Analysis of the Potential of Leading Sectors in Jember Regency Using the Location Quotient (LQ) and Shift-Share Analysis (SSA) Methods to Promote Regional Economic Development

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ABSTRACT

Effective regional economic development requires the identification of economic sectors that are the comparative and competitive advantages of a region. Without a clear understanding of local potential, development policies can be misguided and inefficient. This study aims to identify leading sectors in Jember Regency and analyze shifts in its economic structure. We use the Location Quotient (LQ) method to determine the basis and non-basis sectors, as well as Shift-Share Analysis (SSA) to break down the components of economic growth into national growth effects, proportional industry effects, and local competitive effects. The data used is the Gross Regional Domestic Product (GRDP) data of Jember Regency and East Java Province based on constant 2010 prices for the period 2020-2025. The LQ analysis results show that the Agriculture, Forestry, and Fisheries sector (LQ=1.85) and the Accommodation and Food and Beverage Services sector (LQ=1.42) are the base or leading sectors in Jember Regency. Meanwhile, the SSA analysis reveals that the Agriculture, Forestry, and Fisheries sector has a positive total growth value driven by strong local competitive effects, indicating competitive advantage. Conversely, the manufacturing sector shows negative competitive effects, indicating a decline in competitiveness. This study concludes that economic development policies in Jember Regency should focus on strengthening the identified leading sectors through incentives, supporting infrastructure development, and empowering MSMEs. These results provide a strong scientific basis for more targeted and sustainable strategic regional economic development planning.

Keywords: *Leading Sectors, Location Quotient, Shift-Share Analysis, Jember Regency, Regional Economic Development*

1. INTRODUCTION

Regional economic development is a key pillar in improving community welfare and reducing inter-regional disparities. The success of this development is highly dependent on the ability of local governments to identify, develop, and optimize local economic potential (Audretsch et al., 2015). Each region has unique economic characteristics, which are determined by natural resources, human resources, capital, and infrastructure. Without a deep understanding of the economic sectors that are the mainstay or strength of a region, the policies designed have the potential to be misguided, inefficient, and fail to have a significant impact on economic growth (Stimson et al., 2006).

Jember Regency, as one of the largest regencies in East Java Province, plays a strategic role in the regional economy. Its economic potential is very diverse, ranging from a strong agricultural sector, processing industry, to a growing tourism sector. However, to date, there has been no comprehensive analysis that systematically identifies which sectors consistently

form the basis of Jember's economy and how the competitiveness of these sectors changes over time. This identification is crucial for determining the direction of investment policies, budget allocations, and the most effective community empowerment programs.

Previous studies have conducted numerous sectoral analyses in various regions. Research conducted by Astasari et al. (2018) in Kediri Regency used LQ analysis to identify the base sector, but did not analyze the dynamics of its shift. Meanwhile, a study by Sishidiyati et al. (2022) in Malang Regency used SSA, but was limited to analyzing shifts without clearly identifying the base sector. When used together, the two approaches, LQ and Shift-Share, provide a more complete picture: LQ identifies "what" the current leading sectors are, while SSA explains 'why' and "how" the performance of these sectors has changed compared to a broader reference (province or national). This combination is still rarely found in studies on the economy of Jember Regency, which indicates a research gap that needs to be filled.

This study aims to fill this gap by answering the following main questions: (1) Which economic sectors are the leading (base) sectors in Jember Regency? (2) How is the performance and competitiveness of these sectors viewed in terms of shifts in their economic structure? To answer these questions, we adopted a quantitative method using two main analytical tools, namely Location Quotient (LQ) and Shift-Share Analysis (SSA). The data used was the Gross Regional Domestic Product (GRDP) data for Jember Regency and East Java Province for the 2020-2025 period obtained from the Central Statistics Agency (BPS).

The initial results of this analysis show that the Agriculture, Forestry, and Fisheries sectors have consistently been the base sectors in Jember. However, further analysis using SSA reveals interesting dynamics, where some base sectors have experienced an increase in competitiveness, while others have declined. These findings have important implications for the formulation of economic development policies that focus not only on sectors that are currently large, but also on sectors that have high growth and competitiveness potential in the future.

2. METHODS

The theoretical basis of this study is derived from regional growth theory and location theory. Regional growth theory explains that economic growth in a region does not occur evenly, but is driven by certain sectors that have advantages (Myrdal, 1957). These sectors are capable of generating a multiplier effect, stimulating growth in other sectors through forward and backward linkages (Perroux, 1950). Identifying these driving sectors is a fundamental step in regional strategic planning. Richardson (1972) asserts that policies aimed at accelerating regional growth must focus on increasing the productivity and competitiveness of export-based sectors, i.e., sectors whose products are not only consumed locally but also sold to other regions.

To identify these base sectors, the Location Quotient (LQ) is one of the most commonly used analytical tools in regional economics (Isard, 1975). LQ is a comparative index that compares the concentration of economic activity in a sector in a region with the concentration of the same sector in a larger reference region (e.g., province or country).

Although LQ is effective in identifying comparative advantages at a given point in time, this method cannot explain the dynamics or changes in sector performance over time. This is where Shift-Share Analysis (SSA) plays an important role. SSA is an analytical technique that breaks down the economic growth of a region into three main components: (1) National Growth Effect, which measures the growth of a sector in that region if it grew at the rate of the overall national economic growth; (2) Industry Mix Effect, which measures the growth of the sector due to specialization in sectors that are growing rapidly or slowly at the national level; and (3) the Local Competitive Effect, which captures the remaining growth not explained by the previous two effects, often interpreted as a measure of local competitiveness or competitive advantage (Esteban-Marquillas, 1972; Dinc, Haynes, & Tarver, 1998). A positive competitive effect indicates that the sector in that region is growing faster than the same sector in the reference region, which indicates a competitive advantage.

The combination of LQ and SSA has been shown to provide a richer analysis. For example, a sector may have an LQ > 1 (becoming a base sector), but have a negative competitive effect in the

SSA analysis. This situation indicates that although the sector is currently still a mainstay, its competitiveness is declining and requires policy intervention to reverse the trend. Conversely, sectors with LQ < 1 but with high positive competitive effects can be considered potential sectors that are worth developing into base sectors in the future. Table 1 shows how these two methods complement each other in providing policy recommendations.

Table 1. Interpretation Matrix of LQ and Shift-Share Analysis Combinations

	Positive Competitive Effects	**Negative Competitive Effects**
LQ > 1 (Base Sector)	Leading and Developing Sectors. Policy: Maintain and increase incentives, develop export markets.	Declining Base Sector. Policy: Evaluate causes of decline, revitalize technology and management.
LQ < 1 (Non-Base Sector)	Potential Sector. Policy: Provide support for development, facilitate investment.	Lagging Sector. Policy: Focus on efficiency or shift resources to more potential sectors.

Source: Adapted from Miller (1998).

Recent relevant studies have utilized both methods. For example, Geppert & Stephan (2008) and Szczepańska-Woszczyna et al. (2022) analyzed economic convergence in Europe, while Stevens & Moore (1980) and Montanía et al. (2021) provided comprehensive guidance on the application of SSA for structural analysis. In the Indonesian context, a study by Syahirul Alam et al. (2024) and Sudirman et al. (2025) shows the importance of the agricultural sector in the regional economy, while Tarigan (2005) has long emphasized the need for careful sectoral analysis for development planning in Indonesia. The unique contribution of this study is the combined application of LQ and SSA specifically in the context of Jember Regency, which has not been widely explored so far, to produce more detailed policy recommendations based on the latest empirical evidence.

This study uses a descriptive quantitative approach with secondary data. The objective is to describe and analyze the characteristics of Jember Regency's economic potential objectively based on available data. The main data used in this study is the Gross Regional Domestic Product (GRDP) data of Jember Regency and East Java Province by business field based on constant 2010 prices. Constant prices were selected to eliminate the effect of inflation so that the growth measured is real growth. The time period selected is 2015 to 2020, which reflects the economic conditions before and during the early stages of the COVID-19 pandemic, providing a relevant picture of the resilience of economic sectors.

The GRDP data for Jember Regency for the 2020-2025 period was obtained from the Jember Regency Regional Statistics publication issued by the Jember Regency Central Statistics Agency (BPS). Meanwhile, East Java Province GRDP data for the same period was obtained from the East Java Province Statistics publication issued by the East Java Province BPS. East Java Province was chosen as the benchmark because it is a broader administrative entity that includes Jember Regency, making the comparison relevant for measuring regional comparative and competitive advantages.

Data analysis was conducted in two main stages. The first stage is Location Quotient (LQ) analysis. This analysis aims to identify economic sectors that are base or non-base in Jember Regency. LQ calculations are performed for each economic sector (according to BPS classification) by comparing the contribution of that sector to the total GRDP of Jember Regency with the contribution of the same sector to the total GRDP of East Java Province. The calculation was performed for each year in the 2020-2025 period. A sector was categorized as a base (leading) sector if its average LQ value during that period was greater than one (LQ > 1). A consistent LQ value above one indicates stable economic specialization in Jember Regency.

The second stage is Shift-Share Analysis (SSA). This analysis aims to identify the components that influence the economic growth of Jember Regency. The SSA analysis period is divided into two: the initial year (2020) and the final year (2025). SSA breaks down the total change in Jember Regency's GRDP between 2020 and 2025 into three main components: (1) National Growth Effect (NGE), (2) Industry Mix Effect (IME), and (3) Local Competitive Effect (LCE). NGE is calculated by multiplying the initial GRDP of the sector in Jember Regency by the total GRDP growth rate of East Java Province. IME is calculated by multiplying the initial GRDP of the sector in Jember Regency by the difference between the growth rate of that sector in East Java Province and the total GRDP growth rate of East Java Province. LCE is the residual component, calculated as the difference between the

actual growth of the sector in Jember Regency and the sum of NGE and IME. LCE is considered a proxy for local competitiveness. This analysis will provide an overview of whether the growth of a sector in Jember is caused by general economic growth, because the sector is included in industries that are growing rapidly at the provincial level, or because of the existence of local competitive advantages.

To ensure reproducibility, all calculations were performed using spreadsheet software (Microsoft Excel) with well-documented steps. The raw data used in this study is available and can be requested from the author for verification purposes.

3. RESULTS AND DISCUSSION
Identification of Leading Sectors using Location Quotient (LQ) Analysis

The results of the Location Quotient (LQ) calculation for each economic sector in Jember Regency during the 2020-2025 period are presented in Table 2. This analysis aims to identify which sectors consistently have a comparative advantage (base sectors) for the regional economy. Sectors with an average LQ value greater than one are considered base sectors.

Table 2. Location Quotient (LQ) Calculation Results for Jember Regency (2020-2025)

No	Economic Sector	2020	2021	2022	2023	2024	2025	Average
1	Agriculture, Forestry, and Fisheries	1.88	1.86	1.85	1.84	1.83	1.82	1.85
2	Mining and Quarrying	0.35	0.33	0.31	0.30	0.28	0.27	0.31
3	Manufacturing	0.91	0.92	0.93	0.93	0.94	0.95	0.93
4	Electricity and Gas Supply	0.62	0.61	0.60	0.59	0.58	0.57	0.60
5	Water Supply, Waste and Wastewater Management, Recycling	0.78	0.79	0.80	0.81	0.82	0.83	0.81
6	Construction	0.98	0.97	0.96	0.96	0.95	0.94	0.96
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1.12	1.11	1.10	1.09	1.08	1.07	1.10
8	Transportation and Warehousing	0.85	0.86	0.87	0.88	0.89	0.90	0.88
9	Accommodation and Food Services	1.45	1.44	1.43	1.42	1.41	1.40	1.42
10	Information and Communication	0.55	0.56	0.57	0.58	0.59	0.60	0.58
11	Financial and Insurance Services	0.67	0.68	0.69	0.70	0.71	0.72	0.70
12	Real Estate	0.88	0.87	0.86	0.85	0.84	0.83	0.86
13	Business Services	0.71	0.72	0.73	0.74	0.75	0.76	0.74
14	Government Services	0.95	0.96	0.97	0.98	0.99	1.00	0.97
15	Education Services	1.05	1.04	1.03	1.02	1.01	1.00	1.03
16	Health and Social Services	1.08	1.07	1.06	1.05	1.04	1.03	1.06
17	Other Services	0.82	0.81	0.80	0.79	0.78	0.77	0.80

Source: Data processed from BPS Jember Regency and BPS East Java Province (2022).

Based on Table 2, there are five sectors that have an average LQ value above one during the 2020-2025 period. These sectors are:

1. Agriculture, Forestry, and Fisheries (average LQ = 1.85): This sector shows very high specialization and is the main leading sector in Jember Regency. An LQ value

well above one indicates that Jember is one of the most important agricultural production bases in East Java Province, with a surplus of output exported to other regions.

2. Accommodation and Food and Beverage Services (average LQ = 1.42): The tourism sector (especially accommodation and culinary) is also a leading sector. This is in line with Jember's natural and cultural potential that attracts tourists, such as Papuma Beach, Meru Betiri National Park, and the Jember Fashion Carnival event.
3. Health Services and Social Activities (average LQ = 1.06): This sector shows a comparative advantage, most likely driven by the existence of fairly complete referral health facilities in Jember Regency.
4. Wholesale and Retail Trade; Car and Motorcycle Repair (average LQ = 1.10): As a growth center in the central-southern region of East Java, Jember has fairly strong trade activities.
5. Education Services (average LQ = 1.03): This advantage is likely related to the presence of public and private universities that attract students from outside the region.

Interestingly, the Manufacturing Industry (average LQ = 0.93) and Construction (average LQ = 0.96) sectors are still classified as non-core sectors, even though their values are close to one. This indicates that these sectors have not yet become Jember's main specialization compared to the province as a whole, but they have the potential to be developed.

Analysis of Economic Structure Shift using Shift-Share Analysis (SSA)

After identifying the leading sectors, the analysis continued with Shift-Share Analysis (SSA) to understand the growth dynamics of each sector between 2020 and 2025. The SSA calculation results are presented in Table 3.

Table 3. Results of Shift-Share Analysis for Jember Regency (2020-2025) in Billions of Rupiah

No	Economic Sector	Actual Growth	National Growth Effect (NGE)	Industry Mix Effect (IME)	Local Competitive Effect (LCE)
1	Agriculture, Forestry, and Fisheries	2,451.3	2,187.5	-158.2	**422.0**
2	Mining and Quarrying	21.5	20.1	-5.8	**7.2**
3	Manufacturing	1,890.7	1,985.4	298.7	**-393.4**
4	Electricity and Gas Supply	112.3	124.8	-18.9	**6.4**
5	Water Supply, Waste and Wastewater Management, Recycling	95.4	88.2	5.6	**1.6**
6	Construction	1,340.5	1,425.6	85.4	**-170.5**
7	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1,789.2	1,654.3	125.8	**9.1**
8	Transportation and Warehousing	680.1	698.5	-25.4	**7.0**
9	Accommodation and Food Services	1,120.8	950.2	48.7	**121.9**
10	Information and	450.3	485.1	125.3	**-160.1**

	Communication				
11	Financial and Insurance Services	520.9	498.2	85.4	**-62.7**
12	Real Estate	340.2	351.4	-15.8	**4.6**
13	Business Services	210.5	198.7	25.4	**-13.6**
14	Government Services	1,550.0	1,540.2	15.8	**-6.0**
15	Education Services	890.6	850.1	-28.5	**69.0**
16	Health and Social Services	1,050.4	920.3	20.1	**110.0**
17	Other Services	180.2	175.4	-12.5	**17.3**

Source: Data processed from BPS Jember Regency and BPS East Java Province (2022).

Local Competitive Effect (LCE): This component is most relevant for assessing competitiveness. Sectors with positive LCE show better performance than the provincial average. Sectors with High Positive LCE: Agriculture, Forestry, and Fisheries (Rp 422 billion), Accommodation and Food and Beverage Services (Rp 121.9 billion), Health and Social Services (Rp 110 billion), and Education Services (Rp 69 billion). These are very significant findings. These sectors are not only the basis of the economy (LQ > 1), but also have strong and continuously improving competitiveness. Their growth is driven by superior local factors, such as fertile natural resources for agriculture, strong tourism icons, and good quality education and health services. Sectors with Negative LCE: The most notable are the Manufacturing Industry (IDR -393.4 billion) and Construction (IDR -170.5 billion). Although both sectors grew nominally (actual growth was positive), their performance was far below the average growth of the same sectors in East Java Province. This indicates serious problems with the competitiveness of industry and construction in Jember, which could be caused by outdated technology, high logistics costs, or a lack of investment.

Industrial Proportional Effect (IME): IME shows whether a sector benefits or suffers due to its structure. The Manufacturing (Rp 298.7 billion) and Information and Communication (Rp 125.3 billion) sectors have high positive IMEs. This means that these sectors are growing very rapidly at the provincial level, and Jember should be able to take advantage of this trend. However, due to its highly negative LCE, Jember is losing momentum and falling behind in the competition for market share in these growing sectors.

National Growth Effect (NGE): Almost all sectors have a positive NGE, reflecting the positive overall economic growth of East Java Province during the period. This is a basic growth component enjoyed by all regions.

4. CONCLUSION

This study has successfully identified and analyzed the potential of leading sectors in Jember Regency using a combination of the Location Quotient (LQ) and Shift-Share Analysis (SSA) methods. Based on the results of the analysis, several important conclusions can be drawn. First, there are five sectors that have consistently been the base or leading sectors in Jember Regency during the 2020-2025 period, namely: (1) Agriculture, Forestry, and Fisheries; (2) Accommodation and Food and Beverage Services; (3) Health and Social Services; (4) Wholesale and Retail Trade; and (5) Education Services. The Agriculture, Forestry, and Fisheries sector stands out as the main leading sector with the highest LQ value.

Second, the Shift-Share analysis reveals different dynamics of competitiveness among these sectors. Leading sectors such as Agriculture, Accommodation and Food Services, Health Services, and Education Services not only have an LQ > 1 but also show a positive and high Local Competitive Effect (LCE). This proves that the superiority of these sectors is supported by strong and sustainable competitiveness, making them the main engines of economic growth in Jember.

Third, serious challenges were found in several potential sectors. The Manufacturing and Construction sectors, despite their significant contributions, showed a very negative LCE. This indicates a sharp decline in competitiveness, where the growth of these sectors in Jember is much slower than the average in East Java Province. This condition is of particular concern because the manufacturing industry is a sector with high added value and a large multiplier effect.

The implications of these findings for regional economic development are enormous. Jember Regency's future economic development policies should be differentiated. For leading sectors with high competitiveness, policies should focus on reinforcement or strengthening. Steps that can be taken include: (1) Agricultural Sector: agricultural modernization, agro-industry development, and access to expanded export markets; (2) Tourism Sector: development of new destinations, improvement of tourism human resource quality, and more massive promotion; (3) Health and Education Services Sector: improvement of service classes to attract patients and students from outside the region (medical and education tourism).

Meanwhile, for sectors with declining competitiveness, such as the Processing Industry, policies should be revitalization-oriented. Local governments need to conduct a comprehensive audit to identify the root causes of declining competitiveness, then design fiscal incentive programs, licensing facilities, and technical assistance programs to help local industries adapt and compete. This study provides a strong empirical basis for more targeted strategic planning, so that economic development in Jember Regency can be more effective, efficient, and sustainable. Further research is recommended to explore in greater depth the causal factors behind the negative LCE in the manufacturing sector.

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