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The Dynamics of Economic Structure in Aceh Tamiang Regency and Its Implications for Sectoral Competitiveness

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A B S T R A C T

This study analyzes the dynamics of Aceh Tamiang Regency's economic structure during 2020–2024 and its implications for sectoral competitiveness using classical shift-share analysis (Dunn, 1960), decomposing GRDP growth into the regional share (Ns), proportional shift (Ps), and differential shift (Ds), complemented by Location Quotient (LQ) analysis to identify base sectors. Results show that Aceh Tamiang's economy grew by 11.07 percent, slower than Aceh Province's 16.87 percent, reducing the regency's contribution to provincial GRDP from 4.57 to 4.34 percent. Both Ps and Ds were negative (IDR -120.16 billion and IDR -228.70 billion), reflecting a sectoral structure dominated by slow-growing industries and weak local competitiveness. Only the Other Services sector is progressive (Quadrant I), while Agriculture, Forestry, and Fishery, the largest base sector (LQ 1.43), falls into Quadrant IV (lagging). Trade, Transportation and Warehousing, and Information and Communication show a favorable industry mix but weak competitiveness (Quadrant II). These findings underscore the urgency of structural transformation and productivity strengthening in base sectors, particularly downstream diversification of agricultural and mining outputs, to prevent Aceh Tamiang from falling further behind Aceh Province's aggregate growth.

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INTRODUCTION

Regional economic growth within the framework of fiscal decentralization in Indonesia cannot be fully understood merely by observing aggregate growth rates. High Gross Regional Domestic Product (GRDP) growth figures may conceal structural fragilities if such growth is supported by sectors experiencing slowdowns at the national or regional levels. Conversely, moderate growth rates may mask local competitive advantages that hold promise over a long-term horizon. This issue underlines the necessity of decomposing regional economic growth into its constituent components, as initially formalized by Dunn (1960) through the technique widely known as Shift-Share Analysis.

Aceh Tamiang Regency is located on the east coast of Aceh Province and has historically relied on agriculture, forestry, and fishery, as well as mining and quarrying, as its primary economic pillars. Prior studies on eastern Aceh indicate that Aceh Tamiang, alongside Eastern Aceh Regency, is still categorized as a relatively underdeveloped region compared to other regencies and cities in Aceh Province (Nurlina et al., 2023). Although the regional economic structure is dominated by the primary sector, the question of whether this dominance is accompanied by adequate competitive advantage has not been widely addressed empirically, particularly using recent post-COVID-19 GRDP data. The 2020-2024 period holds particular analytical relevance as it encompasses the post-pandemic economic recovery phase, alongside the consolidation period of the Aceh special autonomy development policy. During this timeframe, indicators suggest that the aggregate GRDP growth rate of Aceh Province outpaced that of several constituent regencies, including Aceh Tamiang, raising concerns regarding intra-regional growth divergence. This phenomenon aligns with findings in other regional contexts, such as rural areas in Heilongjiang Province, China, which demonstrate that a mismatch between industrial structure and competitive advantage can cause regional economic growth to lag behind broader aggregate growth, despite the region possessing highly competitive potential (Lv et al., 2021).

Shift-Share Analysis was selected as the primary instrument in this study due to its capability to decompose total regional GRDP changes into three complementary components: (1) Regional Share (Ns), reflecting the growth share purely driven by the growth rate of the reference area (the province); (2) Proportional Shift or industry mix (Ps), reflecting the influence of the region's sectoral composition on its growth, depending on whether the region concentrates on sectors growing rapidly or slowly at the provincial level; and (3) Differential Shift or competitive advantage (Ds), reflecting the pure competitive strength or weakness of a specific sector within the region compared to the performance of the same sector at the provincial level (Esteban-Marquillas, 1972; Houston, 1967). When analyzed simultaneously through quadrant classification, these three components enable the identification of progressive, developing, potential, and lagging sectors (Loveridge & Selting, 1998). Consequently, this produces a sharper empirical basis for sectoral development policy formulation compared to a simple analysis of aggregate GRDP growth.

Based on the aforementioned context, this study aims to: (1) describe the dynamics of the economic structure of Aceh Tamiang Regency for the 2020–2024 period based on sectoral contributions to GRDP; (2) decompose the GRDP growth of Aceh Tamiang Regency into regional share, proportional shift, and differential shift components using Aceh Province as the reference area; (3) identify base (leading) sectors through Location Quotient analysis; and (4) formulate policy implications based on the sectoral competitive quadrant classification. The novelty of this study lies in its utilization of recent GRDP data (2020–2024) spanning the post-pandemic recovery period, which has been under-researched in previous Shift-Share studies in the Aceh region, as most prior works utilized pre-2020 data (Nurlina et al., 2023).

LITERATURE REVIEW

Regional Economic Growth Theory and Shift-Share Analysis

Shift-Share Analysis was formally introduced by Dunn (1960) in his work "A Statistical and Analytical Technique for Regional Analysis," which later became part of a comprehensive study by Perloff, Dunn, Lampard, and Muth on regional economic growth in the United States. The fundamental principle of this method is that changes in an economic variable (output, income, or employment) within a region can be decomposed into a portion attributed to the growth trend of a broader reference area, a portion driven by the region's sectoral composition, and a residual portion reflecting pure local competitive advantage (Dunn, 1960).

Since its inception, the classical Shift-Share model has faced several methodological critiques. Houston (1967) argued that the competitive share component is not entirely independent of the industrial mix component, which may bias the interpretation of pure competitiveness. This critique was addressed by Esteban-Marquillas (1972) through a reinterpretation of the model that separates the pure competitive effect (homothetic competitive effect) from the allocation effect, thereby enhancing the analytical validity of competitive advantage interpretations. Subsequent developments led to the dynamic Shift-Share model proposed by Barff and Knight (1988), which calculates the three Shift-Share components annually to capture short-term fluctuations that are typically lost in a comparative-static two-point-in-time approach. On the spatial dimension, Nazara and Hewings (2004) extended the Shift-Share model by incorporating spatial interaction structures between neighboring regions, while the most recent advancement by Montanía et al. (2024) proposed a more comprehensive Shift-Share framework that integrates multiple dimensions of decomposition simultaneously. Loveridge and Selting (1998) conducted a systematic review of various Shift-Share identity variants and concluded that although the Esteban-Marquillas model is widely cited, the classical model and some of its derivatives demonstrate superior intra-model consistency in component correlation tests.

Sectoral Competitiveness and the Location Quotient Concept

The concept of regional competitiveness in this study refers to Porter's (1990) notion of competitive advantage, which emphasizes that a region's prosperity is not merely inherited from natural factor endowments but is created through resource productivity in industries capable of competing relatively against other regions. In a narrower regional context, the differential shift component in Shift-Share Analysis can be interpreted as a quantitative proxy for such sectoral competitiveness, as it measures the extent to which a sector in a specific region grows faster or slower than the identical sector in the reference area, after controlling for aggregate growth and sectoral composition influences (Esteban-Marquillas, 1972). To complement the Shift-Share Analysis, this study employs the Location Quotient (LQ), a double-ratio index that measures the relative concentration of a sector in a region compared to its concentration in the reference area (Isard, 1960). Isserman (1977) asserted that the LQ approach is one of the most widely utilized techniques to identify a region's economic base, despite structural limitations regarding assumptions of homogeneous production functions and consumption patterns across regions. Sectors with an LQ value greater than one is classified as base sectors with the potential to drive inter-regional exports (Krugman, 1991), whereas sectors with an LQ less than one are categorized as non-base sectors oriented toward meeting local demand.

Quadrant Classification of Sectoral Competitiveness

The combination of the proportional shift (Ps) and differential shift (Ds) components allows for the classification of economic sectors into four distinct quadrants (Loveridge & Selting, 1998):

- **Quadrant I (Positive Ps, Positive Ds):** Progressive sectors, characterized by a favorable industry mix and strong local competitiveness.
- **Quadrant II (Positive Ps, Negative ads):** Developing sectors, belonging to industry groups that grow rapidly at the provincial level, yet exhibit weak local competitiveness.
- **Quadrant III (Negative Ps, Positive Ds):** Potential sectors, categorized within slow-growing provincial industries but demonstrating robust local competitiveness.
- **Quadrant IV (Negative Ps, Negative Ads):** Lagging sectors, positioned within slow-growing industries while simultaneously demonstrating weak local competitiveness.

Prior Empirical Studies

Various international empirical studies have confirmed the utility of Shift-Share Analysis as a diagnostic tool for regional development. In Banyuwangi Regency, Khusaini (2015) found that the agriculture, mining, and manufacturing sectors were no longer the primary drivers of the economy, having been replaced by trade, hotels and restaurants, construction, services, and finance, which contributed to a positive net shift exceeding 25 percent. In another developing country context, Lv et al. (2021) observed that low-level agricultural and secondary industrial structures across five regencies in Heilongjiang Province, China, caused a loss in competitive effects despite highly competitive potential, whereas the service-based tertiary industry exhibited superior performance. In the European context, Braičić et al. (2024) demonstrated that the local

competitiveness of the Varaždin-Koprivnica region in Croatia varied significantly across sectors during 2009–2020, with non-tradable service sectors displaying higher resilience than export-oriented manufacturing sectors.

Specifically, within the context of Aceh, research by Nurlina et al. (2023) utilized the Klassen Typology, LQ, Shift-Share, and SWOT analysis to evaluate the Eastern Aceh region, including Aceh Tamiang Regency. They concluded that both regencies were classified as underdeveloped areas based on 2010–2017 data, with the mining and quarrying sector serving as the base sector in Eastern Aceh Regency, and wholesale and retail trade and vehicle repair showing competitive advantages. That study serves as an important reference for the present research due to its identical geographical locus; however, it differs in terms of data temporal coverage, as this study examines the post-pandemic period of 2020–2024, which has not been previously explored.

METHODOLOGY

Data Type and Sources

This study adopts a descriptive quantitative approach with a two-point-in-time comparative-static design. The data utilized consist of secondary data on Gross Regional Domestic Product (GRDP) at constant market prices across 17 economic sectors (in accordance with the KBLI/ISIC classification) for Aceh Tamiang Regency and Aceh Province. The base year is 2020 and the terminal year is 2024, obtained from the official publications of the BPS-Statistics of Aceh Tamiang Regency and BPS-Statistics of Aceh Province. Aceh Province serves as the reference area, given that Aceh Tamiang Regency is administratively and economically integrated within the province.

Classical Shift-Share Model

Following the classical Shift-Share framework formalized by Dunn (1960) and delineated by Loveridge and Selting (1998), the total change in GRDP for sector *i* in Aceh Tamiang Regency from period *t* to *t*+*n* is decomposed into three components as follows:

$$\Delta Eij = Nsij + Psij + Dsij$$

Where the components are defined as:

Nsij : $Eij \times rn$
Psij : $Eij \times (ri - rn)$
Dsij : $Eij \times (rij - ri)$

Where:

Eij : GRDP of sector *i* in Aceh Tamiang Regency in the base year (2020).

Rn : Total GRDP growth rate of Aceh Province during the 2020–2024 period.

Ri : GRDP growth rate of sector *i* at the provincial level during the same period.

Rij : GRDP growth rate of sector *i* in Aceh Tamiang Regency during the same period.

The component Nsij (regional share/national share) reflects the growth portion of sector *i* solely driven by the aggregate growth rate of the reference area. The component Psij (proportional shift) captures the industry mix effect, which is the difference between the growth rate of sector *i* at the provincial level and the total provincial growth rate. The component Dsij (differential shift) represents the pure competitive advantage of sector *i* within the regency, measured as the difference between the sector's growth rate in the regency and that of the same sector at the provincial level (Esteban-Marquillas, 1972; Houston, 1967). The summation of these three components is identical to the total change in GRDP for sector *i* ($\Delta Eij = Eij(2024) - Eij(2020)$), thereby serving as an accounting identity to ensure mathematical consistency.

Quadrant Classification

Economic sectors are subsequently categorized into four quadrants based on the sign combinations of the Ps and Ds components, following Loveridge and Selting (1998): Quadrant I/Progressive ($Ps > 0, Ds > 0$), Quadrant II/Developing ($Ps > 0, Ds \leq 0$), Quadrant III/Potential ($Ps \leq 0, Ds > 0$), and Quadrant IV/Lagging ($Ps \leq 0, Ds \leq 0$).

Location Quotient (LQ)

To identify the economic base sectors, Location Quotient (LQ) values are calculated using the following formula (Isard, 1960; Isserman, 1977):

$$LQi = (Eij / Ej) / (Ein / En)$$

Where:

Eij : GRDP of sector *i* in Aceh Tamiang Regency.

Ej : Total GRDP of Aceh Tamiang Regency

Ein : GRDP of sector *i* in Aceh Province

En : Total GRDP of Aceh Province, with all variables calculated for both 2020 and 2024.

An LQ > 1 denotes a relatively higher concentration of sector *i* in Aceh Tamiang Regency compared to Aceh Province, thus classifying it as a base sector; An LQ = 1 indicates an equivalent concentration level, whereas an LQ < 1 indicates that the sector is not concentrated (non-base sector).

Data Processing Techniques

All computations were executed using the Python programming language, utilizing the panda's library for numerical data manipulation. Calculation consistency was validated by ensuring that the sum of the Ns, Ps, and Ds components for each sector equated to the total GRDP change for that sector, and that the sum of the GRDP across all 17 sectors aligned with the total GRDP published by BPS (with a rounding error margin under 0.01 percent).

RESEARCH RESULT

Dynamics of the Economic Structure of Aceh Tamiang Regency (2020–2024)

During the 2020–2024 period, the GRDP of Aceh Tamiang Regency at constant prices grew from IDR 6,009,374.2 million to IDR 6,674,381.4 million, representing a cumulative growth of 11.07 percent (equivalent to a Compound Annual Growth Rate/CAGR of 2.66 percent). This growth was significantly slower than the aggregate GRDP expansion of Aceh Province over the same period, which grew by 16.87 percent (CAGR of 3.97 percent), rising from IDR 131,580,970 million to IDR 153,780,440 million. Consequently, the proportional contribution of Aceh Tamiang Regency's GRDP to the total provincial GRDP contracted from 4.57 percent in 2020 to 4.34 percent in 2024. This baseline finding provides strong evidence that Aceh Tamiang Regency underwent growth divergence relative to the broader provincial economy, setting the foundation for the detailed decomposition analysis in the subsequent section.

Table 1 presents the GRDP data across 17 economic sectors for Aceh Tamiang Regency and Aceh Province in 2020 and 2024. In 2020, the economic structure of Aceh Tamiang Regency was heavily dominated by the Agriculture, Forestry, and Fishery sector with a share of 41.01 percent, followed by Mining and Quarrying at 14.08 percent, and Wholesale and Retail Trade at 9.55 percent. By 2024, although Agriculture, Forestry, and Fishery remained the dominant sector, its share contracted to 39.30 percent, while the Mining and Quarrying sector's share also fell to 13.01 percent. In contrast, the Manufacturing industry's share increased from 5.75 percent to 6.54 percent, and Transportation and Warehousing expanded markedly from 2.89 percent to 3.70 percent. This shift denotes the onset of structural transformation, even though primary sector dominance remains substantial.

Table 1. GRDP at Constant Prices of Aceh Tamiang Regency and Aceh Province by Economic Sector, 2020 and 2024 (Million IDR)

Economic Sector	PDRB Kab. 2020	PDRB Kab. 2024	PDRB Prov. 2020	PDRB Prov. 2024
Agriculture, Forestry, and Fishery	2.464.574,3	2.623.098,1	37.899.520	42.121.370
Mining and Quarrying	845.993,7	868.074,2	10.485.330	11.483.250
Manufacturing	345.477,6	436.314,7	6.058.650	6.559.190
Electricity and Gas Supply	6.753,9	7.254,9	217.370	251.690
Water Supply, Sewerage, Waste Management	2.286,8	2.697,9	50.110	59.540
Construction	358.007,1	381.363,3	13.900.440	14.633.070
Wholesale & Retail Trade; Motor Vehicle Repair	573.690,1	659.237,8	19.238.230	23.851.560
Transportation and Warehousing	173.909,5	247.040,4	7.056.690	11.353.090
Accommodation and Food Service Activities	64.318,3	87.233,0	1.649.240	2.282.560
Information and Communication	230.461,2	274.212,5	5.187.370	6.629.650
Financial and Insurance Activities	67.264,3	70.835,8	2.355.950	2.287.200
Real Estate Activities	243.774,5	280.027,0	5.445.680	6.323.520
Business Activities	20.399,2	22.593,7	840.810	970.860
Public Administration, Defense, Social Security	225.629,3	250.986,1	11.459.040	13.335.480
Education	116.335,3	125.396,8	3.651.650	4.079.450
Human Health and Social Work Activities	167.338,5	205.001,0	4.170.440	5.114.250
Other Services Activities	103.160,7	133.014,2	1.914.460	2.444.720

Source: BPS-Statistics of Aceh Tamiang Regency and BPS-Statistics of Aceh Province, processed data (2026).

Shift-Share Decomposition Results

The total provincial GRDP growth rate (r_n) of 16.87 percent for the 2020–2024 period was applied to compute the regional share (Ns) component across all sectors. Table 2 itemizes the complete Shift-Share decomposition findings for the 17 economic sectors of Aceh Tamiang Regency.

Table 2. Shift-Share Decomposition Results of Aceh Tamiang Regency's GRDP, 2020–2024 (Million IDR)

Economic Sector	Ns	Ps	Ds	Total Change	Quadrant
Agriculture, Forestry, and Fishery	415.806,7	-141.263,3	-116.019,6	158.523,8	IV
Mining and Quarrying	142.730,5	-62.214,7	-58.435,2	22.080,5	IV
Manufacturing	58.286,7	-29.744,8	62.295,2	90.837,1	III
Electricity and Gas Supply	1.139,5	-73,1	-565,4	501,0	IV
Water Supply, Sewerage, Waste Management	385,8	44,5	-19,2	411,1	II
Construction	60.400,6	-41.531,6	4.487,2	23.356,2	III
Wholesale & Retail Trade; Motor Vehicle Repair	96.789,2	40.781,8	-52.023,3	85.547,7	II
Transportation and Warehousing	29.340,9	76.542,3	-32.752,3	73.130,9	II
Accommodation and Food Service Activities	10.851,4	13.847,3	-1.784,0	22.914,7	II
Information and Communication	38.881,9	25.194,8	-20.325,4	43.751,3	II
Financial and Insurance Activities	11.348,4	-13.311,3	5.534,4	3.571,5	III
Real Estate Activities	41.128,0	-1.831,7	-3.043,8	36.252,5	IV
Business Activities	3.441,6	-286,4	-960,7	2.194,5	IV
Public Administration, Defense, Social Security	38.066,7	-1.119,4	-11.590,4	25.356,8	IV
Education	19.627,3	-5.998,3	-4.567,5	9.061,5	IV
Human Health and Social Work Activities	28.232,2	9.638,0	-207,8	37.662,5	II
Other Services Activities	17.404,6	11.168,5	1.280,4	29.853,5	I
Total	1.013.861,8	-120.157,5	-228.697,3	665.007,1	-

Note: Ns = regional share; Ps = proportional shift (industry mix); Ds = differential shift (competitiveness). Quadrant I = Progressive; II = Developing; III = Potential; IV = Lagging.
Source: Processed data (2026).

In aggregate, the total Ns value of IDR 1,013,861.8 million signifies that if all economic sectors in Aceh Tamiang Regency had grown at par with the provincial baseline, the regency's GRDP would have expanded by approximately IDR 1.01 trillion. However, the total Ps component of minus IDR 120,157.5 million indicates that Aceh Tamiang's sectoral composition is net-dominated by industries that grew more slowly at the provincial level relative to the overall provincial aggregate. Furthermore, the total Ds component of minus IDR 228,697.3 million reveals that, on a net basis, the regency's sectors expanded at a slower pace compared to their counterparts at the provincial level. The conflation of these two negative components explains why the actual GRDP increase in Aceh Tamiang Regency (IDR 665,007.1 million or 11,07 percent) fell considerably below the benchmark growth expected from provincial trends (IDR 1,013,861.8 million or 16,87 percent).

Quadrant Classification of Sectoral Competitiveness

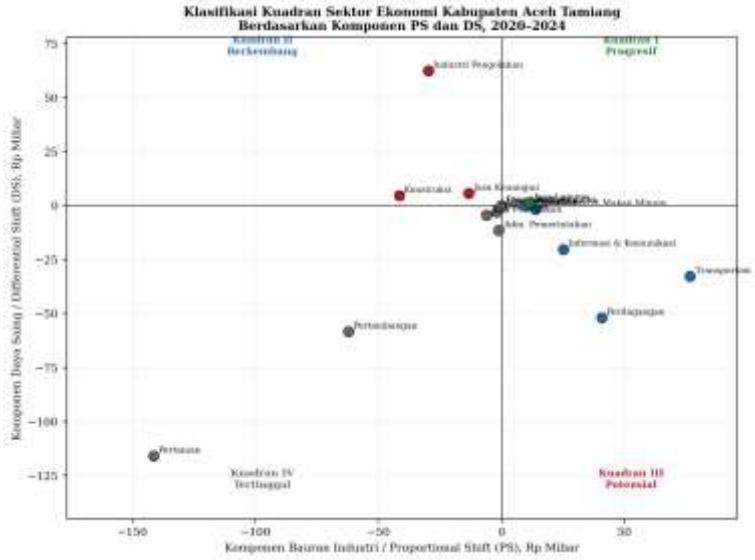
Based on the intersection of the Ps and Ds component signs as illustrated in Figure 1, the economic sectors of Aceh Tamiang Regency are distributed across four quadrants. First, Quadrant I (Progressive) is occupied by only one sector: Other Services Activities, with a Ps of IDR 11,168.5 million and a Ds of IDR 1,280.4 million. This sector stands out as the sole economic activity possessing a favorable industrial mix alongside positive local competitiveness, making it a strong candidate for targeted development policy despite its relatively minor initial contribution to total GRDP (1.72 percent in 2020).

Second, Quadrant II (Developing) encompasses six sectors: Wholesale and Retail Trade (Ps: IDR 40,781.8 million; Ds: minus IDR 52,023.3 million), Transportation and Warehousing (Ps: IDR 76,542.3 million; Ds: minus IDR 32,752.3 million), Information and Communication (Ps: IDR 25,194.8 million; Ds: minus IDR 20,325.4 million), Human Health and Social Work Activities (Ps: IDR 9,638.0 million; Ds: minus IDR 207.8 million), Accommodation and Food Service Activities (Ps: IDR 13,847.3 million; Ds: minus IDR 1,784.0 million), and Water Supply, Sewerage, Waste Management (Ps: IDR 44.5 million; Ds: minus IDR 19.2 million). Sectors in this quadrant benefit from a provincial industry mix that expands rapidly, particularly Transportation and Warehousing, which grew aggressively province-wide due to post-pandemic mobility restoration. Nonetheless, local competitiveness in Aceh Tamiang has yet to match the average provincial baseline for these sectors.

Third, Quadrant III (Potential) includes three sectors: Manufacturing (Ps: minus IDR 29,744.8 million; Ds: IDR 62,295.2 million), Construction (Ps: minus IDR 41,531.6 million; Ds: IDR 4,487.2 million), and Financial and Insurance Activities (Ps: minus IDR 13,311.3 million; Ds: IDR 5,534.4 million). The Manufacturing sector warrants specific attention because it registers the second-highest positive Ds value after the Ns component, pointing to a robust local competitive edge despite the sector expanding relatively slowly at the provincial level. This finding aligns with typical Shift-Share patterns in developing economies, where small-to-medium manufacturing nodes display localized competitive advantages despite functioning within an unfavorable wider industrial trend (Lv et al., 2021).

Fourth, and most concerning from a policymaking standpoint, Quadrant IV (Lagging) contains seven sectors, including the two largest contributors to Aceh Tamiang Regency's GRDP: Agriculture, Forestry, and Fishery (Ps: minus IDR 141,263.3 million; Ds: minus IDR 116,019.6 million) and Mining and Quarrying (Ps: minus IDR 62,214.7 million; Ds: minus IDR 58,435.2 million). Other sectors in this quadrant comprise Real Estate Activities, Public Administration, Education, Business Activities, and Electricity and Gas Supply. The reality that the agricultural sector which accounted for more than 41 percent of the regency's GRDP in 2020 is situated within the lagging quadrant represents the most critical insight of this study. It signifies that the primary engine of the regency's economy is undergoing a double structural contraction: it is tied to sub-sectors growing slowly at the provincial level, and its localized productivity or value-added output is expanding at a slower rate than the aggregate agricultural sector province-wide.

Figure 1. Quadrant Classification of Aceh Tamiang Regency's Economic Sectors Based on Ps and Ds Components, 2020–2024.



Location Quotient (LQ) Analysis

Table 3 details the Location Quotient values for the 17 economic sectors of Aceh Tamiang Regency for the years 2020 and 2024. Six sectors consistently demonstrated LQ values greater than one across both periods, namely Mining and Quarrying (LQ of 1.77 in 2020 and 1.74 in 2024), Agriculture, Forestry, and Fishery (LQ of 1.42 and 1.43), Manufacturing (LQ rising from 1.25 to 1.53), Other Services Activities (LQ increasing from 1.18 to 1.25), Water Supply, Sewerage, Waste Management (LQ rising from 1.00 to 1.04), and Real Estate Activities (LQ shifting from 0.98 to 1.02, thereby becoming a base sector by 2024).

The LQ results reinforce the patterns identified via the Shift-Share Analysis. Mining and Quarrying, alongside Agriculture, Forestry, and Fishery, constitute the primary economic base of Aceh Tamiang Regency, with concentration levels that greatly outstrip the provincial average. However, as shown previously, base sector status does not automatically translate into

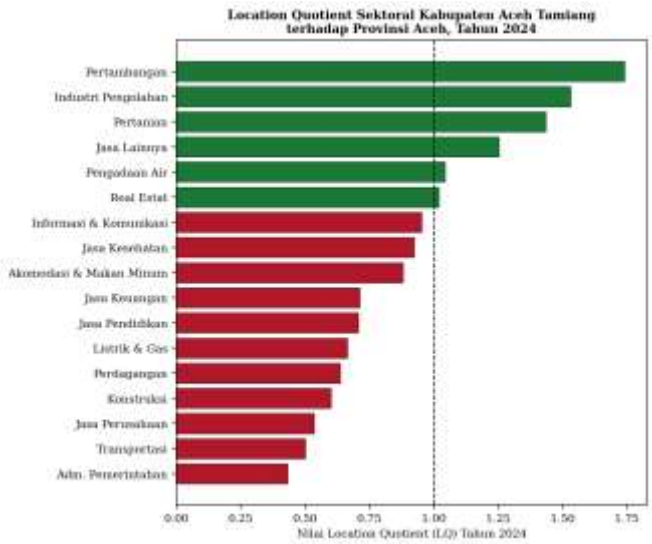
superior competitive edge; these two primary base sectors reside in Quadrant IV (Lagging) under the Shift-Share Analysis. This dynamic highlight a structural paradox: the region is highly specialized (base) in sectors that are actively losing their relative competitive advantage against the reference area. Porter (1990) identified this pattern as a critical warning sign that natural resource-based comparative advantages have failed to transform into productivity-driven competitive advantages.

Conversely, the Manufacturing sector reveals a highly promising trajectory: its LQ increased significantly from 1.25 to 1.53 over the five-year span, reinforcing its position in Quadrant III (Potential), which indicates positive competitiveness (Ds). The combination of accelerating specialization (LQ) and positive competitive edge (Ds) renders this sector a strong candidate for mid-term priority development, particularly through downstream industrial processing of agricultural and mining outputs that supply raw materials within this zone.

Table 3. Sectoral Location Quotient (LQ) of Aceh Tamiang Regency relative to Aceh Province, 2020 and 2024

Economic Sector	LQ 2020	LQ 2024	Status
Agriculture, Forestry, and Fishery	1,42	1,43	Base Sector
Mining and Quarrying	1,77	1,74	Base Sector
Manufacturing	1,25	1,53	Base Sector
Electricity and Gas Supply	0,68	0,66	Non-Base Sector
Water Supply, Sewerage, Waste Management	1,00	1,04	Base Sector
Construction	0,56	0,60	Non-Base Sector
Wholesale & Retail Trade; Motor Vehicle Repair	0,65	0,64	Non-Base Sector
Transportation and Warehousing	0,54	0,50	Non-Base Sector
Accommodation and Food Service Activities	0,85	0,88	Non-Base Sector
Information and Communication	0,97	0,95	Non-Base Sector
Financial and Insurance Activities	0,63	0,71	Non-Base Sector
Real Estate Activities	0,98	1,02	Base Sector
Business Activities	0,53	0,54	Non-Base Sector
Public Administration, Defense, Social Security	0,43	0,43	Non-Base Sector
Education	0,70	0,71	Non-Base Sector
Human Health and Social Work Activities	0,88	0,92	Non-Base Sector
Other Services Activities	1,18	1,25	Base Sector

Figure 2. Sectoral Location Quotient (LQ) of Aceh Tamiang Regency Relative to Aceh Province, 2024.



Implications for Sectoral Competitiveness and Regional Development Policy

The aforementioned findings provide several crucial implications for the formulation of economic development strategies in Aceh Tamiang Regency. First, the high structural dependency on the Agriculture, Forestry, and Fishery sector (39.30 percent share in 2024) situated within Quadrant IV demands rigorous policy intervention. Without structural modifications, this sector risks becoming a major bottleneck to the regency's long-term aggregate growth. Mirroring the findings of Lv et al. (2021) in the Chinese context, a misalignment between traditional agrarian frameworks and dynamic provincial trends can cause agricultural regions to lag behind increasingly, unless modernization and productivity gains are introduced via mechanization, crop diversification toward high-value commodities, and downstream supply chain reinforcement.

Second, the simultaneous expansion of the LQ index and positive competitive advantage (Ds) within the Manufacturing sector serves as an empirical signal that downstream industrialization strategies transforming primary agricultural and mineral commodities into higher value-added goods align with ongoing structural trends, moving beyond a merely prescriptive goal. Affirmative actions, such as investment incentives for agricultural processing plants (crude palm oil derivatives, rubber processing, or downstream fishery goods), hold the potential to transition this sector into Quadrant I (Progressive) over the medium term.

Third, sectors positioned within Quadrant II (Developing), specifically Wholesale and Retail Trade, Transportation and Warehousing, and Information and Communication, show that Aceh Tamiang Regency operates within a favorable industry mix, yet remains unable to fully leverage this momentum competitively. This gap likely stems from locational constraints and infrastructure deficits. For instance, while the provincial transportation and warehousing sector grew rapidly by 61 percent, the regency level only managed a 42 percent expansion. Upgrading connective infrastructure such as roads, ports, and regional logistics hubs is crucial to transform this favorable industry mix into tangible competitive execution.

Fourth, the positioning of Other Services Activities as the sole occupant of Quadrant I warrants recognition as a local success story from which lessons can be extracted, despite its minimal contribution to total GRDP (1.99 percent in 2024). Further qualitative survey-based research into service-sector operators within Aceh Tamiang could offer deep insights into the drivers of its competitiveness, which might be replicable across other sectors.

Overall, the structural trends identified in this research correspond with the findings of Nurlina et al. (2023) regarding the Eastern Aceh zone, which designated Aceh Tamiang as an underdeveloped regency. However, this study updates those conclusions with contemporary data, demonstrating that this underdevelopment does not stem from absolute economic stagnation (as the regency's GRDP maintained a positive growth rate of 11.07 percent), but rather from relative divergence against a more dynamic provincial benchmark (16.87 percent). This vital distinction is uniquely brought to light through the descriptive lens of Shift-Share decomposition rather than basic aggregate comparisons.

CONCLUSIONS AND RECOMMENDATIONS

Based on the Shift-Share Analysis applied to the GRDP of Aceh Tamiang Regency during the 2020–2024 period using Aceh Province as the reference area, several conclusions can be drawn:

1. The economy of Aceh Tamiang Regency grew by 11.07 percent during the analysis period, lagging behind the provincial growth baseline of 16.87 percent, which compressed the regency's aggregate share of provincial GRDP from 4.57 percent to 4.34 percent.
2. Collectively, both the industrial mix component (Ps = minus IDR 120,157.5 million) and the competitive edge component (Ds = minus IDR 228,697.3 million) were negative, indicating that the regency's growth deceleration is concurrently driven by an unfavorable sectoral structure and weak localized competitive capacity.
3. Quadrant mapping indicates that only the Other Services Activities sector is categorized as progressive (Quadrant I); six sectors are classified as developing (Quadrant II); three sectors are potential (Quadrant III); and seven sectors including the two core economic pillars (Agriculture and Mining) are categorized as lagging (Quadrant IV).
4. The Location Quotient analysis confirms that Aceh Tamiang possesses six economic base sectors, with Mining and Quarrying (LQ 1.74) and Agriculture, Forestry, and Fishery (LQ 1.43) holding the highest specialization. However, both face a decline in active competitiveness according to the Shift-Share results, exposing a structural paradox between regional specialization and actual competitive execution.
5. The Manufacturing sector stands out as the most promising economic node, demonstrating an expansion in its LQ index from 1.25 to 1.53, backed by positive competitive advantage (Ds = IDR 62,295.2 million), marking it as the prime target for mid-term developmental focus via localized downstream value-chain strategies.

Recommendations

Based on the empirical insights generated, this study proposes several policy recommendations:

1. The local government of Aceh Tamiang Regency should prioritize modernizing programs and productivity enhancements within the Agriculture, Forestry, and Fishery sector, given its massive contribution to total GRDP alongside its lagging competitiveness, achieved through agricultural intensification, product diversification, and expanding credit access for smallholders.
2. Affirmative action's targeting downstream industrialization should be implemented for local commodities (palm oil, rubber, and fisheries output) to solidify the growth of the Manufacturing sector, which has already established a positive competitive track record.
3. Infrastructure enhancements specifically focusing on road networks, marine ports, and logistical nodes must be prioritized to convert the favorable industry mix found in trade, transport, and communications into actual local competitive advantage.

Future research paths are encouraged to expand this analytical framework through dynamic Shift-Share approaches (Barff & Knight, 1988) using comprehensive annualized datasets to capture short-run annual shocks that a comparative-static model cannot fully trace. Furthermore, subsequent studies could refine these results by using the Esteban-Marquillas (1972) adjustment to isolate pure competitive components from allocation effects, and integrate spatial econometric properties across regencies (Nazara & Hewings, 2004) to map out economic interactions between Aceh Tamiang and its neighboring coastal regencies in eastern Aceh.

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