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Research Article

## Analysis of Economic Sector Potential using the LQ and Shift Share Method in Batu Bara Regency for the 2019-2023 Period

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Location Quotient  
Shift Share,  
Base Sector

### Abstract

This study aims to analyze the economic sector potential in Batu Bara Regency for the period 2019-2023 using the Location Quotient (LQ) and Shift Share Analysis (SSA) methods. The main objective is to identify key base and non-base sectors that significantly contribute to regional economic growth and to understand the dynamics of structural changes in the economy. The results indicate that sectors such as agriculture, forestry, fisheries, manufacturing, construction, and trade are base sectors with dominant contributions to the local economy, while the mining and financial services sectors are categorized as non-base sectors that have shown limited development. The SSA analysis reveals that the agriculture sector holds a significant competitive advantage, while other sectors face challenges in competitiveness at the provincial and national levels. Based on these findings, it is recommended that the local government prioritize the development of base sectors through policies that support productivity, innovation, and market expansion, in order to foster sustainable economic growth.

### Introduction

One of the main priorities for improving community welfare is by increasing regional economic development. According to (Pramono et al., 2024), one indicator of the success of regional economic development is a high level of work energy absorption. Every country, including Indonesia, has a development program to improve the level of the national economy. Regional development is national development in a region by adjusting the economic capabilities of a region by (Akhmad, G.R., & Sarjanti, 2024). However, the accumulation of economic achievements at the sectoral and regional levels is also a development achievement at the macro or national level (Muljanto, 2021). Economic growth is a key indicator in assessing the real economic performance of a region. Economic growth is a key indicator in assessing the real economic performance of a region.

Batu Bara Regency is one of the areas in North Sumatra Province that has economic potential that needs to be developed to improve community welfare. Batu Bara Regency's economy is dominated by several key sectors, such as agriculture, industry and mining. However, identification of basic sectors that have comparative

advantages and analysis of the dynamics of sectoral change need to be carried out to ensure a more effective and efficient direction of economic development.

In identifying the economic potential of a region, the Location Quotient (LQ) and Shift Share Analysis (SSA) methods are often used. LQ is used to measure the degree of specialization of a sector compared to the same sector at the provincial or national level, so that it can determine whether the sector is a base or non-base sector. Research conducted by (Akhmad, G. R., & Sarjanti, 2024) shows that LQ is an effective analytical tool for identifying leading sectors in developing regions, such as Tegal Regency, by measuring the role of sectors in regional income and their contribution to the economy. In addition, the Dynamic Location Quotient (DLQ) method can be used to see shifts in sectoral advantages over time, providing a more dynamic picture of regional economic development prospects.

The Shift Share method is also useful in evaluating changes in economic structure over time by analyzing the contribution of national factors, industrial structure, and regional competitive advantages. According to research conducted by (Pramono et al., 2024) in Ketapang Regency, West Kalimantan, Shift Share analysis provides clear insight into sectors that contribute greatly to absorbing labor and supporting local economic development. The results show that the agriculture, forestry, fisheries and mining sectors have great potential, but still face competitive challenges at the provincial level.

In Batu Bara Regency, which is strategically located on the east coast of North Sumatra, economic sectors face challenges such as fluctuations in commodity prices, changes in national policies, and competition with neighboring regions. Therefore, LQ and Shift Share analysis needs to be carried out to determine the basic sectors that have comparative advantages and evaluate the impact of structural changes on the regional economy during the 2019-2023 period.

This research aims to (1) identify base and non-base sectors in Batu Bara Regency using the LQ method; (2) analyzing changes in regional economic structure using the Shift Share method; and (3) provide appropriate development policy recommendations based on the findings from the two methods. Thus, it is hoped that this research can make a significant contribution to more inclusive and sustainable regional development planning in Batu Bara Regency.

In addition, this research will also consider specific aspects of the Batu Bara Regency economy, such as dependence on the agricultural and mining sectors, as well as how changes in national and international policies can affect the regional economic structure. It is hoped that the results of this research can become a reference for local governments and other stakeholders in formulating economic development policies that focus on sectors that have great potential for development.

## **Hypotheses Development**

### **1. Regional Economic Growth**

Economic growth is the process of continuously changing a country's economic conditions towards better conditions over a certain period of time (Purnomo et al., 2023). The higher the economic growth, the higher the welfare of society. The policy taken by the government in an effort to succeed in economic development is to carry out regional development with the aim of realizing the welfare of a country's regions equally.

Regional economic growth is a process that reflects an increase in a region's capacity to produce goods and services, which is measured through indicators such as Gross Regional Domestic Product (GRDP). GRDP reflects the performance of economic sectors in a region. Therefore, analysis of leading sectors in the regional economy is important to encourage equitable and sustainable development, as shown by Lismiana et al. (2023) in their research in South Sumatra Province.

### **2. Location Quotient (LQ) Method**

Location Quotient (LQ) is a method used to measure the specialization of economic sectors in a region compared to a wider region, such as a province or nationally. Lismiana et al. (2023) explained that LQ helps identify basic sectors that have the potential to become the main driver of the regional economy. Sectors with

an LQ value of more than 1 are considered base sectors, while sectors with an LQ value below 1 are non-base sectors.

Research conducted by Pramono et al. (2023) in Ketapang Regency found that the agriculture, forestry and fisheries sectors had an LQ value of more than 1, which means these sectors play an important role in the regional economy. Apart from that, Hatta (2020) stated that the mining sector in South Sumatra has a high LQ value, making it a significant base sector.

### 3. Shift Share Analysis (SSA)

Shift Share Analysis (SSA) is an analytical method used to dissect economic changes in a region into three components: National Growth Effect (influence of national growth), Industrial Mix Effect (influence of industrial structure), and Regional Shift Effect (influence of regional competitiveness). Hatta (2020) uses LQ and Shift Share analysis which produces 5 (five) superior categories in South Sumatra Province. Haidir (2021) uses LQ and Shift Share analysis which produces 7 (seven) basic categories in Ogan Ilir Regency, South Sumatra Province. Research by Suparta et al. (2022) using LQ and Shift Share analysis resulted that there are 5 (five) superior categories in South Sumatra Province. According to Suparta et al. (2022), SSA is useful for identifying whether economic growth in a region is more influenced by national conditions or local competitiveness. A similar thing was also found by Abdurrahman et al. (2023) in Jambi Province, where SSA was used to analyze development inequality and found that the mining sector has strong competitiveness in the region.

### 4. Basic Economic Theory

Basic Economic Theory states that the economic growth of a region is highly dependent on basic sectors, which produce goods and services to be exported outside the region. These basic sectors are the main drivers of the regional economy because they generate income that can be used to finance the development of non-basic sectors (Abdurrahman et al., 2023).

Research conducted by Hatta (2020) shows that the agricultural and mining sectors in South Sumatra are very important basic sectors in supporting post-pandemic economic growth. Apart from that, Lismiana et al. (2023) found that the agricultural sector in South Sumatra shows great potential as a basic sector that can be further developed to increase the regional economic competitiveness

#### Method

To obtain potential economic sectors in Batubara Regency, Location Quotient (LQ) analysis and Shift Share analysis are needed to determine base and non-base sectors in the economy.

#### Location Quotient (LQ) Analysis

Location Quotient analysis is used because it has the advantage of being a simple analytical tool that can show the economic structure of a region and potential import substitution industries or products that can be developed for export and shows potential industries for further analysis. The Location Quotient analysis tool is intended to identify and formulate the composition and shifts in the basic sectors of a region using Gross Regional Domestic Product (GRDP) data as an indicator of regional growth.

This analysis is used to determine the basic commodities in each sub-district in the research area. The analysis technique used is Location Quotient (LQ), which is a comparison between the magnitude of the role of the commodity nationally or in a wider region so as to obtain the relative degree of specialization of a commodity. Systematically the LQ calculation is stated as follows:

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

Information:

LQ = Location Quotient Value

- Si = GDP sector i in Batu Bara Regency
- S = Total GRDP in Batu Bara Regency
- Ni = GDP sector i in North Sumatra Province
- N = Total GRDP in North Sumatra Province

**Interpretation of Results**

LQ > 1 : Sector i is a basic sector, showing potential for further development.

LQ = 1: Sector i is in a balanced position, there is no competitive advantage.

LQ < 1 : Sector i is not a basic sector, indicating a lack of potential for development.

This method assumes that demand patterns in all regions are identical to regional or national demand patterns. that employee productivity in national industry is the same as employee productivity in regional industry. The country's economy is a closed economy because each industry produces the same products in each sector. One of the advantages of LQ Analysis is that it is a simple analytical tool that can show the structure of a country's economy as well as import substitution industries or products that can be developed for export—as well as potential industries (sectoral) for further analysis. Disadvantages include that it is only a conclusion temporary and is only a rough, descriptive indicator. It also does not take into account the economic structure of each region. This is because not only production results and labor productivity are different in each region, but also the resources that can be utilized in each region.

Apart from that, LQ analysis is used to calculate the potential for superior products from the use of natural resources in various sectors of agriculture, plantations, fisheries, animal husbandry, forestry and tourism. We can find out which regions are most suitable for certain products, so that they can be designated as base or non-base regions or areas.

**Shift Share**

Analysis Shift Share is an analytical method used to evaluate the growth of a region's economic sector compared to the growth of the economic sector at the provincial or national level. Komponen Shift Share

1. National Growth (PN):

Measuring the growth of sector i in Batu Bara Regency due to national growth.

Calculated by the formula:

$$PN_i = Ni \times \left( \frac{Nt - Nt-1}{Nt-1} \right)$$

Information:

N<sub>t</sub> = Total GDP in year t

N<sub>t-1</sub> = Total GDP for the previous year

1. Industrial Mix (BM)

Measuring the contribution of the mix to changes in GRDP

Calculated by the formula:

$$BM_i = Si \times \left( \frac{St - St-1}{St-1} \right)$$

2. Competitive Advantage (KK):

Measuring the competitive advantage of sector i in Batu Bara Regency.

Calculated by the formula:

$$KK_i = S_i - PN_i - BM_i$$

The results of the Shift Share analysis provide information about:

Positive Growth: If the KK value is positive, the sector has a competitive advantage.

Negative Growth: If the KK value is negative, the sector experiences a decline in competitiveness.

The data that has been collected will be analyzed using Excel software to simplify LQ and Shift Share calculations. The analysis results will be presented in tabular form to provide clear visualization

## Results And Discussion

### Result

**Table 1**  
**Hasil Anlisis LQ**

No	Sektor	Rata-Rata	Ket
1	Agriculture, Forestry and Fisheries	141,9262961	Base
2	Mining and Quarrying	0,552389992	Non Base
3	Processing industry	12,11011382	Base
4	Procurement of Electricity and Gas	2,158692262	Base
5	Water Supply, Waste Management, Waste and Recycling	1,593430765	
6	Construction	93,14050045	Base
7	Wholesale and Retail Trade; Car and Motorcycle Repair	4,652926301	Base
8	Transportation and Warehousing	3,48256829	Base
9	Provision of accommodation and food and drink	2,533401635	Base
10	Information and Communication	1,068463334	Base
11	Financial Services and Insurance	0,508627068	Non Base
12	Real Estate	1,254454438	Base
13	Company Services	0,502809696	Non Base
14	Government Administration, Defense and Mandatory Social Security	2,652735332	Base
15	Education Services	1,147391107	Base
16	Health Services and Social Activities	1,534762213	Base
17	Other Services	0,845118346	Non Base

Source: Data processed (2024)

Based on the Location Quotient (LQ) test results shown in the table, it can be identified that most of the economic sectors in the region fall into the basic sector category. Basic sectors have an LQ value of more than 1, which shows that these sectors are more dominant than the national average and have export potential, so they play an important role in regional economic growth. Some of the most prominent basic sectors are Agriculture, Forestry and Fisheries with an LQ of 141.93, which shows that this sector is very dominant and is the main support for the regional economy. Apart from that, the Construction sector is also very significant with an LQ value of 93.14, which indicates very active development activity. The Manufacturing Industry Sector with an LQ of 12.11 also plays a big role, showing the region's strength in the manufacturing industry.

Apart from that, other sectors such as Electricity and Gas Procurement, Wholesale and Retail Trade, Transportation and Warehousing, and Accommodation and Food and Drink Provision are also classified as important basic sectors, although with lower LQ values. These sectors show good economic potential, especially in supporting trade activities, logistics services and tourism. Likewise with the Real Estate,

Information and Communication, Education Services and Health Services sectors, which, although their contribution is not as large as other main sectors, still play an important role in the regional economy.

On the other hand, there are several non-based sectors that have an LQ value of less than 1, indicating that these sectors are underdeveloped and only function to meet local needs. Examples of non-based sectors are Mining and Quarrying with an LQ of 0.55, and Financial Services and Insurance with an LQ of 0.51. These two sectors do not play a significant role in exports or regional economic growth. The Corporate Services and Other Services sectors are also relatively weak in their contribution to the regional economy.

Overall, the region's economy is dominated by sectors based on natural resources, processing industry and services that support people's lives and trade, while sectors such as mining and financial services are still not well developed in this region. The shift share analysis table above provides an overview of the performance of economic sectors in the context of changes in the workforce and economic contribution in certain regions. Based on the indicators KPN (National Growth Employment), KPP (Provincial Growth Employment), KPPW (Regional Growth Employment), and SSA (Shift Share Analysis), sectors that have experienced positive and negative changes can be identified.

The Agriculture, Forestry and Fisheries sectors show interesting results, with negative KPN (-0.98) indicating a decline at the national level, but this sector remains superior at the provincial and regional levels (KPP and KPPW = 1.48). This is reflected in the high SSA value, namely 1.98, indicating the positive contribution of this sector to the regional economy. The Mining and Quarrying sector also shows a positive KPN (0.21), but the KPP and KPPW values are slightly negative, which means this sector is growing stronger at the national level than at the provincial or regional level.

The Processing Industry experienced employment growth at the national level (KPN = 0.27), but a decline at the provincial and regional levels (KPP and KPPW = -0.04), but still made a positive contribution in the SSA analysis (0.18). Electricity and Gas Procurement experienced positive growth in all indicators, although slightly at the provincial and regional levels, but its contribution remained positive with SSA of 0.21.

Several sectors such as Water Supply, Waste Management, Waste, and Recycling and Construction show mixed growth. The Water Supply sector experienced a decline at the provincial and regional levels, with a negative SSA (-0.01), which indicates that this sector is experiencing contraction. In contrast, the Construction sector has a positive KPN value but has experienced a decline at the provincial and regional levels, although SSA still shows a positive contribution of 0.04.

Service sectors such as Wholesale and Retail Trade, Transportation and Warehousing, Information and Communication, and Financial Services show interesting variations. Wholesale and Retail Trade experienced positive growth at all levels, with an SSA of 0.36, indicating the sector is growing rapidly. Meanwhile, the Transportation and Warehousing sector experienced a decline at the provincial and regional levels even though the KPN value was still positive. Information and Communication experienced strong growth with an SSA of 0.31, indicating that this sector is an important contributor to the regional economy.

The Education Services and Health Services sectors also made a positive contribution even though there was a decline at the provincial and regional levels. Education Services has a positive SSA of 0.05, while Health Services is stronger with an SSA of 0.23, indicating the importance of this sector in supporting the local economy.

Overall, this table illustrates that key sectors such as Agriculture, Trade, Information and Communication, and Health Services make significant contributions to the regional economy. Meanwhile, several other sectors, such as Water Supply and Construction, show challenges in employment growth at the provincial and regional levels, although there are still positive contributions at the national level.

## **Discussion**

The discussion of the results of Location Quotient (LQ) and Shift Share data analysis can be linked to several regional economic theories, especially related to the concepts of base and non-base sectors and regional economic growth.

Firstly, from the LQ data it can be seen that sectors such as Agriculture, Forestry and Fisheries, Processing Industry and Construction are basic sectors, because the LQ value is greater than 1. This shows that these sectors have greater concentration. large in the region compared to the national average, which means they play an important role in creating surpluses that can be exported to other regions. This is in accordance with basic sector theory, which states that sectors that produce output for markets outside the region are the main drivers of local economic growth. In this context, the agricultural sector appears to be very dominant, which supports the view that natural resource-based regions will be highly dependent on primary sectors such as agriculture.

Second, from the Shift Share analysis, it can be seen that sectors such as Agriculture, Forestry and Fisheries have very positive SSA values, which indicates that these sectors are growing faster than the same sectors at the national level. This shows the existence of local competitive advantages in the agricultural sector. Regional economic growth theory also emphasizes that the advantages of certain sectors that grow faster in the local area compared to the national level will have a positive impact on regional economic development. In addition, the Manufacturing Industry and Trade sectors also showed positive contributions through SSA, indicating that these sectors have the potential to become sectors that drive local growth, by increasing production and consumption of more value-added goods in the region.

In contrast, several sectors such as Water Supply, Waste Management, Waste and Recycling and Financial Services and Insurance have negative SSA, indicating that these sectors are less developed than the national average. These sectors can be categorized as non-based sectors, where their role is more focused on meeting local domestic needs without generating a surplus for export. According to non-based sector theory, these sectors have an important role in meeting the internal needs of a region, but do not make a significant contribution to economic growth in terms of exports or economic surplus.

Overall, the LQ and Shift Share analysis shows that regional economic growth is strongly influenced by basic sectors such as agriculture and industry, which play a role in increasing regional competitiveness and generating economic surpluses. Meanwhile, the non-based sector remains important to maintain the balance of the region's domestic needs.

## **Conclusion**

Based on the results of the analysis of the potential of the economic sector in Batu Bara Regency using the Location Quotient (LQ) and Shift Share methods during the 2019-2023 period, it can be concluded that the sectors that have great potential in driving economic growth in this region are Agriculture, Forestry and Fisheries, Processing Industry, as well as Construction. These sectors are proven to be basic sectors with high LQ values and positive contributions to local economic growth based on Shift Share results. This shows that these sectors have strong competitive advantages and play an important role in creating economic surpluses that can be exported to other regions, in line with regional economic theory regarding the importance of base sectors in regional growth. The implication is that local governments and stakeholders need to pay more attention to the development of these basic sectors through policies that support increased productivity, technological innovation and market expansion. That way, the potential of these leading sectors can be maximized to create sustainable economic growth in Batu Bara Regency. In addition, non-basic sectors such as Water Supply, Waste Management, Waste and Recycling, which show slower growth, still require policy support that focuses on increasing efficiency and service quality to meet domestic needs. For further research, it is recommended to carry out a more in-depth analysis by considering external factors such as changes in national policies, global market conditions, and infrastructure developments which can influence the growth of economic sectors in the region. Further research could also expand the scope by including more detailed sectoral analysis and involving social and environmental aspects in order to obtain a more comprehensive picture of the dynamics of economic development in Batu Bara Regency.

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