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Analysis Of Gross Regional Domestic Product (GRDP) Of South Sumatra Province 2021–2025: Location Quotient, Shift Share, Input-Output, And Williamson Index Approaches

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Abstract

This study analyzes the economic development of South Sumatra Province during 2021–2025 using four regional analysis methods: Location Quotient (LQ), Shift Share, Input-Output (I-O), and the Williamson Index. Data were sourced from BPS South Sumatra Province and BPS RI, consistently using the Current Price basis (ADHB). The results indicate: (1) South Sumatra's GRDP grew from IDR 493.64 trillion (2021) to IDR 720.21 trillion (2025), with an average real growth rate of 4.85%; (2) LQ identifies six base sectors led by Mining (LQ=2.51); (3) Shift Share reveals that Mining has the highest differential shift (cij=IDR 30,762.36 billion); (4) The highest output multiplier belongs to Mining (1.75–1.86); (5) The Williamson Index (Vw) ranges from 0.508 to 0.630, categorizing inter-regional inequality as high, peaking in 2023, though showing a declining trend in 2024–2025. This study employs complete data from all 17 districts/cities of South Sumatra, providing a comprehensive representation of regional inequality.

Keywords: GRDP, Location Quotient, Shift Share, Williamson Index, South Sumatra

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INTRODUCTION

South Sumatra Province is a strategic region in Indonesia endowed with abundant natural resources—particularly coal, crude oil, and natural gas—making it a major contributor to regional Gross Regional Domestic Product (GRDP). The period 2021–2025 encompasses the post-COVID-19 economic recovery phase, the coal price boom of 2022, and the economic consolidation of 2023–2025. A comprehensive GRDP analysis covers the identification of base sectors, measurement of regional competitiveness, inter-sectoral linkages, and the spatial equity of development.

Previous research by Arsyad [1] affirms that identifying base sectors through the Location Quotient (LQ) is a fundamental step in regional economic planning. Bendavid-Val [2] argues that Shift Share analysis provides an information-rich decomposition of regional growth, while Williamson [3] demonstrates an inverted-U relationship between economic growth and regional disparities. This study contributes by integrating four analytical methods using complete and verified data from all 17 districts/cities of South Sumatra, sourced from BPS.

The objectives of this study are: (1) to analyze GRDP trends from 2021 to 2025; (2) to identify base sectors using LQ analysis; (3) to decompose the sources of growth using Shift Share analysis; (4) to analyze inter-sectoral linkages using Input-Output analysis; and (5) to measure regional inequality using the Williamson Index.

Objectives

The objective of this study is to analyze the GRDP of South Sumatra Province during 2021–2025 in order to identify its main growth drivers, sectoral specialization, inter-sectoral linkages, and regional inequality patterns.

More specifically, this study aims to:

- examine the trend of South Sumatra's GRDP growth over the 2021–2025 period;
- identify the base and non-base sectors using the Location Quotient method;
- analyze sectoral competitiveness using Shift Share analysis;
- measure inter-sectoral economic linkages using Input-Output analysis; and
- assess regional inequality across districts and cities using the Williamson Index.

The findings are expected to provide a clearer understanding of South Sumatra's economic structure and development challenges, as well as policy direction for more balanced and sustainable regional growth.

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LITERATURE REVIEW

Location Quotient (LQ) is an analytical tool used to identify base sectors in a region relative to a larger reference area. Arsyad [1] states that sectors with LQ>1 indicate specialization and comparative advantage that enable exports to other regions. This approach has been widely employed in Indonesian regional economic planning.

Shift Share analysis was developed to decompose changes in a region's economic variables into three components: national share (nij), proportionality or industry mix (mij), and differential shift or competitive effect (cij). Bendavid-Val [2] explains that this method reveals the extent to which regional growth is driven by national factors, industrial structure, or local competitive advantages.

The Input-Output model developed by Leontief [9] enables analysis of inter-sectoral linkages through a technology matrix (A) and the Leontief inverse $(I\text{-}A)^{-1}$. Miller and Blair [10] reinforce its theoretical foundation as a tool for regional economic planning.

The Williamson Index [3] measures the inequality of income distribution among regions; a value approaching 1 indicates high inequality, while a value approaching 0 indicates a more equitable distribution.

METHOD

3.1. Data Type and Sources

This study uses secondary time-series data for 2021–2025. GRDP data by business field (both at current prices/ADHB and constant prices/ADHK) were obtained from BPS South Sumatra Province (publication: 'Gross Regional Domestic Product of South Sumatra Province by Business Field 2020–2024'). National GDP data were sourced from BPS RI. Per capita GRDP data for all 17 districts/cities were obtained from their respective BPS offices and Databoks/Katadata. Data for 2024 are provisional (*); data for 2025 are very provisional (**). Population figures are from BPS South Sumatra Province 2023 (total population: 8,584,636).

3.2. Analytical Methods

(1) Location Quotient: LQ = (Si/S)/(Ni/N), using consistent ADHB values. LQ>1 = base sector. (2) Shift Share: decomposition into nij (national share), mij (proportionality shift/industrial mix), and cij (differential shift/competitive effect), with a national growth rate rn = 40.32%. (3) Input-Output: simplified 3-sector aggregate using technology matrix A and the Leontief Inverse $(I\text{-}A)^{-1}$. (4) Williamson Index: $Vw = \sqrt{[\Sigma(yi - \bar{y})^2 \times (fi/n)]} / \bar{y}$, using complete data from all 17 districts/cities of South Sumatra.

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RESULTS AND DISCUSSION

4.1. GRDP Growth Trends 2021–2025

Table 1 presents the development of GRDP in South Sumatra Province from 2021 to 2025.

Table 1. GRDP Development of South Sumatra Province 2021–2025

Year	GRDP ADHB (Billion IDR)	GRDP ADHK (Billion IDR)	Real Growth Rate (%)	ADHB Growth (%)	Status
2021	493,636.85	326,405.18	3.58	-	Final
2022	590,079.43	343,503.62	5.23	19.53	Final
2023	629,168.67	360,967.45	5.08	6.62	Final
2024*	663,961.72	379,119.63	5.03	5.52	Provisional
2025**	720,205.22	399,385.81	5.35	8.48	Very Provisional

*Source: BPS South Sumatra Province (processed). *Provisional; **Very Provisional*

GRDP at current prices (ADHB) grew by 45.91%, from IDR 493.64 trillion (2021) to IDR 720.21 trillion (2025). The sharp surge in 2022 (19.53%) was triggered by the coal price boom. GRDP at constant prices (ADHK) shows an average real growth rate of 4.85% per year, surpassing the national average. The stabilization phase of 2023–2024 was supported by the services sector and domestic consumption, while the acceleration in 2025 (5.35%) was driven by food crop performance.

4.2. Location Quotient (LQ) Analysis

Table 2 presents the LQ analysis results for South Sumatra Province from 2021 to 2025.

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Table 2. LQ Analysis Results for South Sumatra Province 2021–2025

Code	Sector	2021	2022	2023	2024*	2025**	Average	Cat.
A	Agriculture, Forestry & Fishery	1.11	1.05	1.05	1.07	1.06	1.07	B
B	Mining and Quarrying	2.34	2.27	2.53	2.69	2.74	2.51	B
C	Manufacturing Industry	0.84	0.79	0.81	0.83	0.83	0.82	NB
D	Electricity and Gas Supply	0.13	0.12	0.12	0.13	0.13	0.13	NB
E	Water Supply & Recycling	1.70	1.60	1.53	1.50	1.47	1.56	B
F	Construction	1.14	1.09	1.08	1.07	1.09	1.10	B
G	Wholesale & Retail Trade	1.04	1.01	1.04	1.06	1.09	1.05	B
H	Transportation & Warehousing	0.50	0.44	0.42	0.41	0.40	0.43	NB
I	Accommodation & Food Services	0.75	0.74	0.76	0.76	0.77	0.76	NB
J	Information & Communication	0.73	0.70	0.69	0.69	0.67	0.70	NB
K	Financial Services & Insurance	0.55	0.50	0.50	0.51	0.51	0.51	NB
L	Real Estate	1.17	1.16	1.19	1.25	1.35	1.22	B
M,N	Business Services	0.07	0.06	0.06	0.06	0.06	0.06	NB
O	Government Administration	0.80	0.79	0.82	0.83	0.81	0.81	NB

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Code	Sector	2021	2022	2023	2024*	2025**	Average	Cat.
P	Education Services	0.72	0.71	0.73	0.77	0.76	0.74	NB
Q	Health Services	0.53	0.52	0.50	0.50	0.49	0.51	NB
R,S,T,U	Other Services	0.43	0.39	0.36	0.34	0.32	0.37	NB

Source: BPS South Sumatra & BPS RI (processed). B=Base, NB=Non-Base

Six base sectors were identified. Mining (LQ=2.51) dominates as the primary pillar. Water Supply (LQ=1.56) ranks second, albeit with a declining trend. Real Estate (LQ=1.22) shows the most consistently rising trend (1.17→1.35), indicating property and industrial estate expansion. Eleven non-base sectors require strengthening of production capacity to reduce dependence on external supply from other regions.

4.3. Shift Share Analysis

Table 3 presents the Shift Share analysis results for South Sumatra Province covering 2021–2025.

Table 3. Shift Share Analysis Results for South Sumatra Province 2021–2025 (ADHB, Billion IDR)

Code	Sector	nij (Bil. IDR)	mij (Bil. IDR)	cij (Bil. IDR)	dij (Bil. IDR)	Competitiveness
A	Agriculture, Forestry & Fishery	29,270.36	-1,385.56	-189.21	27,695.59	Non-Competitive
B	Mining and Quarrying	41,852.15	-3,632.29	30,762.36	68,982.22	Competitive
C	Manufacturing Industry	37,982.91	-3,420.53	2,548.34	37,110.72	Competitive
D	Electricity and Gas Supply	293.37	-107.11	29.45	215.71	Competitive

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Code	Sector	nij (Bil. IDR)	mij (Bil. IDR)	cij (Bil. IDR)	dij (Bil. IDR)	Competitiveness
E	Water Supply & Recycling	239.86	-99.88	-72.76	67.22	Non-Competitive
F	Construction	23,731.81	-4,820.46	-437.55	18,473.80	Non-Competitive
G	Wholesale & Retail Trade	26,802.44	1,503.06	8,234.98	36,540.48	Competitive
H	Transportation & Warehousing	4,221.84	6,643.46	-3,556.15	7,309.15	Non-Competitive
I	Accommodation & Food Services	3,601.60	1,313.55	1,124.91	6,040.06	Competitive
J	Information & Communication	6,391.01	-42.05	-1,078.47	5,270.49	Non-Competitive
K	Financial Services & Insurance	4,728.36	-848.37	-473.64	3,406.35	Non-Competitive
L	Real Estate	6,444.20	-4,172.29	3,516.53	5,788.44	Competitive
M,N	Business Services	251.20	101.90	-166.87	186.23	Non-Competitive
O	Government Administration	5,504.51	-2,517.34	940.36	3,927.53	Competitive
P	Education Services	4,707.39	-2,420.57	1,269.63	3,556.45	Competitive
Q	Health Services	1,400.37	-293.10	-101.33	1,005.94	Non-Competitive
R,S,T,U	Other Services	1,591.42	895.56	-1,495.00	991.98	Non-Competitive
	TOTAL	198,214.80	-13,901.07	40,455.58	224,769.31	—

Source: BPS South Sumatra & BPS RI (processed). rn=40.32%

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The total national share (nij = IDR 198,214.80 billion) indicates that South Sumatra's growth remains largely dependent on national momentum. The negative total industry mix (mij = -IDR 13,901.07 billion) reflects specialization in sectors growing below the national average. Mining leads in competitive effect (cij = IDR 30,762.36 billion), followed by Wholesale & Retail Trade (IDR 8,234.98 billion) and Manufacturing (IDR 2,548.34 billion), confirming the local competitive advantage of these sectors.

4.4. Input-Output Analysis

Table 4 presents the Technology Matrix (A) and Leontief Inverse for the periods 2023–2025.

Table 4. Technology Matrix (A) and Leontief Inverse 2023–2025

Sector	Matrix A 2023	Matrix A 2024*	Leontief Inv. 2023	Leontief Inv. 2025**
Agriculture, Forestry & Fishery	0.2274	0.2400	1.2942	1.3298
Mining and Quarrying	**0.4614**	**0.4286**	**1.8583**	**1.7460**
Manufacturing Industry	**0.3112**	**0.3314**	**1.4510**	**1.4809**

*Source: BPS South Sumatra (processed). Simplified 3-sector; *Provisional; **Projection*

The Mining sector has the highest output multiplier (1.86 in 2023, declining to 1.75 in 2025), meaning that IDR 1 of final demand generates IDR 1.75–1.86 in total output. The downward trend in the Mining multiplier indicates that economic diversification is underway. The Manufacturing Industry (1.45–1.48) shows a stable-to-rising trend, reflecting a strengthening downstream processing (hilirisasi) process.

4.5. Williamson Index — 17 Districts/Cities

The Williamson Index was calculated using per capita GRDP at current prices and population data from all 17 districts/cities of South Sumatra (total population: 8,584,636, BPS South Sumatra 2023), providing a comprehensive and representative picture of regional inequality across the entire province.

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Table 5. Williamson Index of South Sumatra Province 2021–2025 (17 Districts/Cities)

Year	Data Status	Provincial Mean (Million IDR)	Vw (Index)	Category	Vw Change
2021	Final	49.22	0.5080	HIGH	-
2022	Final	64.64	0.5861	HIGH	+0.0781
2023	Final	74.38	0.6299	HIGH	+0.0438
2024*	Provisional	77.50	0.6097	HIGH	-0.0202
2025**	Projection	84.11	0.6042	HIGH	-0.0055

*Source: BPS South Sumatra, Databoks, BPS District/City (processed). *Provisional; **Projection*

The Williamson Index (Vw) increased from 0.508 in 2021 to a peak of 0.630 in 2023, as the coal boom intensified the disparity between mining-based districts (Muara Enim: IDR 187 million/capita; Musi Banyuasin: IDR 133 million/capita) and lagging districts (Empat Lawang: IDR 18.42 million/capita; Pagar Alam: IDR 24.20 million/capita). The declining trend in 2024 (0.610) and 2025 (0.604) is a positive signal that economic diversification is beginning to bear fruit, although inequality levels remain in the high category (Vw>0.50). This disparity reflects structural inequality between extractive natural-resource-based regions and those dependent on agriculture and services.

CONCLUSION

The following conclusions are drawn from this study:

1. South Sumatra's GRDP grew consistently by 45.91% (ADHB) during 2021–2025, with an average real growth rate of 4.85% per year, surpassing the national average.
2. Six base sectors were identified: Mining (LQ=2.51), Water Supply (1.56), Real Estate (1.22), Construction (1.10), Agriculture (1.07), and Wholesale & Retail Trade (1.05).

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3. Mining leads in competitive advantage (cij=IDR 30,762 billion) and output multiplier (1.75–1.86).
4. The Williamson Index (Vw=0.508–0.630) confirms persistently high inter-regional inequality throughout the study period, peaking in 2023 due to an unevenly distributed natural resource boom. The declining Vw trend since 2023 is a positive signal, yet inter-regional convergence remains insignificant.

Based on these findings, the following policy recommendations are proposed: (1) diversify the economy away from dependence on extractive sectors; (2) accelerate downstream processing (hilirisasi) of coal, rubber, and palm oil; (3) redistribute natural resource revenue sharing (DBH) to non-mining districts such as Empat Lawang, OKU Selatan, and Pagar Alam; and (4) develop infrastructure in districts with low per capita GRDP.

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