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The Role of Leading Sectors in Supporting the Economic Growth of East Java Province Before and During the Covid-19 Pandemic

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ABSTRACT

East Java is one of the driving forces of Indonesia's economy as it is the second-largest contributor to the Gross Regional Domestic Product (PDRB) after DKI Jakarta. However, in 2020, the economy of East Java experienced a contraction with a growth rate reaching -2.33 percent. This was primarily due to the impact of the Covid-19 pandemic, which led to negative growth in several sectors. In order to achieve the objectives and targets of regional development, especially in terms of economic growth in East Java Province, regional development can be structured according to inter-sectoral goals. Through descriptive analysis, the Location Quotient (LQ) approach, the Shift Share approach, and overlay using the Real Gross Domestic Product (PDRB Rill) based on constant prices in 2010, four leading sectors were identified. These sectors are the manufacturing industry, wholesale and retail trade, motor vehicle and motorcycle repair, accommodation, and food services, as well as information and communication. These four leading sectors play a crucial role in supporting economic growth in East Java due to their rapid growth rate, high contribution, and broad market share, both before and during the Covid-19 pandemic. Hence, the government needs to prioritize these leading sectors to support economic growth in East Java Province.

Keywords: Covid-19, Economic Growth, Gross Domestic Regional Product, Overlay, Location Quotient, Shift Share

INTRODUCTION

Economic development in a region can be defined as the process involving both local government entities and various components of society in activities aimed at developing the diverse resources within the region. This process forms partnerships to generate new job opportunities and stimulate economic growth in that area (Arsyad 2010). The success of economic development efforts can be reflected in economic growth, which serves as an indicator. The Gross Regional Domestic Product (GRDP) at constant prices can be used as an indicator to gauge the overall economic growth rate from year to year (Marini 2016).

The Covid-19 pandemic has had negative impacts on people's lives globally, affecting both health and the economy due to the significant spread and growth of Covid-19. According to the Managing Director of the International Monetary Fund (2020), the Covid-19 pandemic is expected to cause short-term global economic slowdown. To prevent the spread of Covid-19, various countries worldwide implemented lockdown policies, which created pressure on economic activities, leading to economic constraints.

Economic growth in Java Island can be considered a major indicator of the national economy. This is because over half of Indonesia's development roles are produced in Java Island. Based on Figure 1, during the period 2017-2021, the value of GRDP in

Java Island relative to Indonesia's economy tended to decline since 2020. This can be attributed to the more pronounced impact of the Covid-19 pandemic on Java Island compared to other regions, requiring some time for economic recovery.

Source: Ministry of Trade (2022)

Figure 1 Comparison of the Role of Java Island's GRDP and Indonesia's GRDP 2017-2021 (percent)

Based on Figure 1, the largest contributions to Indonesia's GRDP were sequentially from DKI Jakarta, followed by East Java, and lastly West Java. This demonstrates that East Java Province also significantly contributes to Indonesia's economic growth. East Java's GRDP contributes on average 14.58 percent to Indonesia's GRDP. However, this GRDP value experienced a decreasing trend in 2020-2021 due to the Covid-19 pandemic. East Java's contribution was 14.58 percent in 2020, a decrease of 0.04 percentage points compared to the previous year, and dropped by a further 0.10 percent in 2021.

East Java is an economic promoter in Indonesia, evident from its favorable prospects in both industrial and agribusiness sectors. Therefore, regional development is essential for national economic growth. The economic growth rate in East Java showed a growth rate of 5 percent during the 2017-2019 period. However, as seen in Table 1, in 2020, East Java's economy contracted with a growth rate of -2.33 percent.

Table 1 Economic Growth Rates of Provinces in Java and National Level 2017-2021 (percent)

Region	2018	2019	2020	2021
East Java	5,47	**5,53**	**-2,33**	3,57
Central Java	5,30	5,36	-2,65	3,32
DI Yogyakarta	6,20	6,59	-2,68	5,53
West Java	5,65	5,02	-2,52	3,74
DKI Jakarta	6,11	5,82	-2,39	3,56
Banten	5,77	5,26	-3,39	4,44
Indonesia	5,17	5,02	-2,07	3,69

Source: data processed by BPS (2022)

Table 2 Roles of GRDP by Sector, 2017-2021 (billion)

	Industry	2018	2019	2020	2021
A	Agriculture, Forestry, and Fisheries	163,8	165,95	167,63	170,56
B	Mining and Quarrying	82,57	83,85	80,9	77,27
C	Manufacturing Industry	466,91	498,74	488,44	504,86
D	Electricity and Gas Supply	4,5	4,56	4,45	4,71
E	Water Supply, Waste Management, Waste, and Recycling	1,52	1,59	1,67	1,76
F	Construction	145,14	153,69	148,65	152,42
G	Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycl	290,14	307,44	289,71	312,38
H	Transportation and Warehousing	46,71	48,47	43,47	44,55
I	Accommodation and Food and Beverage Service Activities	85,24	91,66	83,55	86,11
J	Information and Communication	90,42	97,07	106,61	113,96
K	Financial and Insurance Services	39,86	41,37	41,45	42,14
L	Real Estate	26,82	28,44	29,57	30,24
M,N	Professional, Scientific, and Technical Services	12,31	13,13	12,18	12,47
O	Public Administration, Defense, and Mandatory Social Security	33,73	34,98	34,85	34,95
P	Education Services	41,04	44,02	45,76	46,34
Q	Health and Social Activities	10,49	11,28	12,24	12,85
R,S,T,U	Other Services	22,26	23,65	20,39	21,57
	Gross Regional Domestic Product (GRDP)	1563,44	1649,9	1611,51	1669,12

Source: data processed by BPS (2022)

This situation can be attributed to the Covid-19 pandemic causing negative growth or contraction in several sectors. During the pandemic period of 2020-2021, several sectors experienced declines compared to the previous year. As shown in Table 2, most sectors experienced decreases in 2020. However, not all sectors had decreased values in 2020. Some sectors managed to remain resilient during the pandemic, and almost all sectors showed growth in 2021.

The positive economic growth rate of 3.57 percent in East Java in 2021 indicates that the region has undergone economic recovery, partly due to relaxation of restrictions, leading to increased global demand (BPS 2022).

To continuously enhance the economy in East Java, the government needs to support and implement effective policies while identifying key sectors for each region continuously. Efficient and optimal implementation of work is also crucial to achieve the objectives of regional development. Thus, analysis, specification, and prioritization of key and non-key sectors are essential. This planning should be aimed at sectoral development based on the potentials and conditions of each sector, while achieving the desired developmental goals.

In order to reach these goals, determining priority sectors and their roles in supporting economic growth is essential. Various analyses, including descriptive analysis to identify sector conditions and the role of key sectors in economic growth, LQ analysis to identify key sectors, and Shift Share analysis to show sector growth and competitiveness, should be employed. After these analyses, classifying key sectors using overlay analysis will reveal their contributions, growth rates, and spreading effects. Additionally, government intervention through various local autonomy policies, as recommended, is necessary to foster the growth of key sectors in East Java.

To accelerate regional economic growth and contribute to GRDP, focusing on key sectors can be a driver of economic development. These sectors help control growth in other sectors (Ginting et al., 2020).

In summary, despite the Covid-19 impact, economic growth in East Java increased to 3.57 percent in 2021, mainly due to the presence of key sectors. These sectors greatly facilitate the implementation of government policies for effective resource allocation, ultimately leading to advanced and optimal economic development.

Thus, based on the above explanation, there is a need for research on "The Role of Key Sectors in Supporting Economic Growth in East Java Province Before and During the Covid-19 Pandemic," with the goal of identifying key and non-key sectors and their roles in driving economic growth. This will enable the government to prioritize key sectors effectively.

LITERATURE REVIEW

Economic growth can be interpreted as one of the most crucial indicators for measuring a country's economic progress. The analysis conducted on economic growth serves as a fundamental basis for shaping national development goals and guiding macroeconomic policies. This statement is consistent with efforts to establish strong and high-quality economic growth through a well-formulated combination of effective government policies in the fiscal and monetary domains. The resulting economic growth can be seen as an indicator of success in economic development endeavors. The outcomes of this economic development led to fundamental changes in the economic structure.

In general, economic development can be defined as the process of long-term per capita income increase among the population. Furthermore, economic development can also be understood as a series of efforts carried out through various policies to enhance income distribution, job opportunities, living standards, and regional

economic relations (BPS 2022). Based on this understanding, economic development signifies continuous improvement with positive impacts that are additive and corrective, leading to long-term increases in real income among the population.

In a broader sense, economic development can be understood as a continuous process with positive outcomes that contribute to augmenting and improving aspects that ultimately lead to sustained real income growth within the population. A significant aspect of economic development is the export activity, which plays a key role in boosting regional economies. The export concept involves producing goods or providing services that are sold beyond the region, either to other areas within the country or abroad, with the aim of generating profits

The concept of economic base theory generally identifies that economic growth in a certain area is directly linked to the demand for goods and services originating from outside that area. This theory suggests that the growth rate of a region's economy can be determined by the volume of exports produced by that region (Tarigan 2014). Exports constitute a vital component of the economic base. In a regional context, exports involve producing products or offering services that are sold outside the region, both domestically and internationally, with the goal of achieving profit.

The concept of leading sectors is generally associated with comparisons on various scales, whether regional, national, or international. At the national level, a sector can be classified as a leading sector if it competes effectively with similar sectors in other regions to generate significant exports (Silalahi 2011). A leading sector can be understood as a sector that is expected to contribute positively to regional growth. The criteria for leading sectors vary depending on their role in regional development. Factors that can influence leading sectors include natural resources or endowments.

According to Glasson (1997), the dominance of a leading sector in a region has a positive effect on the influx of income into that region. This leads to an increase in demand for goods and services in the region, thereby stimulating economic activities in non-leading sectors. In this context, leading sectors have a direct relationship with external demand, while non-leading sectors have an indirect connection with leading sectors. Therefore, leading sectors play a crucial role as the primary drivers of economic growth in that region.

MATERIALS & METHODS

In this research, the data used is secondary data obtained from various government agencies. These include data from the Central Bureau of Statistics (BPS) of East Java Province, other relevant institutions related to the research, various literature sources, and other relevant sources. The data used in this study covers the period from 2017 to 2021, as the analysis aims to examine the role of key sectors before and during the Covid-19 pandemic.

Descriptive Analysis

Descriptive analysis involves basic statistical descriptions that provide a general overview of each variable related to key sectors. The results of this analysis help understand the significance, strengths, and weaknesses of key sectors. In this research, the focus is on East Java Province to analyze the contributions of various sectors to the Gross Domestic Regional Product (GRDP) before and during the Covid-19 pandemic.

Location Quotient Analysis

Location Quotient (LQ) analysis offers insights into the contribution of a specific sector in a given area compared to other regions. The LQ analysis compares the income of a specific sector in the lower area with the total income of all sectors in that area. This is then compared with the income of the same sector in the higher area

(national level) with the total income of all sectors in the higher area (Tarigan, 2014). The LQ calculation formula is as follows:

LQ = (Sib/Sb)/(Sia/Sa)

Where:
Sib represents the income of sector i in the lower area
Sb represents the total income of all sectors in the lower area
Sia represents the income of sector i at the higher area (national level)
Sa represents the total income of all sectors at the higher area (national level)
If:

LQ > 1 indicates the sector is a key sector that can export to other regions
LQ < 1 indicates a non-key sector
LQ = 1 indicates the sector only meets its own needs

Shift Share Analysis

Shift Share (SS) analysis, first developed by Daniel Creamer in the 1940s and later formulated by Edgar S. Dunn in the 1960s, is a tool to show changes in a particular region. It reveals patterns of change through shifts and shares in the economic structure. SS analysis can identify production and employment shifts in a specific region by using all time points (Priyarsono et al., 2007). The analysis decomposes changes (d) in a specific variable in a given region into three components (equation 1): National Growth Effect (g), Industry Mix Effect (k), and Regional Share Effect (c). The sum of Industry Mix Effect and Regional Share Effect (kij + cij) is known as the net-shift of the sector. If the value (kij + cij) > 0, it signifies that sector i in region j is advancing (Marquillas, 1972).

dij=gij+kij +cij .....(1)
dij = Y'ij – Yij ……...…. (2)

Explanation:
dij represents the change in production of sector i in region j.
Y'ij represents the production of sector i in region j in the final year of the analysis.
Yij represents the production of sector i in region j in the initial year of the analysis.

National Growth Effect (gij)

National growth effect is the change in the national production due to changes in national economic policies or other factors that influence the overall economy (Priyarsono et al., 2007).
gij = Yij * Ra .....(3)
Ra = (Y'n - Yn) / Yn .....(4)

Explanation:
gij is calculated by multiplying Yij with Ra. This represents the value of the variable for sector i in region j.
Ra is the Ratio of production per labor (national).
Y'n represents the production per labor (national) in the final year of the analysis.
Yn represents the production per labor (national) in the initial year of the analysis.

Industry Mix Effect (kij)

Industry Mix Effect represents changes related to the performance of a particular sector, influenced by differences in markets, structures, and demand for end products.

kij=Yij.(Ri-Ra) .....(5)
Ra=(Y'i-Yi)/Yi .....(6)

Explanation:
1. Ri is the production ratio (national) in sector i.
2. Y'n is the production (national) in sector i at the end of the analysis.
3. Yn is the production (national) in sector i at the beginning of the analysis.

Regional Share Effect (cij)

Regional share effect indicates changes associated with sector performance, arising from differences in markets, end products, and structures.
SS analysis can be extended using the Esteban-Marquillas model, which adds an allocation effect (aij) and a homothetic

employment/output element for greater accuracy (Marquillas, 1972).

cij=Yij.(ri-Ri) .....(7)

ri=(Y'ij-Yij)/Yij .....(8)

Keterangan:

1. Ri represents the production ratio of sector i in region j

According to J.M. Esteban-Marquillas in 1972, the traditional shift-share (SS) model was expanded to address criticism that the industry mix effect is related to the regional share effect. This modification introduced a new element to the SS analysis called the homothetic employment/output element in sector i of region j. This homothetic element signifies the production in sector i in region j when the economic structure of region i is the same as the national economic structure (Marquillas, 1972).

Yht ij = Yj. Yi / Yn ……..…(9)

Description:

Yht ij represents the homothetic production/employment in sector i in region j.

Yj represents the production or employment in region j at the beginning of the analysis.

Yi represents the production/employment in sector i (national) at the beginning of the analysis.

In the Esteban Marquillas model, in the traditional model, the regional share effect is divided into two effects: the new regional share effect that is not correlated with the industry mix effect, and the additional component called the allocation effect (aij). The presence of the allocation effect will illustrate if a region specializes in sector i, indicated by the value (Yij - Yht > 0), or if a region has a competitive advantage (ri - Ri > 0) (Marquillas, 1972).

dij = gij + kij + cij + aij .....(10)

Therefore:

dij = Yij (Ra) + Yij (Ri - Ra) + Yhtij (ri - Ri) + [(Yij - Yht) (ri - Ri)]

The following table outlines the criteria for evaluating the allocation effect in the Esteban Marquillas modified shift-share analysis.

Table 3 Criteria for Evaluation of Shift Share with Esteban Marquillas Modification

Criteria	Specialized	Competitive advanced
	Yij - Yht	*ri - Ri*
Not having a competitive advantage but specialized	Positive	Negative
Not having a competitive advantage and not specialized	Negative	Negative
Having a competitive advantage but not specialized	Negative	Positive
Having a competitive advantage and specialized	Positive	Positive

Source: Marquillas 1972

Overlay Analysis

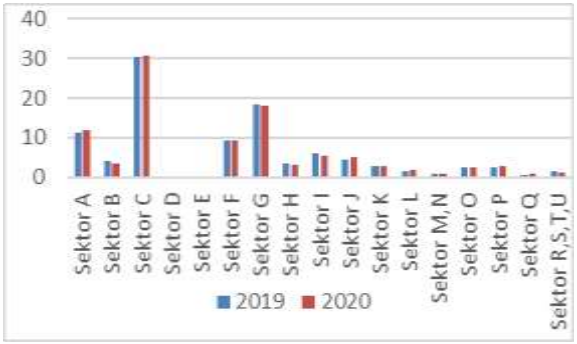
Overlay analysis combines the LQ and shift share calculations to provide a comprehensive view of key sectors. It is used to identify potential sectors with a competitive advantage, focusing on sectors with both high LQ and shift share values (Mark Drabenstott). This approach ensures that sectors with the highest potential to become key sectors are given priority.

RESULT

The development of business sectors before and during the pandemic

Gross Regional Domestic Product (GRDP) of East Java Province, which is categorized into 17 Field of Activities (FOA) that are further detailed according to the Indonesian Standard Industrial Classification (KBLI) 2009. These 17 categories illustrate the conditions and changes observed before the pandemic (2018-2019) and during the pandemic (2020-2021).

Based on Figure 2, it is evident that there were changes in each sector due to the Covid-19 pandemic. The values of individual sectors did not uniformly decline in 2020, even though they were impacted by the pandemic. Some sectors managed to remain resilient and even experienced growth. Priority will be given to the key sectors for implementation, as there are minimal costs associated with supporting economic growth.



Source: Processed data from BPS East Java (2022)
Figure 2 Contribution of Business Sector Fields to GRDP in 2019 and 2020

Identification of Key Sectors through Location Quotient Analysis

The values resulting from the LQ calculations are indicators that can be used to identify key and non-key sectors. The computed LQ values for the 17 field of activity sectors based on constant prices in 2010, both before and during the pandemic in East Java, are presented in Table 3. LQ values greater than 1 identify sectors as key sectors.

From the LQ calculations, it can be determined that both key and non-key sectors remained the same before and during the pandemic, although during the pandemic, some LQ values tended to increase or decrease. The key sectors, in sequence from the highest, include the manufacturing industry; water supply, waste management, and recycling; accommodation and food service activities; information and communication; electricity and gas supply; financial and insurance services; mining and quarrying; business services; construction; wholesale and retail trade, repair of motor vehicles and motorcycles; and education services. On the other hand, the non-key sectors, in sequence from the highest values, are other services; real estate; transportation and warehousing; agriculture, forestry, and fisheries; government administration, defense, and mandatory social security; health and social activities.

This statement indicates that several key sectors identified through ana lysis managed to withstand the pandemic's impact, even though the economic growth rate in East Java experienced a decrease or contraction. Meanwhile, the non-key sectors still require support to enhance their values, which can contribute to boosting economic growth. Based on the table above, the explanation of some sectors that fall into the key and non-key categories is as follows.

Table 4 LQ Values of East Java Province Before and During the Covid-19 Pandemic

Industry	Locaton Quotient			
	2018	2019	2020	2021
Agriculture, Forestry, and Fisheries	0,27	0,26	0,26	0,26
Mining and Quarrying	1,61	1,58	1,53	1,32
Manufacturing Industry	9,89	10,38	10,76	10,88
Electricity and Gas Supply	2,3	1,99	2,09	2,23
Water Supply, Waste Management, Waste, and Recycling	8,82	8,34	8,77	9,84
Construction	1,36	1,32	1,15	1,16
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	1,19	1,2	1,22	1,25
Transportation and Warehousing	0,46	0,45	0,53	0,45
Accommodation and Food and Beverage Service Activities	4,72	4,77	4,65	4,73
Information and Communication	2,3	2,37	2,39	2,47
Financial and Insurance Services	1,71	1,6	1,63	1,71
Real Estate	0,47	0,47	0,51	0,53
Professional, Scientific, and Technical Services	1,4	1,44	1,38	1,37
Public Administration, Defense, and Mandatory Social Security	0,24	0,23	0,24	0,23
Education Services	1,14	1,13	1,16	1,15
Health and Social Activities	0,23	0,23	0,24	0,23
Other Services	0,81	0,79	0,69	0,72

Source: BPS (2022), processed data

Growth of Key and Non-Key Sectors Before and During the Covid-19 Pandemic Using Shift Share Analysis

Shift Share analysis is a tool used to illustrate changes occurring in a region. This analysis conceptually depicts the patterns of change in the shift and share of the economic structure. It can identify production developments in a specific region using all time data points (Priyarsono et al., 2007)

Traditional Shift Share Approach

Using this analysis, the net-shift results for each sector are obtained. Positive net-shift values indicate favorable growth rates, while negative values indicate a need for accelerated growth.

Based on the shift-share calculations using the value of the Real Gross Regional Domestic Product (RGRDP) of the 17 field of activity sectors in East Java Province before the pandemic (2018-2019), as seen in the table below, the net-shift results for 11 sectors (C, E, F, G, I, J, L, M, N, P, Q, R, S, T, U) are positive. This suggests that these 11 sectors in East Java are categorized as sectors with advancing growth. The remaining 6 sectors are characterized by slower growth.

Table 5 Calculation of classic shift share values

Sector	*Net-Shift* Before the Pandemic	*Net-Shift* During the Pandemic	Sector	*Net-Shift* Before the Pandemic	*Net-Shift* During the Pandemic
A	-5,1	-1,48	J	2,65	4,54
B	-2,38	-5,76	K	-0,25	-0,4
C	11,15	3,57	L	0,43	-0,1
D	-0,14	0,14	M,N	0,27	-0,03
E	0	0,05	O	-0,24	-0,82
F	2,12	-0,15	P	1,17	-0,63
G	4,46	15,05	Q	0,33	0,29
H	-0,31	-0,06	R,S,T,U	0,41	0,64
I	2,65	0,36			

Source: Processed data (2023)

Similarly, based on the shift-share calculations using the value of the RGRDP of the 17 field of activity sectors in East Java Province during the pandemic (2020-2021), as shown in the table below, the net-shift results for 8 sectors (C, D, E, G, I, J, Q, R, S, T, U) are positive. This indicates that during the pandemic, only 8 sectors in East Java are categorized as having advancing growth. The other 9 sectors are characterized by slower growth. This number suggests that during the pandemic, the number of sectors with positive net-shift values or advancing growth decreased from the pre-pandemic period (11 sectors). This shows that the pandemic had an impact on the growth values among sectors.

Shift Share Approach with Modified EM

Here is a comparison of economic growth based on industries in East Java Province before and during the Covid-19 pandemic.

Table 6: Classification of Primary and Non-Primary Sectors Based on Esteban Marquillas Shift Share Analysis

Growth of Leading and Non-Leading Sectors Before the Covid-19 Pandemic		
	Specialized	Not Specialized
Having Competitive Advantage	Sector (C; G; I; J; M,N; P)	Sector (L)
Not Having Competitive Advantage	Sector (B; D; E; F; K)	Sector (A; H; O; Q; R,S,T,U)
Growth of Leading and Non-Leading Sectors During the Covid-19 Pandemic		
	Specialized	Not Specialized
Having Competitive Advantage	Sector (C; D; E; F; G; I; J; K; M,N; P)	Sector (A; L; R,S,T,U)
Not Having Competitive Advantage	Sector (B)	Sector (H; O; Q)

Source: Processed data (2023)

Pre-Pandemic Growth

Using the modified Esteban Marquillas shift share analysis allows us to identify specialized sectors with competitive advantages in a region. As seen in Table 5, there are 11 specialized sectors and 6 non-specialized sectors during the period before the pandemic. This indicates that specialized

sectors have a larger share of GRDP in East Java compared to the national level.

Conversely, this is not the case for sectors with competitive advantages. As seen from the table below, only 7 sectors have competitive advantages, while the remaining 10 sectors lack competitive advantages. This suggests that only seven sectors before the pandemic had a higher growth rate of GRDP in the field of business sectors in East Java compared to the national level.

Growth During the Pandemic

Using the modified Esteban Marquillas shift share analysis allows us to identify specialized sectors with competitive advantages in a region. As shown in the table below, there are 11 specialized sectors and 6 non-specialized sectors during the pandemic. This indicates that specialized sectors have a larger share of GRDP in East Java compared to the national level.

This also holds true for sectors with competitive advantages. As seen from the table below, there are 13 sectors with competitive advantages, while only 4 sectors lack competitive advantages. This indicates that during the pandemic, most sectors had a higher growth rate of GRDP based on field of business sectors in East Java compared to the national level.

Classification of Leading Sectors Using Overlay Analysis

In determining sectors with high contributions, competitive advantages, and specialization, an overlay process is conducted between the values from LQ analysis and shift share analysis. Sectors that qualify as leading sectors are those with an LQ value greater than 1, specialized shift share values, positive net-shift values, and competitive advantages.

Based on the analysis, four sectors emerge as leading sectors: manufacturing industry, wholesale and retail trade, accommodation and food services, and information and communication. These four sectors are considered leading due to their LQ values exceeding one, positive net-shift values, specialized shift share values, and competitive advantages, both before and during the pandemic period (2018-2021).

The results also indicate that there isn't significant sector change between the pre-pandemic and pandemic periods when considering the time frames. LQ values for each sector remained unchanged before and during the pandemic. Similarly, specialized sector calculations showed no change in values between these periods. The notable difference lies in the competitive shift share calculations. There are five sectors that initially had non-competitive values before the pandemic, but became competitive sectors during the pandemic. This suggests that the pandemic had a positive impact on some business sectors, as previously positive sectors remained so, and sectors with negative values turned positive.

A brief explanation of these sectors is as follows:

Sector A: During the Covid-19 pandemic, this sector's role increased. In 2020, its contribution rose as other sectors impacted by the pandemic contracted.

Sector D: In 2021, the sector experienced a growth increase of 5.82%, rebounding from a contraction of 2.39% the previous year. Both the subcategories of Electrical Power and Gas Supply and Ice Production experienced positive growth.

Sector E: Fluctuations in growth are significant in this sector. The growth rate increased by 6.44% in 2017, slowed to 4.18% in 2018, increased again to 4.71% in 2019, and continued to rise to 5.03% in 2020 and 5.67% in 2021.

Sector F: A notable increase in growth occurred in 2021 due to construction projects by both the government and private sector.

Sector K: In 2021, the sector's growth increased by 1.65%, a significant rise compared to the previous year's 0.18% in 2020. This growth was observed across all subcategories.

Sectors R, S, T, U: In 2021, the contribution of these sectors to East Java's total GRDP

increased to 1.24% from 1.23% in 2020. Moreover, the growth of these sectors improved by 5.78% in 2021, recovering from a contraction of 13.80% in 2020.

Additionally, from the analysis, some key points emerge. Some sectors have LQ values greater than one but lack competitive shift share values, and vice versa. This underscores the notion that evaluating leading sectors cannot solely rely on LQ calculations, as high LQ values don't necessarily equate to specialized and competitive shift share values

Table 7 Classification of Leading Sectors using Overlay Analysis

Sector	LQ Value		Shift Share value				Net-shift value	
	before (2018-2019)	during (2020-2021)	before covid-19 pandemic (2018-2019)		during covid-19 pandemic (2020-2021)		before (2018-2019)	during (2020-2021)
A	LQ<1	LQ<1	Not Spesialized	**Not competitive**	Not Spesialized	**Competitive**	-	-
B	LQ>1	LQ>1	Spesialized	Not competitive	Spesialized	Not Competitive	-	-
C	LQ>1	LQ>1	Spesialized	competitive	Spesialized	Competitive	+	+
D	LQ>1	LQ>1	Spesialized	**Not competitive**	Spesialized	**Competitive**	-	+
E	LQ>1	LQ>1	Spesialized	**Not competitive**	Spesialized	**Competitive**	+	+
F	LQ>1	LQ>1	Spesialized	**Not competitive**	Spesialized	**Competitive**	+	-
G	LQ>1	LQ>1	Spesialized	competitive	Spesialized	Competitive	+	+
H	LQ<1	LQ<1	Not Spesialized	Not competitive	Not Spesialized	Not Competitive	-	-
I	LQ>1	LQ>1	Spesialized	competitive	Spesialized	Competitive	+	+
J	LQ>1	LQ>1	Spesialized	competitive	Spesialized	Competitive	+	+
K	LQ>1	LQ>1	Not Spesialized	**Not competitive**	Spesialized	**Competitive**	-	-
L	LQ<1	LQ<1	Not Spesialized	competitive	Not Spesialized	Competitive	+	-
M,N	LQ>1	LQ>1	Spesialized	competitive	Spesialized	Competitive	+	-
O	LQ<1	LQ<1	Not Spesialized	Not competitive	Not Spesialized	Not Competitive	-	-
P	LQ>1	LQ>1	Spesialized	competitive	Spesialized	Competitive	+	-
Q	LQ<1	LQ<1	Not Spesialized	Not competitive	Not Spesialized	Not Competitive	+	+
R,S, T,U	LQ<1	LQ<1	Not Spesialized	**Not competitive**	Not Spesialized	**Competitive**	+	+

Source: processed data (2023)

DISCUSSION

The Role of Leading Sectors in Driving Economic Growth in East Java Province Before and During the Covid-19 Pandemic

Based on the overlay analysis, four leading sectors have been identified. The classification of leading sectors refers to those sectors that play a crucial role in East Java's economic growth due to their significant contribution to the national GDP, rapid growth rate, and wide market share. The following are specifications of the roles of the leading sectors in supporting economic growth in East Java.

Manufacturing Industry Sector

According to the overlay analysis, the manufacturing industry sector is considered a leading sector due to its LQ value exceeding one, specialization, and competitive advantage both before and during the pandemic. Despite many sub-sectors within the manufacturing industry in East Java experiencing a decline during the Covid-19 pandemic, there are also sub-sectors that saw an increase. This makes the manufacturing industry sector have the highest LQ value and competitive advantage. Notable sub-sectors include the

pharmaceutical industry, food and beverage industry, and tobacco industry.

The growth of the pharmaceutical sub-sector can be attributed to the increased demand for medicines and medical equipment during the pandemic, especially for antiviral drugs and Covid-19 vaccines. The food and beverage sub-sector saw mixed demand, with certain products consumed more at home due to people avoiding restaurants and cafes.

The significant role of the manufacturing industry is supported by statements from regional representatives and the Head of the Department of Industry and Trade in East Java, indicating a trend of improvement and recovery in the sector following the pandemic-induced contraction. With its contribution of around 30.6% to East Java's GDP structure, the manufacturing industry plays a strategic role in driving economic growth.

Wholesale and Retail Trade: Repair of Motor Vehicles and Motorcycles Sector

The overlay analysis categorizes this sector as a leading sector due to its LQ value exceeding one, specialization, and competitive advantage both before and during the pandemic. This sector is recognized as an essential contributor to East Java's economic growth.

In 2021, the sector was the second-largest contributor to East Java's GDP structure at 18.72%, experiencing growth of 7.83% compared to the previous year's contraction of -5.77%. The sector benefits from East Java's large population as domestic consumers and its strategic geographical position connecting Western and Eastern Indonesia. This positions the wholesale and retail trade, repair of motor vehicles and motorcycles sector as a significant pillar of East Java's economic growth.

The relaxation of government policies during 2021, particularly in the second and fourth quarters, aligns with decreased Covid-19 cases and leads to longer operational hours and increased visitors to shopping centers. Rising income levels also contribute to positive business performance. Government policies, including tax incentives for vehicle purchases, further stimulate growth in this sector.

Accommodation and Food Services Sector

The overlay analysis identifies the accommodation and food services sector as a leading sector due to its LQ value exceeding one, specialization, and competitive advantage both before and during the pandemic. This sector's pivotal role in supporting East Java's economic growth is evident.

The sector's performance improved in 2021, attributed to stringent health protocols reflecting the adaptation to new economic norms. Its growth rate of 3.06% in 2021 accelerated compared to a contraction of -8.85% in 2020.

The sector saw significant improvement in 2021 due to the relaxation of economic activity restrictions compared to the previous year. Implementation of new normal protocols and accelerated Covid-19 vaccinations contributed to increased activities such as meetings, incentives, conventions, exhibitions (MICE), reopening of tourist sites, restaurants, and shopping centers.

Increased visits to hotels, tourist sites, restaurants, and shopping centers throughout 2021, supported by strict health protocols, are visible indicators of the sector's positive growth. This is further supported by higher local tax revenues and contributions. Continued efforts to maintain this trend through strict health protocols and sustainable tourism promotion strategies are ongoing.

Information and Communication Sector

The overlay analysis categorizes the information and communication sector as a leading sector due to its LQ value exceeding one, specialization, and competitive advantage both before and during the pandemic.

Pre-pandemic, the information and communication sector (ICT) in East Java positively contributed to regional economic growth. ICT plays a pivotal role in driving innovation, productivity, market integration, and global connectivity across various economic sectors.

According to 2019 data from BPS, the ICT sector contributed approximately 10.9% to East Java's GDP, equivalent to around IDR 139 trillion. This sector encompasses telecommunications, media, computing, and information services industries.

During the Covid-19 pandemic, the importance of the ICT sector further escalated due to the necessity of remote work and learning. Digital applications and e-commerce platforms gained wider usage in East Java, boosting demand and investment in the ICT sector. Furthermore, the ICT sector indirectly stimulates economic growth in other sectors by utilizing information and communication technology. For instance, e-commerce applications promote local product sales, and 5G technology enhances efficiency in the industrial and transportation sectors.

CONCLUSION

Based on the estimations conducted through descriptive analysis, Location Quotient (LQ) analysis, shift share analysis, and overlay analysis, several conclusions have been drawn, including the following:

1. Based on the overlay analysis, four leading sectors have been identified, namely the manufacturing industry sector, wholesale and retail trade including the repair of motor vehicles and motorcycles, accommodation and food services, and information and communication sector. The criteria for identifying leading sectors include having an LQ value exceeding one, a positive net-shift, specialized and competitive shift share, both before and after the pandemic.
2. Leading sectors play a pivotal role in economic growth due to their substantial contribution, rapid growth rate, and broad market share, both before the pandemic and during it. As a result, these leading sectors can be prioritized to support East Java's economic growth.

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