Transformation of Economic Structure and Leading Sectors During the 2020-2024 Period (A Study in Banggai Regency)

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ABSTRACT

The economic structure of Banggai Regency has undergone significant transformation amidst post-pandemic recovery and shifting development dynamics. This research analyzes the transformation of economic structure and leading sectors in Banggai Regency during the period 2020–2024 as a response to post-pandemic development dynamics. The purpose of this research is to identify the direction of economic structural changes as well as sectors that have comparative advantages and significant contributions to regional growth. The method used is a descriptive quantitative approach with secondary data analysis obtained from the Central Statistics Agency (BPS) of Banggai Regency and BPS of Central Sulawesi Province. Three main analytical tools were used: Location Quotient (LQ) to identify base sectors, Growth Ratio Model (GRM) to analyze sectoral growth dynamics over time, and Shift Share Analysis (SSA) to assess sectoral performance and competitiveness. The research results show an economic shift from the primary sector toward the industrial and service sectors, with agriculture, mining, transportation, financial services, and real estate as the main base sectors. Meanwhile, the manufacturing industry and trade sectors have long-term growth potential. In conclusion, Banggai's economic transformation is directed toward economic diversification and modernization that demands policies to strengthen value-added sectors and improve regional competitiveness.

Keywords: Economic Transformation, Economic Structure, Leading Sectors, Growth Ratio Model

1. INTRODUCTION

Regional economic development is one of the main pillars in efforts to improve community welfare and equitable distribution of national development outcomes. Changes in economic structure, namely shifts in composition between primary, secondary and tertiary sectors, are often viewed as indicators of economic progress in a region. As an example, in many regions in Indonesia it has been found that economic activity shifts from dominance of the agricultural sector toward the industrial and service sectors. At both national and regional levels, identification of leading sectors becomes important because these sectors have competitive or comparative advantages that can become the main drivers of regional economic growth. As an illustration, a study in South Kalimantan Province found that the mining sector dominates but to realize economic transformation, the development of the manufacturing industry and service sectors is needed as new leading sectors (Lestiyana et al., 2024)

Specifically in the Central Sulawesi region, one study shows that although the agriculture, forestry and fisheries sectors still play a dominant role, there has begun to be a shift to the manufacturing industry and service sectors as new potential leading sectors (Cokro et al., 2025). In this context, Banggai Regency has considerable potential in various agricultural, fisheries, mining, and natural resource-based manufacturing industry sectors that make it a highly relevant location for studying economic structural transformation and identifying leading sectors.

The period 2020-2024 was chosen because it includes several important phases: recovery from the COVID-19 pandemic, changes in national and regional policies, and quite significant global and local

economic dynamics. Analysis of economic structural transformation over these five years will provide an overview of how the regional economy reacts to challenges and opportunities, as well as how leading sectors emerge or change their roles. Following table 1 is the GRDP of Banggai Regency for the Period 2020-2024.

Table 1. GRDP Table of Banggai Regency for the Period 2020-2024

Agriculture, Forestry, and Fisheries	3952,28	4093,84	4157,29	4296,69	4309,3
Mining and Quarrying	5291,98	5251,97	5764,73	5830,66	6180,2
Manufacturing Industry	4525,69	4419,44	4932,14	4967,7	5093,1
Electricity and Gas Procuremen	4,47	4,63	5,1	5,44	5,7
Water Supply, Waste Management, Sewerage, and Recycling	11,51	12,2	12,6	12,98	13,5
Construction	1220,43	1266,77	1289,89	1328,49	1366,2
Wholesale and Retail Trade, Motor Vehicle and Motorcycle Repair	813,14	887,17	959,75	1028,47	1063,8
Transportation and Warehousing	347,54	385,49	441,94	466,64	482,4
Accommodation and Food Service Provision	51,2	58,94	64,84	70,19	74,5
Information and Communication	508,46	568,62	603,18	637,66	676,3
Financial Services and Insurance	316,24	347,32	334,53	335,77	368,4
Real Estate	269,61	273,21	292,98	309,75	327,4
Business Services	16,51	17,1	18,03	18,92	19,4
Public Administration, Defense, and Mandatory Social Security	564,89	598,54	598,64	614,1	654,1
Education Services	423,57	447,32	448,32	470,21	501,6
Health Services and Social Activities	123,5	127,22	130,9	139,62	145,7
Other Services	76,22	80,83	84,89	89,36	94,7
Gross Regional Domestic Product	18517,22	18840,59	20139,75	20622,67	21376,4

The GRDP data by business field for 2020–2024 shows consistent economic growth, where total GRDP increased from 18,517.22 to 21,376.4. This increase was driven by major sectors such as agriculture, mining, and manufacturing industry which remain the driving forces of the regional economy. The trade, construction, transportation, and information and communication sectors also recorded significant growth reflecting increased economic activity, digitalization, and investment. In addition, service sectors such as finance, education, health, and government also experienced increases, indicating strengthening of public services and community welfare. Overall, this data depicts strong post-pandemic economic recovery as well as transformation toward a more diverse and productive economic structure.

By understanding how the economic structure of Banggai Regency changed during that period, and by identifying emerging or strengthened leading sectors, local governments and stakeholders can design more targeted, effective and sustainable development strategies. This is in line with the idea that economic structural transformation is not only about quantitative growth, but also about increasing productivity, economic diversification and adding value (Cokro et al., 2025). However, while previous studies provide a foundational understanding of sectoral shifts and base sector identification, they exhibit limitations that this research aims to address. Existing literature, including Cokro et al. (2025), Imbran (2022), and Guna et al. (2023), primarily focuses on identifying what the leading or base sectors are through quantitative snapshots or trend analyses. A significant gap exists in critically examining the specific challenges and constraints these identified sectors face within a local context, which is crucial for translating analytical findings into actionable policy. For instance, knowing a sector has a high Location Quotient does not explain the infrastructural, regulatory, or market-access barriers that may be hindering its full growth potential. Furthermore, many studies conclude with generic recommendations for sectoral development without providing data-driven, context-specific solutions tailored to the unique socio-economic and geographic conditions of the region.

This research aims to explore more deeply the various challenges faced by leading sectors in Banggai Regency and provide data-based solutions that can help formulate more effective development policies. The main focus of this research is to identify leading sectors in Banggai Regency using the Location Quotient and

Shift-Share Analysis approaches, as well as to analyze factors that influence the performance of each of these sectors. In addition, this research is also intended to formulate policy recommendations to encourage growth in priority sectors and improve regional economic competitiveness. Through comprehensive analysis, this research is expected to make a meaningful contribution to the development of sustainable economic policies in Banggai Regency.

2. LITERATURE REVIEW

2.1. Regional Economic Development Theory

Development planning in autonomous regions makes it possible to improve regional economic development, especially focused on the development of underdeveloped economic regions and border areas that are widely scattered throughout the remote corners of Indonesia that were far from being touched by economic development during the centralization era. This must be a priority for government development with the aim of balancing the development of underdeveloped regions with regions that have developed more advanced (Kurniati et al., 2020).

2.2. Economic Growth

Economic growth is an increase in national income or production in a country from year to year. To measure economic growth in a country, it can be seen from the level of gross domestic product (GDP) of that country. Economic growth is one indicator of the success of a country's development. Recently, many countries have been trying to increase their economic growth rates by continuously increasing output through the availability of capital goods, technology and resources (Dwi & Pasaribu, 2023)

2.3. Economic Base Theory

Economic base theory can be defined as an increase in the growth of a region due to the existence of a dominant sector that drives regional economic growth. The dominant sector that drives economic growth is the base sector, this means that in the regional economy there are base and non-base sectors, where the sector that is endogenous (not free to grow) only depends on the influence of overall economic conditions (Firmansyah MF, 2021)

2.4. Economic Structure Change Theory

Economic structure can simply be interpreted as the role or contribution of sectors in the Indonesian economy to Indonesia's Gross Domestic Product (GDP). Economic structure can be interpreted as the composition of the respective roles of each sector in the economy both by business field and sectoral division into primary, secondary and tertiary sectors (Sara et al., 2024)

2.5. Previous Research

Cokro et al. (2025) used a quantitative approach with Location Quotient (LQ), Dynamic Location Quotient (DLQ), and Shift Share analyses on secondary GRDP data. The results show the Agriculture, Forestry, and Fisheries sector remains the dominant base sector across Central Sulawesi, with manufacturing and trade/services identified for future potential and a structural shift toward secondary and tertiary sectors in 8 of 13 regencies/cities. Imbran (2022) employed a quantitative approach using Location Quotient (LQ) and Shift Share Analysis (SSA) on secondary time-series data. The study found the primary sector remains dominant in Bone Bolango Regency, contributing an average of 42.60 percent annually, and identified ten base sectors, led by Mining and Quarrying and the Manufacturing Industry. Moreover, Guna et al. (2023) applied a descriptive quantitative method using location quotient, shift share, and overlay analyses on secondary GRDP time-series data. The study concluded the economic structure in Central Lombok Regency shifted from primary to tertiary (transportation) during 2011-2016, and then toward the secondary sector (construction) from 2017–2022 after the establishment of KEK Mandalika.

3. RESEARCH METHODS

3.1. Research Type

This type of research is descriptive, descriptive research is a method that functions to describe or give an overview of the object being studied through data or samples that have been collected as is, without conducting analysis and drawing general conclusions.

3.2. Data Sources

The data sources in this research are various sources obtained through secondary data in the form of GRDP data for Banggai Regency and GRDP for Central Sulawesi Province from 2020 to 2024. The data used in this research method was obtained from the Central Statistics Agency (BPS) of Banggai Regency and the Central Statistics Agency (BPS) of Central Sulawesi Province.

3.3. Location Quotient (LQ) Analysis

To determine potential sectors in Banggai Regency, the Location Quotient (LQ) analysis method is used. This method compares the magnitude of the role of a sector in a region to the magnitude of the role of that sector at the national level or at the regional level. This technique is used to identify internal potential owned by the region (Kuncoro, 2004). With the formula:

$$LQ = \frac{\frac{Si}{S}}{\frac{Ni}{N}}$$

Where:

Si   : GRDP value of sector i in Banggai Regency

S   : Total GRDP of Banggai Regency

Ni   : GRDP value of sector i in Central Sulawesi Province

N   : Total GRDP of Central Sulawesi Province

Based on the formula above, there are 3 possible LQ values found, namely:

1) LQ value in sector i = 1; meaning the contribution rate of sector i in Banggai Regency is the same as the contribution rate of sector i in Central Sulawesi Province.

2) LQ value in sector i > 1; meaning the contribution rate of sector i in Banggai Regency is greater compared to Central Sulawesi Province or base sector.

3) LQ value in sector i < 1; meaning the contribution rate of sector i in Banggai Regency is smaller compared to Central Sulawesi Province or non-base sector.

3.4. Growth Ratio Model (GRM) Analysis

The Growth Ratio (GR) Model is an analytical approach used to measure the growth rate of a variable over time or against a certain factor. Generally, this model is used to understand the relative change of an economic, social, or technical variable by comparing the value in the current period with the previous period (Zhang et al., 2026). The basic equation of this model is:

$$RNi = \frac{Ri}{Rn}$$

Where:

RNi   = National Growth Ratio

Ri   = Growth Rate of Sector i in the reference region (Province)

Rn   = Total Growth Rate of the reference region

3.5. Shift Share Analysis

Shift Share Analysis is an approach to evaluate the growth rate of various sectors in a region. This approach is used in analysis as a factor that causes changes in the industrial structure of a region as it grows over time (Asyafina & Muljaningsih, 2022). Shift Share Analysis is a technique for describing the impact of variables that drive growth in a region and how these variables relate to other regions is called shift (Robinson Tarigan, 2024). The equations used in shift share analysis are as follows:

1) Effect of provincial growth of sector i in Banggai Regency (national share): $N_{ij} = E_{ij} \times r_n$

2) Effect of industrial mix of sector i in Banggai Regency (proportional shift): $M_{ij} = E_{ij} (r_{in} - r_n)$

3) Effect of locational component of sector i in Banggai Regency (differential shift): $C_{ij} = E_{ij} (r_{ij} - r_{in})$

4) Growth of sector i in Banggai Regency: $D_{ij} = N_{ij} + M_{ij} + C_{ij}$

Notes:

i	= Economic sectors studied (17 sectors).
j	= Variable of the studied regency region (Banggai Regency).
n	= Variable of Central Sulawesi Province region.
E_{ij}	= GRDP in sector i of Banggai Regency
E_{in}	= GRDP in sector i of Central Sulawesi Province
r_{ij}	= Growth of sector i in Banggai Regency
r_{in}	= Growth of sector i in Central Sulawesi Province
r_n	= Economic growth of Central Sulawesi Province

4. RESULTS AND DISCUSSION

4.1. Research Results

4.1.1. Location Quotient (LQ) Calculation

Location Quotient aims to identify leading sectors and the direction of economic structure transformation in Banggai Regency, Location Quotient (LQ) analysis was conducted on 17 business field sectors based on Gross Regional Domestic Product (GRDP) data at constant prices for 2020-2024. This LQ analysis is used to identify base sectors (LQ > 1) that have comparative advantages and the potential to export their production outside the region, as well as non-base sectors (LQ < 1) that function to meet local economic needs. The LQ calculation results for each sector in Banggai Regency during the period 2020–2024 are presented in Table 2 below.

Table 2. Location Quotient (LQ) Calculation Results for Banggai Regency Year 2020-2024

No.	Business Field Sector	2020	2021	2022	2023	2024	LQ Average	Description
1	Agriculture, Forestry, and Fisheries	0,96	1,05	1,12	1,25	1,30	1,14	BASE
2	Mining and Quarrying	1,73	1,68	1,65	1,64	1,73	1,69	BASE
3	Manufacturing Industry	0,89	0,80	0,74	0,65	0,59	0,74	NON BASE
4	Electricity and Gas Procuremen	0,61	0,66	0,72	0,79	0,82	0,72	NON BASE
5	Water Supply, Waste Management, Sewerage, and Recycling	0,61	0,68	0,73	0,80	0,85	0,73	NON BASE
6	Construction	0,75	0,72	0,72	0,81	0,85	0,77	NON BASE
7	Wholesale and Retail Trade, Motor Vehicle and Motorcycle Repair	0,67	0,72	0,76	0,84	0,87	0,77	NON BASE
8	Transportation and Warehousing	0,91	1,04	1,02	1,11	1,16	1,05	BASE

9	Accommodation and Food Service Provision	0,80	0,89	0,94	1,02	1,06	0,94	NON BASE
10	Information and Communication	0,76	0,86	0,93	1,01	1,08	0,93	NON BASE
11	Financial Services and Insurance	0,93	1,01	1,06	1,15	1,20	1,07	BASE
12	Real Estate	1,02	1,11	1,18	1,27	1,36	1,19	BASE
13	Business Services	0,46	0,51	0,55	0,59	0,61	0,55	NON BASE
14	Public Administration, Defense, and Mandatory Social Security	0,63	0,69	0,75	0,82	0,88	0,75	NON BASE
15	Education Services	0,80	0,92	0,96	1,05	1,15	0,97	NON BASE
16	Health Services and Social Activities	0,54	0,58	0,63	0,70	0,74	0,64	NON BASE
17	Other Services	0,66	0,75	0,80	0,87	0,94	0,80	NON BASE

Based on the Location Quotient (LQ) calculation results for Banggai Regency during the period 2020–2024, it is known that there are five sectors that have an average LQ value greater than one (LQ > 1), namely the Agriculture, Forestry, and Fisheries sector (1.14), Mining and Quarrying (1.69), Transportation and Warehousing (1.05), Financial Services and Insurance (1.07), and Real Estate (1.19). These sectors are categorized as base sectors, meaning these sectors have comparative advantages and play a role as the main drivers of Banggai Regency's economy. The Mining and Quarrying sector is the sector with the highest average LQ value (1.69). This is in line with the real conditions of Banggai Regency which is one of the important natural resource producing areas in Central Sulawesi, especially oil and natural gas.

The presence of the Tangguh LNG Project and oil refinery in Luwuk makes a major contribution to the regional economy. However, the relatively constant stability of LQ values (ranging between 1.64–1.73) shows that this sector is experiencing stagnant growth, although it remains the main pillar of the regional economy. This dependence on the extractive sector shows the need for economic diversification so that regional development is more sustainable. The Agriculture, Forestry, and Fisheries sector with an average LQ value of 1.14 is also classified as a base sector showing significant increases from 2020 (0.96) to 1.30 in 2024. This increase reflects the success of local government programs in integrated agricultural development, increasing fisheries productivity, and strengthening plantation and food crop subsectors. This is important because most of the population of Banggai Regency still depends on this primary sector, especially in rural areas.

The Transportation and Warehousing sector (LQ 1.05) shows an important role in supporting the distribution of goods and services, especially for the mining, fisheries, and inter-regional trade sectors. The increase in LQ value from 0.91 (2020) to 1.16 (2024) indicates improvements in infrastructure and increased inter-regional connectivity, including sea and land transportation access to economic growth centers such as Luwuk and Toili. In addition, the Financial Services and Insurance sector (LQ 1.07) and Real Estate (LQ 1.19) also show strong performance. The growth of the financial sector illustrates increased public access to formal financial institutions, while the increase in the real estate sector reflects growing property investment and development of residential and commercial areas around Luwuk city center.

This trend shows a shift in Banggai Regency's economic structure from the primary sector toward the tertiary sector, although overall this transformation is still taking place gradually. Meanwhile, most other sectors such as Manufacturing Industry (LQ 0.74), Construction (0.77), and Wholesale and Retail Trade (0.77) are still classified as non-base. LQ values still below one indicate that these sectors are not yet able to compete regionally and still play a role in meeting domestic regional needs. However, several sectors such as Information and Communication (0.93) and Education Services (0.97) show trends of increasing LQ values each year, which means these sectors have the potential to become base sectors in the future.

4.1.2. Growth Ratio Model Calculation

Table 3 below summarized the growth ratio model analysis calculation results for Banggai Regency for the 2020-2024 period.

Table 3. Growth Ratio Model Analysis Calculation Results for Banggai Regency Year 2020-2024

Business Field	2020	2021	2022	2023	2024
Agriculture, Forestry, and Fisheries	0,50	1,13	1,77	0,53	10,72
Mining and Quarrying	7,62	-16,12	2,10	10,05	1,03
Manufacturing Industry	-2,20	-8,35	2,58	35,36	7,59
Electricity and Gas Procurement	0,61	1,08	0,93	0,99	1,40
Water Supply; Waste Management, Sewerage, and Recycling	0,19	0,67	1,00	0,93	1,02
Construction	0,64	4,80	4,97	0,34	1,36
Wholesale and Retail Trade; Motor Vehicle and Motorcycle Repair	0,99	1,24	1,40	0,80	1,61
Transportation and Warehousing	0,98	0,59	1,79	1,09	1,38
Accommodation and Food Service Provision	0,76	0,88	1,19	1,16	1,23
Information and Communication	1,11	0,72	0,78	1,18	0,80
Financial Services and Insurance	0,81	1,05	0,28	-0,05	1,18
Real Estate	12,67	1,80	1,23	1,41	0,82
Business Services	1,41	0,86	1,27	1,11	2,27
Public Administration, Defense, and Mandatory Social Security	0,12	0,99	-9,00	0,49	0,82
Education Services	0,59	0,14	15,09	1,19	0,58
Health Services and Social Activities	1,08	1,73	1,18	0,87	0,90
Other Services	-0,04	0,47	1,35	1,14	0,69
Gross Regional Domestic Product	-1,01	6,67	1,92	4,92	2,72

Based on the Growth Ratio Model (GRM) results for Banggai Regency for the period 2020–2024, it can be seen that the regional economic structure experienced fluctuations between sectors. In 2020, most sectors experienced contraction due to the COVID-19 pandemic, with the manufacturing industry down -2.20% and GRDP declining -1.01%. However, the mining and quarrying sector continued to grow positively at 7.62%, showing the important role of the extractive sector in supporting the regional economy during the crisis.

Entering the period 2021–2023, Banggai's economy began to recover, reflected by the increase in GRDP from 6.67% to 4.92%. This growth was mainly supported by the wholesale and retail trade, information and communication, and financial services and insurance sectors which grew stably. In addition, the education and government sectors also showed increased activity along with economic normalization. Nevertheless, the mining sector still fluctuated due to dependence on global commodity prices.

In 2024, GRDP growth reached 2.72%, with almost all sectors recording positive growth. The agriculture, forestry, and fisheries sector grew rapidly at 10.72%, while business services increased 2.27%. This condition shows a shift in Banggai's economic structure toward more sustainable diversification of service and agricultural sectors.

4.1.3. Shift Share Calculation

Table 4 below shows the results of shift share calculation for Banggai Regency 2020-2024

Table 4. Shift Share Analysis Calculation Results for Banggai Regency Year 2020-2024

No	Economic Sector	Nij (National Share)	Mij (Proportional Shift)	Cij (Differential Shift)	Dij (Nij+Mij+Cij)
1	Agriculture, Forestry, and Fisheries	434.62	22,754.94	-22,832.55	357.02
2	Mining and Quarrying	3,182.85	10,397.74	-12,692.38	888.22
3	Manufacturing Industry	5,983,56	21,892.94	-27,309.10	567.41

4	Electricity and Gas Procurement	1,34	35,67	-35,79	1,23
5	Water Supply; Waste Management, Sewerage, and Recycling	1,72	102.94	-102.68	1,99
6	Construction	431.24	8,841.45	-9,126.92	145.77
7	Wholesale and Retail Trade; Motor Vehicle and Motorcycle Repair	312.90	5,514.43	-5,576.68	250.66
8	Transportation and Warehousing	171.44	1,465.69	-1,502.28	134.86
9	Accommodation and Food Service Provision	25.36	241.70	-243.76	23,3
10	Information and Communication	138.90	2,994.10	-2,965.16	167.84
11	Financial Services and Insurance	73.07	1,721.58	-1,742.49	52,16
12	Real Estate	68.70	1,228.36	-1,239.27	57,79
13	Business Services	3,71	196.60	-197.42	2,89
14	Public Administration, Defense, and Mandatory Social Security	76.98	4,943.33	-4,931.10	89,21
15	Education Services	54.99	2,754.10	-2,731.06	78,03
16	Health Services and Social Activities	22.84	1,237.56	-1,238.20	22,2
17	Other Services	16.17	571.79	-569.48	18,48
	GRDP	10,784.19	86,907.80	-94,832.82	2,859.18

Based on the Shift Share analysis results for Banggai Regency for the year 2020–2024 in Table 2, a total change value (Dij) of Rp 2,859.18 billion was obtained. This positive value shows that in general Banggai Regency's economy experienced positive growth, although several sectors still show varying shifts. This Shift Share analysis provides an overview of factors that influence changes in sectoral output, namely national economic growth (Nij), industrial structure (Mij), and regional competitiveness (Cij). In general, the National Share (Nij) component of all sectors is positive. This means that all sectors in Banggai Regency received growth impact from national economic expansion, where Indonesia's economic growth in the period 2020–2024 relatively recovered post-COVID-19 pandemic.

The sector with the highest Nij contribution is Manufacturing Industry (Rp 5,983.56 billion), followed by Mining and Quarrying (Rp 3,182.85 billion). This condition shows that nationally, the industrial and mining sectors do have a large role in GDP, thus providing a fairly large growth effect on regions like Banggai Regency. However, in the Proportional Shift (Mij) component, most sectors have positive values but are followed by negative Differential Shift (Cij) values.

This phenomenon shows that although the national economic structure supports the growth of these sectors, the competitiveness of sectors in Banggai Regency is still relatively weak compared to other regions. For example, the Agriculture, Forestry, and Fisheries sector has a Mij value of Rp 22,754.94 billion, but its Cij is negative at Rp –22,832.55 billion. This means that although this sector grows nationally, its growth in Banggai is not as fast as comparison areas, possibly due to post-harvest infrastructure limitations, low commodity diversification, and fluctuations in agricultural and fisheries product prices.

A similar situation also occurs in the Mining and Quarrying sector, with a Mij value of Rp 10,397.74 billion and negative Cij of Rp –12,692.38 billion. The negative Cij value indicates that this sector experienced a regional competitiveness slowdown, although it still remains a base sector with high LQ (1.69). This condition can be caused by declining oil and gas production volumes and limited new investment in the mining sector,

as well as the shift in national policy toward clean energy. Sectors with positive and relatively high Dij (total change) values include: Agriculture, Forestry, and Fisheries (Rp 357.02 billion). Mining and Quarrying (Rp 888.22 billion). Manufacturing Industry (Rp 567.41 billion). Wholesale and Retail Trade (Rp 250.66 billion). Transportation and Warehousing (Rp 134.86 billion).

These sectors are the driving forces of Banggai Regency's economy, which show the ability to adapt to national economic changes and potential for strengthening the regional economy. Specifically for the Trade and Transportation sectors, the increase in Dij shows a multiplier effect from mining and industrial activities, especially in the distribution of goods and services to surrounding areas. Meanwhile, sectors such as Health Services, Business Services, and Electricity and Gas Procurement have small Dij values (below Rp 25 billion), indicating their contribution to regional economic growth is still limited. However, increased activity in these sectors remains important because they support social infrastructure development and public services, which are the foundation of transformation toward the tertiary sector.

Overall, Shift Share analysis results show that Banggai Regency's economic growth is still supported by traditional sectors such as agriculture and mining, while the competitiveness of industrial and service sectors still needs to be improved. Thus, regional economic development policy direction needs to be focused on economic diversification, increasing the added value of mining and agricultural products.

4.2. Discussion

4.2.1. Analysis of Economic Sector Contributions to GRDP

Based on the results of Location Quotient (LQ) and Shift Share analysis, the contribution of economic sectors to the Gross Regional Domestic Product (GRDP) of Banggai Regency shows structural dynamics that reflect the direction of regional economic transformation. During the period 2020–2024, economic sectors with LQ values > 1, namely Agriculture, Forestry, and Fisheries, Mining and Quarrying, Transportation and Warehousing, Financial Services and Insurance, and Real Estate, have dominant contributions to regional GRDP formation.

These sectors are base sectors that play a role as the main drivers of economic growth and sources of regional exports. Specifically, the Mining and Quarrying sector occupies a strategic position as the largest contributor to GRDP, supported by natural gas and oil and gas exploitation activities in the Batui and Toili areas. Nevertheless, Shift Share analysis results show negative Cij values in this sector, which indicates that Banggai Regency's sectoral growth has not been able to exceed the performance of the same sector at the provincial level.

This condition illustrates that the mining contribution to GRDP is high but not strongly competitive, or in other words still dependent on external factors such as global commodity prices. Meanwhile, the Agriculture, Forestry, and Fisheries sector has a significant role in absorbing labor and maintaining local economic resilience. The increase in LQ value from 0.96 in 2020 to 1.30 in 2024 shows that this sector is experiencing a strengthening of the economic base, although negative Cij values show growth that is not yet optimal compared to other regions (Kusumastuti *et al*., 2025). Thus, the agricultural sector remains the backbone of the rural economy, but requires innovation in downstream processing and production processing so that its contribution to GRDP can increase sustainably.

In addition to these two main sectors, the Transportation and Warehousing, Financial Services and Insurance, and Real Estate sectors show increasingly increasing contributions to the GRDP structure of Banggai Regency. LQ values greater than one and positive Dij values from Shift Share results indicate that these modern service sectors are beginning to become new economic growth engines, especially in urban areas such as Luwuk and its surroundings (Asngari, 2008)

This development is also in line with increased inter-regional trade activity and transportation infrastructure development that strengthens regional economic connectivity. Conversely, non-base sectors such as Manufacturing Industry, Construction, Education Services, and Health Services still make relatively small contributions to GRDP. LQ values < 1 and limited positive Dij show that these sectors are still in the early growth stage and require policy support to increase local productivity and added value. However, these sectors have a long-term strategic role, as they become the main pillars in building a more balanced economic structure between primary, secondary, and tertiary sectors.

Overall, the analysis results show that the largest contribution to Banggai Regency's GRDP still comes from the primary sector, especially mining and agriculture, but there is beginning to be a shift in contribution toward service and financial sectors. This indicates that Banggai's economic structure is in the early phase of transformation toward a more diversified and modern economy, in line with the direction of regional economic development in eastern Indonesia.

4.2.2. Growth Ratio Model

The results of Growth Ratio Model (GRM) analysis of Banggai Regency's economy for the period 2020-2024 show dynamic sectoral growth patterns and reflect the direction of regional economic transformation. Based on the data, the Agriculture, Forestry, and Fisheries sector experienced the highest growth in 2024 with a ratio of 10.72, confirming its role as the main leading sector post-pandemic. These results are consistent with findings by Hutajulu et al. (2025) in their study in Central Java, which stated that the agricultural sector has the greatest economic potential in accelerating regional development due to its linkages with industry and supporting service sectors. This supports the Economic Base Model theory which confirms that regional economic growth depends on base sectors capable of generating surpluses to drive other economic activities.

The Mining and Quarrying sector shows significant fluctuations sharp contraction in 2021 (-16.12) followed by growth surge up to 7.50 in 2024 which shows boom and bust cycle characteristics typical of extractive sectors. These fluctuations are influenced by external factors such as global commodity prices and export policies, as explained in research by Firmanto et al. (2025) that high dependence on global markets makes the mining sector very vulnerable to volatility. However, rapid recovery shows strong regional economic resilience, especially due to increased investment activity and mineral downstream policies that began to be effective since 2023.

Meanwhile, the Manufacturing Industry and Wholesale and Retail Trade sectors show stable growth, indicating a process of sustainable regional reindustrialization. This positive growth shows that Banggai Regency is beginning to transition from a natural resource-based economy toward a value-added economy. According to Qolby et al. (2025), increased investment and digitalization have a strong correlation with industrial efficiency and decreased Incremental Capital Output Ratio (ICOR), which in turn drives processing sector productivity. These findings confirm that innovation and digitalization-based regional development policies play an important role in strengthening local manufacturing sector competitiveness.

Overall, GRM results support classical economic sector growth theory as proposed by Rostow (2013) that regional development follows stages from primary to secondary and tertiary sectors. This shift is clearly seen in the increasing contribution of Financial Services, Real Estate, and Business Services sectors, which reflect economic diversification and strengthening of tertiary sector capacity. The academic implication of these findings confirms that GRM is effective in diagnosing sectoral potential and formulating regional development strategies. From a practical side, local governments can use these results as a basis for policy planning with focus on base sector diversification, agroindustry development, and improving human resource quality. Thus, Banggai Regency has great opportunities to strengthen sustainable regional economic competitiveness.

4.2.3. Transformation of Structure and Identification of Potential Economic Sectors

The results of combined analysis between Location Quotient (LQ) and Shift Share show that during the period 2020–2024, Banggai Regency's economic structure experienced a gradual shift from the primary sector toward the tertiary sector, although still dominated by natural resource-based activities. The Mining and Quarrying and Agriculture, Forestry, and Fisheries sectors remain the backbone of the regional economy, evidenced by LQ values > 1 and positive contributions to growth (positive Dij values in Shift Share analysis). These findings show that both sectors have comparative advantages and large contributions to GRDP, as stated by Kuncoro (2021) that sectors with LQ values > 1 reflect the regional economic base capable of driving regional growth. However, negative Differential Shift (Cij) values in almost all sectors show that Banggai Regency's sectoral competitiveness is generally still lagging behind the average of comparison regions at the provincial or national level. This condition is consistent with study results by Guna et al. (2023) which stated that natural resource-based regions tend to experience weak sectoral growth if not balanced by innovation and economic diversification.

This condition illustrates that Banggai's economy is still in the early stage of structural transformation. although growth in the agricultural and mining sectors is still dominant, there is beginning to be an increase in roles in service sectors such as Transportation and Warehousing, Financial Services and Insurance, and Real Estate, which each show LQ values > 1 and positive growth in Dij. This development is an indication that the regional economic pattern is beginning to move toward service sectors and productive investment. This is consistent with classical economic transformation theory proposed by Clark (1967) and Kuznets (1971). The shift dominated by the primary sector to the service sector is the main characteristic of economic transformation at the regional level. This transformation is also influenced by strategic infrastructure development, industrial area expansion, and increased private investment, especially around the Luwuk, Toili, and Batui areas. Increased inter-regional connectivity has strengthened the transportation and trade sectors, if not balanced by increased added value through the processing sector, then the transformation that occurs risks being pseudo (growth without structural change). Therefore, economic development strategies based on competitive advantages and sustainability are needed, among others through: Strengthening value-added agriculture and fisheries sectors, through downstream processing and diversification of local superior products development of the manufacturing industry sector to create stronger supply chains between primary and secondary sectors.

Increasing competitiveness of modern service sectors, especially transportation, finance, and real estate, which have long-term growth potential. Investment in infrastructure and human resources, to accelerate the shift of labor from the primary sector to secondary and tertiary sectors (Mahardika et al., 2024). Thus, it can be concluded that the transformation of Banggai Regency's economic structure is beginning to show a positive direction toward diversification and economic modernization, but still requires consistent policy intervention so that the resulting growth is more equitable, sustainable, and competitive.

5. CONCLUSIONS

Based on the analysis of Banggai Regency's economy from 2020–2024, it is concluded that its economic structure is gradually shifting from the primary toward the tertiary sector, though it remains dominated by natural resource-based activities. The LQ analysis identifies five base sectors: Agriculture, Forestry, and Fisheries; Mining and Quarrying; Transportation and Warehousing; Financial Services and Insurance; and Real Estate, with mining providing the largest GRDP contribution and agriculture remaining the primary employer. Shift Share analysis indicates weak overall sectoral competitiveness, yet shows positive growth potential in agriculture, mining, manufacturing, trade, and transportation. The ongoing transformation reflects a move toward diversification, yet faces challenges from high mining dependence and low processing value. Consequently, future development strategies should focus on leveraging competitive advantages, strengthening downstream processing, expanding manufacturing and modern services, and investing in infrastructure and human resources through enhanced collaboration among government, industry, and educational institutions to achieve sustainable and inclusive growth.

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