
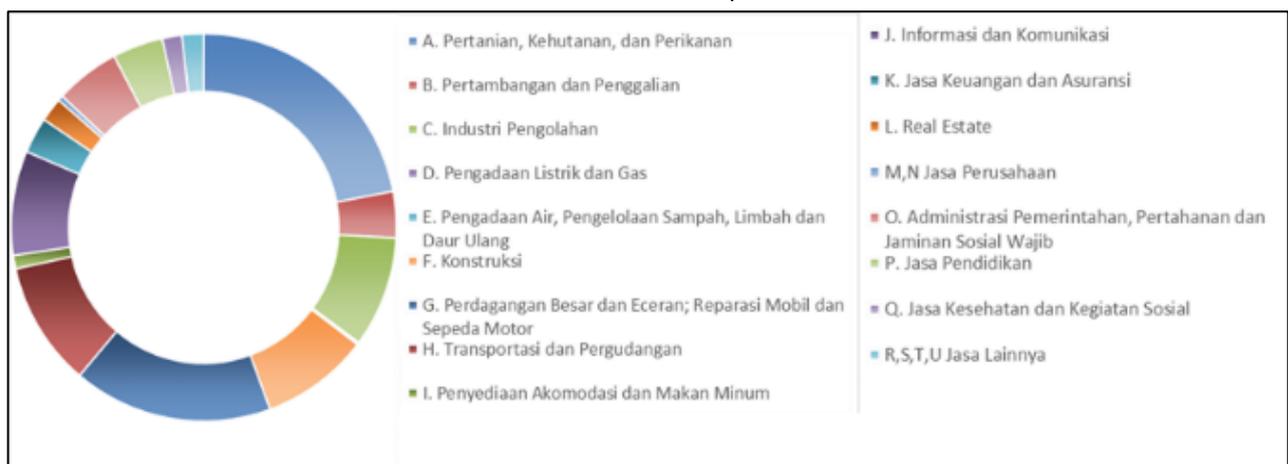

(2014); Castro & Camarillo (2014), McNabb (2018) and, Langford et al. (2016). Thus, this should be a concern for regional governments in order to improve the regional economy which in turn will increase regional original income of provinces or districts/cities. One of the methods used to get an overview of the economic situation from GRDP is by using the location quotient (LQ) method.

Figure 1. GRDP of West Sumatera
Source: (BPS, 2023)

Based on the above, the author tries to analyze the leading sectors in West Sumatra Province using the LQ analysis method, dynamic location quotient (DLQ) analysis and, shift-share analysis method in the period 2019 to 2022. For conducting the analysis, in this descriptive statistical research, the author expects a view of sectors that have the potential to be

explored in order to add insight for policy makers in determining which sectors need special attention to be developed in West Sumatera so that it can have its own superior product that can describes the region of West Sumatera.

2. THEORETICAL FRAMEWORK

2.1. Trade Balance

The balance of trade is the volume of a country's inbound and outbound trade in goods and services when using an export and import perspective. As explained in GDP, the balance of trade is denoted by NX in the GDP formulation. So, we can reformulate the GDP formula as follows:

$$NX = Y - (C + I + G)$$

Net Exports = Output – Domestic Spending

Whereas Y represents the total output or GDP in the economy. It represents the total value of all final goods and services produced. C represents total private consumption spending by households on goods and services in the economy. I represent gross private domestic investment spending on capital goods by businesses. G represents total government spending on goods, services and investment. Finally, NX stands for net exports, which is the value of a country's total exports minus total imports. Basically, the formula can be summarized as Net Exports = Output – Domestic Spending (Mankiw, 2016).

So, if GDP exceeds domestic expenditure, then it can be assumed that NX is positive, but if GDP is smaller than domestic expenditure, then the value of NX is negative. The effect of these positive and negative values is explained by Mankiw as follows (Mankiw, 2016):

- When NX is positive, then (exports > imports), the country has a trade surplus, which can make the country a creditor of the world's financial markets;
- When NX is negative, then (exports < imports), the country has a deficit trade balance. This impacts the country's position in the world financial market as a debtor;
- If NX is 0, then (exports = imports), the country is in trade balance.

2.2. Economic Base Theory (EBT)

EBT is a traditional body of thought in economy, especially in regional economy development. EBT divided local regional economies into two parts, that is non-basic sector and basic sector (Stimson et al., 2006). These models of regional economic development formulated in the 1940s and 1950s by economists such as Douglass North, John Wesley Alexander, Charles Tiebout (Alexander, 1954; Isserman, 1980; Tiebout, 1956).

- **Non-Basic/Local Sector**: This sector produces goods and services for local consumption within the region. (Stimson et al., 2006).
- **Basic/Export Sector**: This sector produces goods and services that are exported outside the region, bringing in money (Stimson et al., 2006).

The economic base theory posits that the export-oriented basic sector is the main driver of economic growth in a region, as it brings in external money that then circulates locally to support jobs and incomes in the non-basic sector (Isserman, 1980; Tiebout, 1956). Growth depends on expanding exports and the size of the economic base. The theory was often used to model urban and regional economies in the post-war period, and to develop local economic development policy focused on business attraction and export promotion (Leigh & Blakely, 2013).

2.3. Competitive Theory

Competitive advantage theory seeks to explain how regions and cities gain an economic edge over others by developing uniquely valuable skills, resources, and positions in key industries (Udriyah et al., 2019). According to competitive advantage theory, regions compete for mobile factors like investment capital, entrepreneurship, and skilled labor. A region can develop competitive advantage in an industry in two main ways, through a comparative advantage or a created advantage (StÄƒnculescu, 2015).

Comparative advantage is when a region has unusual factor endowments like access to natural resources, labor skills, technology, infrastructure etc. that provide lower costs or differentiation in an industry (Chor, 2010). Regions typically develop exports in industries that intensively use their abundant factor(s). While the created advantage is when a region invests in specialized assets like a skilled workforce, research labs, supplier networks, knowledge spillovers, and other strategic resources that provide uniqueness (Chor, 2010). Regions proactively build advantages in priority sectors.

Sources of regional competitive advantage range from innate potential to intentional development of industry ecosystems (Porter, 1998). These advantages allow firms in a region to produce more value and gain market share. Competitive advantage theory suggests regional economic development policy should analyze local factor conditions and strategically invest to grow specialized, high-productivity industry clusters. Sustained competitive advantage is difficult to replicate and can drive exports, wages, innovation and long-run growth.

2.4. Literature Review

If someone has a skeptical mindset, then they will consider the theory of the benefits of economic openness, the theory of superior products, and the theory of comparative advantage of a region as just a theory. These theories are considered inapplicable in the real world. The following are the results of previous studies that put forward facts in the field regarding these theories.

Trade openness in West Sumatra was analyzed by Malinda (2016), and found that many private sector parties have not managed to take advantage of opportunities for superior products in West Sumatra

and instead lost out to other competitors who can export at a relatively lower cost but produce superior products. Malinda's suggestion is to conduct research on superior products in order to make the best use of these opportunities.

Another example of failure to utilize superior products in Indonesia can be seen from the results of research by Nur et al. (2021) which analyzes how the competitiveness of South Sumatra's natural rubber production in international trade. Based on empirical evidence from this study, it is found that the South Sumatra region still needs to make improvements in increasing the production of quality natural rubber so that it can export its superior quality and can compete against products from competitors in terms of sales and product quality.

Not always a loss, based on research from Zahir (2017), regarding the competitiveness of Indonesian Cashew Nut Production in the international market shows that Indonesia has a superior cashew nut product and has begun to be able to take advantage of these opportunities by exporting cashew nuts. Although, it has been utilized, there is still room to maximize product excellence by providing assistance in the form of knowledge and capital to the private sector producing these superior products. This is expected to increase the production of superior products.

The research on efforts to recognize the local government itself has been carried out previously by Ramadhan & Saepudin (2023) who conducted research using the Shift-Share method, and Klassen typology in West Sumatera Province in 2010 to 2019. The results of the research Ramadhan & Saepudin (2023) and further research until 2020 with the selection of the same methods were conducted by Irza (2021). Irza used the three methods to determine whether the sector of excellence in West Sumatra Province in 2020. The results of this study are the leading sectors of West Sumatra, namely the Wholesale and Retail Trade & Car and Motorcycle Repair Sector, the Education Services Sector, then the Transportation and Warehousing Sector, the Government Administration, Defense, and Compulsory Social Security Sector, and the Health Services and Social Activities Sector.

The latest research on the analysis of excellence in the capital region of West Sumatra Province, namely Padang City, was conducted by Rosa & Yendra (2023), but only used the LQ method without using the two methods used by previous researchers. Rosa and Yendra researched using GRDP data from 2017 to 2021. The result of Rosa and Yendra's research is that the leading sector of Padang City is the Corporate Services Sector with a weighted value of 3.30. Furthermore, Rosa and Yendra offered suggestions to the Padang City government to routinely compile site plans and regional patterns for the leading sectors of the regional economy.

3. METHODS

3.1. Data Selection

The data used in this study are secondary data derived from the Indonesian Statistics regarding the Gross Regional Domestic Product of the West Sumatra region and the Indonesian Gross Domestic Product. The GRDP and GDP used have a time span from 2017 to 2022. The selection of the city of West Sumatra as the locus of this research is based on the fact that in the West Sumatra region there is still no superior product that describes the region in export trade, whether it means exports to other provinces or even broadly exports to other countries (Nur et al., 2021).

The GDP and GDRP that are used can be seen on Table 1. The GRDP data is obtained specifically for West Sumatra Province, representing the total value of final goods and services produced within the region each year across 17 economic sectors categorized based on the Indonesian Standard Industrial Classification (Klasifikasi Baku Lapangan Usaha Indonesia). The GDP data reflects the same 17 aggregated industry categories at the national level for comparative benchmarking.

West Sumatra Province is selected as the focus of analysis due to the lack of definitive superior export products that currently describe the region based on previous academic studies, representing an opportunity for further investigation. The 6-year time period from 2017-2022 provides an adequate timeframe to discern economic trends and changes in industry concentration utilizing location quotient and shift-share analysis techniques (Nazara & Hewings, 2004). While very long intervals risk missing more recent structural changes. It depends on your specific goals and needs for the analysis (Dinc & Haynes, 1999). Checking multiple intervals can provide a more complete understanding of changes over time.

The name of each sector that is listed on Table 1 will be used in the analysis and will only be called by its initial, such as sector A. Agriculture, forestry and fishing will be called Sector A, and the rest of the sector will be used in such manner.

Table 1. 17 Sector of GDP and GDRP

Code	GDP and GDRP Share of Indonesia by Sector
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity and gas
E	Water, sewage and waste management
F	Construction
G	Wholesale and retail trade, repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M, N	Business activities

O	Public administration and defense, compulsory social security
P	Education
Q	Human health and social work activities
R, S, T, U	Other services activities

This level of industry detail allows for insightful economic analysis of the 17 sectors that make up the GRDP and GDP totals using the defined quantitative methods. The data provides the necessary regional and national industry information to conduct location quotient, dynamic location quotient, and shift-share analyses.

3.2. Location Quotient Analysis

The usual analysis by economists of a region's GDP in order to determine how superior a region's products are is to use the Location Quotient method. This method gives a number to a sector in the economy on how a region contributes to a sector in the larger economy (Lightcast, 2015). So, with the LQ method one can find out about the unique sector in a region compared to the same sector on a national scale. Suppose the LQ number in the national Corporate Services sector is 1% and region X is 2.5%, then this means that the Corporate Services sector is 2.5 times more in region X than other regions in general (Lightcast, 2015). The LQ calculation formula is as follows (Wheeler, 2004):

$$LQ = \frac{X_{Sumbar} \, / \, \Sigma X_{Sumbar}}{N_{Nasional} \, / \, \Sigma N_{Nasional}} \times 100$$

Where:
LQ : Coefficient of location quotient calculation
X_{Sumbar} : The value of the variable (GRDP Sector) in West Sumatra region
ΣX_{Sumbar} : The total value of GRDP in West Sumatra
$N_{Nasional}$: Values of variables (GDP Sector) in Indonesia
$\Sigma N_{Nasional}$: Total value of Indonesian GDP

The interpretation formula of the results of the LQ calculation will be as follows:

- LQ > 1, this indicates that the sector has the capability to export its output at the national level (basis sector).;
- LQ < 1, this indicates that the sector needs to import to fulfill its regional needs for the sector (non-base sector);
- LQ = 1, this indicates that there is a balance of productivity between regional and national in the production of a sector.

3.3. Dynamic Location Quotient Analysis

In addition to the classic LQ theory, there is also a development of this analysis known as Dynamic Location Quotient (DLQ). DLQ is useful when analyzing LQ in data that has time series (Hidayat & Supriharjo, 2014). With DLQ analysis, the results will be obtained in the form of sectors that have the potential to become basic or leading sectors. The DLQ calculation formula is as follows:

$$DLQ = \left[\frac{(1 + \Delta G_X)/ (1 + \Delta \Sigma G_X)}{(1 + \Delta G_N)/ (1 + \Delta \Sigma G_N)}\right]^t$$

Where:
DLQ : coefficient of dynamic location quotient calculation
ΔG_X : the value of the average growth of the variable (GRDP sector) in West Sumatra
$\Delta \Sigma G_X$: the total average value of GRDP growth in West Sumatra
ΔG_N : the value of the average growth of the variable (GDP sector) in Indonesia
$\Delta \Sigma G_N$: Average total value of Indonesia's GDP growth
t : Difference between year-end and year-start

The interpretation of the results of the DLQ calculation will be as follows:

- DLQ > 1, this indicates that the sector has the potential to export its sector output at the national level (prospective sector);
- DLQ < 1, this indicates that the sector has the potential to import to fulfill its regional needs for the sector (non-prospective sector);
- LQ = 1, this indicates that there is a balance of potential productivity between the region and the national level in the production of a sector (no development sector).

3.4. Shift-Share Analysis

Shift-share analysis is a quantitative technique developed in the field of regional economics in the 1960s to understand the sources of economic growth and structural change within a regional economy by comparing it to a larger national or regional benchmark economy (Trubnik & Mazurenko, 2019).

The technique separates employment growth in a regional industry into three components. The first one is 1) national growth effect or proportional growth talks about regional industry growth attributed to overall growth trends in the national economy. If a regional industry is growing at the same rate as the national economy, this effect would account for all of its growth. 2) industrial mix effect or net shift talks about growth attributed to the specific industry's differential growth rate at the national level. Accounts for regional industry growing faster or slower than overall national growth due to national-level trends in that industry. Lastly, 3) regional competitiveness effect or competitive effect is a unique growth in the regional industry after removing the national and industrial mix effects. Attributed to regional competitive advantages or disadvantages such as productivity, costs, resources, clusters, or policy (Jackson & Haynes, 2009).

By decomposing growth into these three effects, shift-share analysis reveals the impact of broader national conditions versus unique regional industrial structures and competitiveness in driving economic shifts (Khusaini, M., 2015). This can guide policymakers in identifying targeted high-growth industries where a region has a competitive edge. Limitations of shift-share analysis include its inability to specify particular factors causing regional competitiveness. However, it remains an important first step in analyzing evolving regional economic structures (Khusaini, 2015). The formulation of the Shift-share analysis that divided into three components which is national share (NS), industry mix (IM), and regional shift (RS) is as follows (Stimson et al., 2006):

$$\Delta e_i \equiv e_{i,t} - e_{i,t-1} \equiv NS_i + IM_i + RS_i$$

Where ei and Ei the regional and national income, respectively, in industry i. e and E represent regional and national GDP, respectively. Lastly t-1 is the start period and t is the end period of the analysis. This main formula can be divided to represent each component of shift-share analysis, the first component is the national share of an economy (NS), the formula is as follows:

$$NS_i \equiv e_{i,t-1}\left(\frac{E_t}{E_{t-1} - 1}\right)$$

$$IM_i \equiv e_{i,t-1}\left(\frac{\frac{E_{i,t}}{E_{i,t-1} - E_t}}{E_{t-1}}\right)$$

$$RS_i \equiv e_{i,t-1}\left(\frac{\frac{e_{i,t}}{e_{i,t-1} - E_{i,t}}}{E_{i,t-1}}\right)$$

$$e_{i,t} \equiv e_{i,t-1} + (NS_i + IM_i + RS_i)$$

This classic shift-share model - used extensively by economists, geographers, and economists, geographers, regional scientists, and planners in regional analysis - thus emphasizes not only the role of regional change for a region-specific industry, but also the regional industry, but also the regional shift or competitive component as a measure of the region's relative.

Relative performance of the region for a particular industry. A position shift is interpreted as being related to the comparative or competitive advantage of the region for that of the region for that industry, or vice versa.

4. RESULT

4.1. Location Quotient Analysis Result

A location quotient (LQ) analysis was conducted for various manufacturing industry sub-sectors in West Sumatera compared to Indonesia averages. The table shows the LQ values calculated for each manufacturing sector along with an indication of whether the LQ suggests that sector is part of the regional economic base (LQ > 1) or not (LQ < 1).

Table 2. LQ Analysis

Code	LQ 2017	2018	2019	2020	2021	ΔLQ	Note
A	0.214	0.215	0.215	0.216	0.214	0.215	Non-Basis
B	0.710	0.698	0.700	0.703	0.740	0.710	Non-Basis
C	1.430	1.399	1.372	1.363	1.323	1.377	Basis
D	1.021	1.003	0.980	0.973	1.828	1.161	Basis
E	1.609	1.683	1.605	1.673	1.653	1.645	Basis
F	1.108	1.090	1.067	1.047	1.033	1.069	Basis
G	1.101	1.071	1.053	1.046	1.053	1.065	Basis
H	1.414	1.431	1.471	1.564	1.566	1.489	Basis
I	1.013	0.988	0.979	0.921	0.920	0.964	Non-Basis
J	1.265	1.264	1.282	1.310	1.299	1.284	Basis
K	1.681	1.646	1.625	1.639	1.650	1.648	Basis
L	1.524	1.529	1.510	1.514	1.507	1.517	Basis
M, N	3.245	3.315	3.300	3.304	3.284	3.290	Basis
O	1.013	1.041	1.041	1.030	1.022	1.029	Basis
P	1.133	1.207	1.195	1.230	1.223	1.198	Basis
Q	1.057	1.133	1.128	1.154	1.148	1.124	Basis
R, S, T, U	1.189	1.304	1.323	1.331	1.326	1.295	Basis

The results reveal several manufacturing sectors that appear relatively concentrated in the region compared to the nation. Sectors C, D, E, F, G, H, J, K, L, MN, O, P, and RSTU all have location quotient values greater than 1, suggesting these industries likely compose the export-oriented manufacturing base of the region. The highest concentration is in sector MN with an LQ of 3.29, implying this industry has over 3 times the employment concentration in the region versus nationally. Meanwhile, sectors A, B, and I have LQs below 1, indicating they are not part of the regional economic base and primarily produce for local consumption.

In summary, the location quotient analysis points to 13 manufacturing sectors that are part of the region's export-oriented economic base and potential cluster strengths. Meanwhile three sectors appear to be underrepresented locally compared to national averages. These findings provide insights into the structure of the regional manufacturing industry and relative concentration of different sub-sectors. The implications will be discussed further in the following sections.

4.2. Dynamic Location Quotient Analysis Result

A dynamic location quotient (DLQ) analysis was conducted for various industry sectors in [specify region] to assess changes in regional industry concentration compared to national trends over time. The DLQ measures the change in a region's employment share for an industry relative to the change in the national employment share. A DLQ greater than 1 indicates the regional industry is becoming more concentrated over time compared to the nation.

Table 3. DLQ Analysis

Code	DLQ	Interpretation
A	0.848	non prospective
B	1.048	prospective
C	0.859	non prospective
D	1.195	prospective
E	0.967	non prospective
F	0.983	non prospective
G	0.933	non prospective
H	1.344	prospective
I	0.961	non prospective
J	0.965	non prospective
K	1.144	prospective
L	0.970	non prospective
M, N	0.977	non prospective
O	1.021	prospective
P	0.970	non prospective
Q	0.966	non prospective
R, S, T, U	0.965	non prospective

The results in the table identify several sectors that appear to be increasing their regional industry concentration over the time period analyzed based on DLQs greater than 1. These include sectors B, D, H, K, and O - which can be considered emerging prospects for the region. Meanwhile, sectors A, C, E, F, G, I, J, L, M,N, P, Q, and R,S,T,U all have DLQs less than 1, suggesting these industries are becoming less concentrated in the region compared to the nation over time.

In summary, the DLQ analysis reveals potential emerging regional industry clusters as well as declining clusters. The implications of these changing concentrations will be explored further in the following sections.
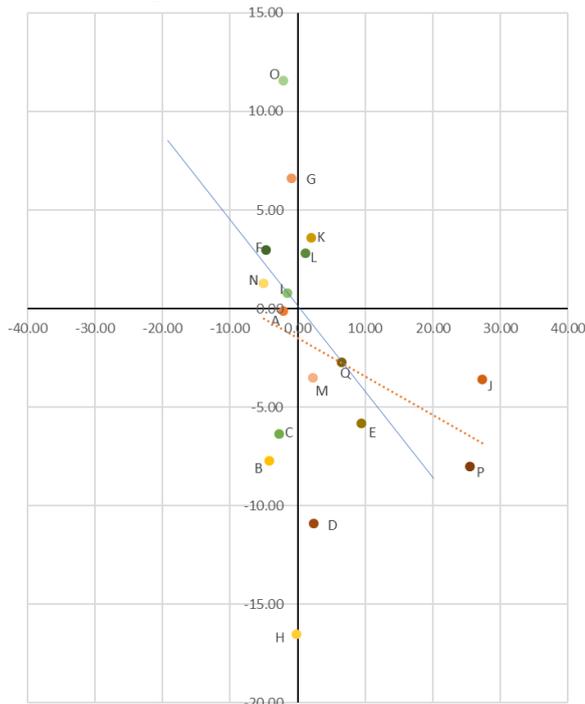
4.3. Shift-Share Analysis Result

Shift-share analysis is a quantitative technique in regional economics that separates regional industry employment growth into national growth effect, industrial mix effect, and regional competitiveness effect to reveal impact of national conditions versus unique regional industrial structures and competitiveness driving economic shifts; this guides policymakers in identifying high-growth industries where a region has competitive edge, though it cannot specify particular factors causing competitiveness.

Table 3. Shift-Share Analysis

Code	National Growth Effect (percentage)	Industrial Mix Effect (percentage)	Regional Competitiveness Effect (percentage)
A	-2.104776963	-2.254664673	-0.14988771
B	-4.203212555	-11.94222235	-7.739009799
C	-2.676355298	-9.065172896	-6.388817599
D	2.382771157	-8.556660501	-10.93943166
E	9.538547333	3.709191779	-5.829355554
F	-4.629594001	-1.673788433	2.955805568
G	-0.829631245	5.771124897	6.600756142
H	-0.10347233	-16.64570954	-16.54223721
I	-1.507923284	-0.755932958	0.751990326
J	27.33787257	23.70941291	-3.628459668
K	2.011465216	5.580075873	3.568610657
L	1.195417051	3.97995748	2.784540429
M, N	2.287488059	-1.254438298	-3.541926356
O	-5.024658788	-3.746040077	1.278618712
P	-2.107567764	9.42951196	11.53707972
Q	25.61477879	17.59836597	-8.01641282
R, S, T, U	6.596699879	3.853675859	-2.74302402

The result in Table 4 and Figure 2 shows the shift-share analysis of employment growth for various sectors in the regional economy compared to national growth. Looking at the regional competitiveness effect, the standouts are Sector G (Wholesale and retail trade) has a strong positive competitiveness effect of 6.6%. This implies it significantly outperformed its expected growth due to competitive regional advantages. Sector J (Information and communication) also had high competitiveness at 27%, though it declined by 3.6% indicating reducing competitiveness recently. Sector H (Transportation and storage) had a large negative effect of -16.5%, significantly underperforming likely due to regional disadvantages. Manufacturing, mining and electricity also underperformed national trends, while real estate overperformed. The industry mix effect shows sectors like education, health, finance and information benefiting from rapid national growth, while mining, manufacturing and transportation are in declining national industries.

Figure 2. GRDP of West Sumatera

Source: Author

Overall, the shift-share analysis reveals wholesale/retail, information, real estate and education as regional growth drivers, while mining, manufacturing and transportation are declining and in need of competitiveness improvement. The regional competitiveness effects highlight industries with strong or weak localized advantages that policy could target.

4.4. Discussion

The location quotient, dynamic location quotient, and shift-share analyses provide useful quantitative evidence for identifying current areas of comparative advantage and emerging prospective sectors in West Sumatra. Specifically, the results point to established concentration and competitiveness in sectors like wholesale/retail trade, transportation, finance, education, health, and information/communications services. Additionally, the dynamic location quotient analysis reveals potential developing strengths in mining, electricity and gas.

The current study's findings about leading sectors in West Sumatra aligns with the sectors identified in previous research. For example, the transportation sector was also found to be a leading sector in West Sumatra by Irza (2021), Ramadhan & Saepudin (2023), and Rosa (2019). This further confirms transportation as an established economic strength in the region.

Financial services were also identified as a leading sector by Irza (2021), consistent with the findings on finance and insurance in the current study. Government services were a common leading sector across Irza (2021), Ramadhan & Saepudin (2023), and the current study, highlighting the importance of the public administration industry. The identification of

agriculture, plantations, fisheries as economic bases by Rosa (2019) provides context on West Sumatra's natural resource assets. The current study builds on this by revealing rising competitiveness in related sectors like electricity and gas.

By combining statistical snapshot of the region's economic structure with in-depth investigation of local context, West Sumatra can translate the sectors with strong current activity and emerging potential into superior export products that capitalize on the region's specialized assets and capabilities. The LQ, DLQ and shift-share analyses provide empirical evidence to trace regional economic shifts, but must be partnered with on-the-ground research to dig into the specific factors driving competitiveness and growth opportunities in West Sumatra's priority sectors.

5. CONCLUSION

Based on the location quotient, dynamic location quotient, and shift-share analyses conducted in this study, some key conclusions can be drawn about the leading sectors and economic structure of West Sumatra are the wholesale/retail trade sector appears to be an established strength and economic base industry in West Sumatra based on its high location quotient and positive regional competitiveness in the shift-share analysis. This aligns with previous research identifying wholesale/retail as a leading sector. Transportation is another established regional strength, with a high location quotient. However, it showed a declining regional competitiveness effect in the shift-share analysis.

In summary, wholesale/retail, transportation, mining, finance, real estate, education, health, and information/communications services appear to be current and emerging leading sectors and economic bases for West Sumatra based on the quantitative analyses conducted. Targeted research and policy support in these priority export-oriented industries can help drive economic growth.

6. LIMITATIONS

Further research is needed to supplement this quantitative analysis with qualitative data on regional assets, value chains, productivity, wages, and other drivers of cluster growth in Sumatra Barat specifically. Targeted surveys, focus groups, and network analysis of these four prospective industries in the regional context could help translate these findings into tailored strategic recommendations and policies. While the LQ and DLQ analysis gives an overview of the region's changing economic structure, additional investigation is required to leverage these sectors in developing Sumatra Barat's competitive advantages. This study provides a useful starting point, but more work is needed to build a comprehensive understanding of the region's unique strategic opportunities.

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