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Analysis of Economic Growth Sectors in Surakarta City Before and During the Covid-19 Pandemic: Location Quotient *Approach*

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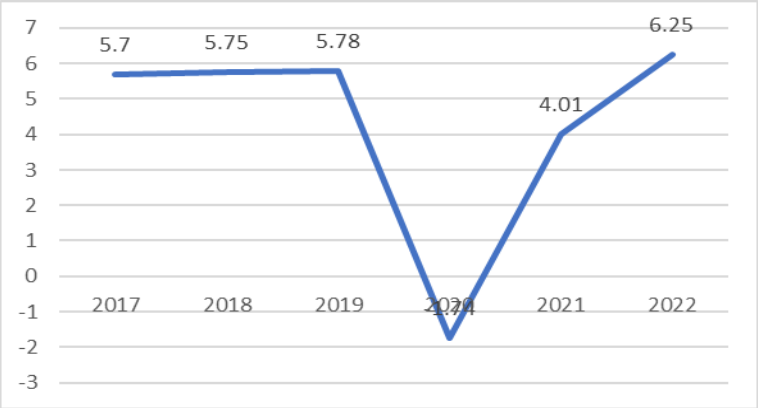
Abstract

This study aims to analyze the base and non-base sectors of economic growth in Surakarta City before and during the COVID-19 pandemic using the Location Quotient (LQ) approach. The data used is Gross Regional Domestic Product (GDP) based on constant prices according to business fields. The research period was analyzed separately, namely before the pandemic (2017-2019) and during the pandemic (2022). The results showed no change in the classification of base and non-base sectors in Surakarta City both before and during the COVID-19 pandemic. However, there were changes in LQ values in several sectors during the COVID-19 pandemic compared to before the COVID-19 pandemic. Sectors such as construction, trade, information and communication are still the dominating base sectors, while the agricultural sector, processing industry, transportation, and other services are still non-base sectors. This study provides an overview of the impact of COVID-19 on sectoral economic growth in Surakarta City and sectors that can be prioritized to encourage regional economic recovery.

Keywords: *Base; Non Base; Economic Growth; Covid-19; LQ*

Introduction

Economic growth is one of the most important indicators for the development of a country that aims at the progress and welfare of society. One way to increase and encourage economic growth is to increase the potential of various sectors, so that potential sectors in a region can encourage economic development and improve the welfare of the people (Millenia, 2019). Surakarta City is one of the cities in Central Java province that has the potential of its region and plays an important role in the regional economy. The following is the economic growth rate in Surakarta City in 2017-2022.



Graph 1. Economic Growth Rate in Surakarta City for the 2017-2022 period
Source: BPS Kota Surakarta, processed

The economic growth rate in Surakarta City in 2017-2019 showed a positive trend with an average of 5.74 percent. The growth was dominated by the Information and Communication sector with an average growth of 12.43 percent. However, in 2020 the economic growth rate decreased significantly with growth of -1.74. The slowing pace of economic growth in 2020 was caused by the entry of the COVID-19 pandemic, which affected various business sectors. Sectors affected by the COVID-19 pandemic include the transportation and warehousing sector by -62.69 percent. The sector of providing accommodation and food and drink amounted to -15.67 percent. As well as other service sectors with growth of -14.32 percent (BPS, 2020).

Declining economic activity has an impact on the economic cycle which includes the production, distribution, and marketing of goods and services (Nuraini &; Suman, 2024). The government has tried to suppress the spread of the coronavirus by imposing social distancing policies such as large-scale social restrictions (PSBB) and tightening health protocols. In 2021, economic growth in Surakarta City began to improve with an increasing growth rate of 4.01 percent. The increasing rate of growth in a positive direction goes hand in hand with the increase in vaccination and people begin to adapt to new habits (Wasita, 2022). Sectors with positive growth during the COVID-19 pandemic include accommodation and food and drink providers by 8.43 percent. The information and communication sector amounted to 7.68 percent. The electricity and gas procurement sector amounted to 6.85 percent. The processing industry sector amounted to 6.13 percent. As well as large trade and retail sectors; Car and motorcycle repairs by 5.75 percent (Chomariah, 2022). In 2022, the economy of Surakarta City experienced positive growth of 6.25 percent, this figure is greater than the achievement of economic growth in 2021. The Transportation and Warehousing sector experienced the highest growth of 131.39 percent on the production side. Meanwhile, on the expenditure side, the consumption expenditure component of non-profit institutions serving households ranged from 5.85 percent (BPS, 2023).

Economic sectors are considered important in encouraging economic growth (Hutapea et al., 2020). This means that the increase in the base sector and non-base sector will have an impact on increasing the rate of economic growth (Pratama &; Soejoto, 2016). In a balanced economic development, the government strives to develop strategies that integrate development in the base and non-base sectors. Where, the base sector is a sector that can meet local or regional needs by exporting goods and services out of the region (Wicaksono, 2013). The non-base sector is the ability of the sector to meet limited local needs so that there is no need to export goods and services out of the region. (Hutapea et al., 2020). So in planning regional economic development, the identification of base and non-base sectors is very important. In determining the base sector and non-base sector, can be determined by analysis methods *Location Quotient* (LQ). Research *Location Quotient* will use a Gross Domestic Product (GDP) constant price basis. Based on the theory of economic base, where the value of LQ is greater than 1 then a region can produce more *output* compared to the consumption of the population in the region (Morrissey,

2016). While the LQ value is less than 1, then the sector that produces *Output* is less prospective to be developed, imports from outside the region are needed (Assidikiyah et al., 2021).

Several studies have used the analysis of *Location Quotient* (LQ) to identify base and non-base sectors in different regions. Research Sagajoka (2020) found that in Ende Regency, the large trade and retail sectors; transportation and warehousing; real estate; and the processing industry is identified as the base sector, while the company's service sector; accommodation providers; and information and communication are non-base sectors. Similarly, in Jayawijaya Regency, there are 15 base sectors and 2 non-base sectors identified, non-base sectors show low competitiveness (Redu et al., 2023). The base sector has a positive influence on economic growth, so the base sector becomes the main sector in economic growth. Meanwhile, non-base sectors together influence economic growth (Marna, 2023). Other research by Jumiyanti (2018) argues that the base sector has a positive impact on the economy of a region. Nuraini & Suman (2024) Explained that the existence of COVID-19 has an impact on declining conditions so that most service-based areas can recover faster. Assidikiyah et al (2021) research shows that before and during the COVID-19 pandemic, several sectors experienced a decline, but the decline did not change the categories of base and non-base sectors in East Java Province.

Based on the background that has been explained, it is necessary to analyze the base and non-base sectors before and during the COVID-19 pandemic with a *Location Quotient* (LQ) approach using constant price GDP data based on business sectors. This study provides an overview of the impact of COVID-19 on sectoral economic growth in the city of Surakarta and sectors that can be prioritized to encourage regional economic recovery.

Research Methodology

This study used a quantitative descriptive method with the *Location Quotient* (LQ) analysis tool. The data used is secondary data obtained through journals, websites, and other agencies such as the Central Statistics Agency taken in 2017-2022. Where, the period before the covid-19 pandemic was taken starting from 2017-2019 while the period during the covid-19 pandemic was taken from 2020-2022. The data used is GDP based on constant prices based on the business sector with the object of research, namely Surakarta City.

Location Qoutient Analysis (LQ)

Location Quotient (LQ) is an analytical method for determining base and non-base sectors that have economic potential in a region. LQ calculation by comparing the *output* of sectors in a particular region with the output of sectors in a regional area. The *Location Quotient* (LQ) calculation formula is as follows:

$$LQ = \frac{\left(\frac{y_i}{y_t}\right)}{\left(\frac{Y_i}{Y_t}\right)}$$

where:

y_i = Income (GRDP) of the economic sector in Surakarta City

y_t = Total revenue (GRDP) in all economic sectors of Surakarta City

Y_i = Income (GRDP) of the economic sector in Central Java Province

Y_t = Total revenue (GRDP) in all economic sectors of Central Java Province

Assidikiyah et al (2021) explained that after calculating LQ, there is a grouping of economic sector categories, namely:

1. If the LQ value > 1, it means that the sector belongs to the base sector category. Where, the economic sector is able to meet the needs of its region so that there is no need for imports from outside the region.
2. If the value of LQ = 1, it means that the sector can only meet the needs of its region. The degree of specialization of the studied and comparable areas is the same.
3. If the LQ value < 1, it means that the sector is unable to meet the needs of the region, it is due to the lack of prospective sectors to be developed so imports need to be made from outside the region. This sector is included in the category of non-base sectors.

Results and Discussion

This research was taken using data on the Gross Regional Domestic Product (GRDP) of Surakarta City based on constant prices according to business fields. The entry of the COVID-19 pandemic has had an impact on changes in the pattern of economic activities in the community. The following are the results of the *Location Quotient* (LQ) analysis before and during the COVID-19 pandemic.

Table 1. Results of Location Quotient (LQ) before and during the covid-19 pandemic

Business Field	Before the Covid-19 Pandemic		During the Covid-19 Pandemic	
	LQ	Categories	LQ	Categories
Agriculture, Forestry and Fisheries	0,03	NON BASE	0,03	NON BASE
Mining and Quarrying	0,00	NON BASE	0,00	NON BASE
Processing Industry	0,22	NON BASE	0,23	NON BASE
Electricity and Gas Procurement	2,07	BASE	2,04	BASE
Water Supply, Waste Management, Waste and Recycling	2,41	BASE	2,20	BASE
Konstruksi	2,49	BASE	2,36	BASE
Wholesale and Retail Trade	1,60	BASE	1,54	BASE
Transport and Warehousing	0,84	NON BASE	0,50	NON BASE
Accommodation and Dining Providers	1,53	BASE	1,44	BASE
Information and Communication	3,01	BASE	3,05	BASE
Financial and Insurance Services	1,24	BASE	1,24	BASE
Real Estate	2,27	BASE	2,20	BASE
Corporate Services	1,99	BASE	1,90	BASE
Government Administration, Defence and Compulsory Social Security	2,02	BASE	1,97	BASE
Education Services	1,09	BASE	1,05	BASE
Health and Social Services	1,22	BASE	1,25	BASE
Other Services	0,59	NON BASE	0,52	NON BASE

Source: Processed Data

Based on LQ calculations, it can be seen that before the Covid-19 pandemic hit, Surakarta City had 12 base sectors with LQ value calculation criteria of > 1, including the Electricity and Gas Procurement sector (2.07); Water Procurement, Waste Management, Waste and Recycling (2.41); Construction (2.49); Wholesale and Retail Trade (1.60); Accommodation and Dining Providers (1.53); Information and Communication (3.01); Financial Services and Insurance (1.24); Real Estate (2.27); Corporate Services (1.99); Government Administration, Defense and Compulsory Social Security (2.02); Education Services (1.09); and Health Services and Social Activities (1.22). While the non-base sector of

Surakarta City consists of 5 sectors with LQ < 1 results, including the Agriculture, Forestry and Fisheries sector (0.03); Mining and Quarrying (0.00); Processing Industry (0.22); Transportation and Warehousing (0.84); and the Other Services sector (0.59).

The LQ calculation results show that during the Covid-19 pandemic, sectors with LQ value calculation results < 1, Surakarta City has 12 base sectors including the Electricity and Gas Procurement sector (2.04); Water Procurement, Waste Management, Waste and Recycling (2.20); Construction (2.36); Wholesale and Retail Trade (1.54); Accommodation and Meal Providers (1.44); Information and Communication (3.05); Financial Services and Insurance (1.24); Real Estate (2.20); Corporate Services (1.90); Government Administration, Defense and Compulsory Social Security (1.97); Education Services (1.05); Health Services and Social Activities (1.25). Meanwhile, there are 5 non-base sectors with LQ < 1 during the Covid-19 pandemic, including the Agriculture, Forestry, and Fisheries sectors (0.03); Mining and Quarrying (0.00); Processing Industry (0.23); Transportation and Warehousing (0.50); and Other Services (0.52).

The categories of base and non-base sectors in Surakarta City did not change both before the COVID-19 pandemic and during the COVID-19 pandemic, but some sectors experienced changes in LQ values during the COVID-19 pandemic compared to the period before the COVID-19 pandemic. Most sectors experienced a decline in LQ value, namely Electricity and Gas Procurement; Water Procurement, Waste Management, Waste and Recycling; Construction; Wholesale and Retail Trade; Transportation and Warehousing; Accommodation and Meal Providers; Information and Communication; Real Estate; Corporate Services; Government Administration; Defense and Compulsory Social Security; and Other Services. On the other hand, some sectors have increased the value of LQ such as the Processing Industry; Information and Communication; Health Services and Social Activities. The increase in LQ value indicates that these sectors can maintain immunity against the COVID-19 pandemic. Changes in LQ values in several sectors indicate changes in relative concentration levels due to the COVID-19 pandemic in Surakarta City.

Table 2. Analysis of Base and Non-Base Sector Contributions before and during the pandemic

Business Field	Before Covid-19 Pandemic			During Covid-19 Pandemic		
	PDRB	LQ	Category	PDRB	LQ	Category
Agriculture, Forestry and Fisheries	141,550,44	0,03	NON BASE	152,246,83	0,03	NON BASE
Mining and Quarrying	305,72	0,00	NON BASE	146,33	0,00	NON BASE
Processing Industry	2,571,547,21	0,22	NON BASE	2,757,239,99	0,23	NON BASE
Electricity and Gas Procurement	75,821,26	2,07	BASE	86,182,79	2,04	BASE
Water Procurement, Waste Management, Waste and Recycling	56,373,38	2,41	BASE	58,567,93	2,20	BASE
Construction	8,638,497,45	2,49	BASE	8,982,798,80	2,36	BASE
Wholesale and Retail Trade	7,813,025,27	1,60	BASE	8,204,339,78	1,54	BASE
Transportation and Warehousing	966,802,03	0,84	NON BASE	570,104,25	0,50	NON BASE
Accommodation and Dining Providers	1,679,401,34	1,53	BASE	1,790,103,33	1,44	BASE
Information and Communication	4,886,671,71	3,01	BASE	6,835,394,89	3,05	BASE
Financial Services and Insurance	1,135,888,66	1,24	BASE	1,234,137,87	1,24	BASE
Real Estate	1,436,223,46	2,27	BASE	1,546,170,54	2,20	BASE
Company Services	257,285,40	1,99	BASE	266,399,36	1,90	BASE
Government Administration, Defense and Compulsory Social Security	1,738,466,12	2,02	BASE	1,772,289,19	1,97	BASE
Education Services	1,413,484,25	1,09	BASE	1,498,837,26	1,05	BASE
Health Services and Social Activities	354,761,76	1,22	BASE	433,917,24	1,25	BASE
Other Services	333,057,48	0,59	NON BASE	312,190,94	0,52	NON BASE

Source: BPS Kota Surakarta, processed data

Based on the table, shows that the sectors that dominated in Surakarta City before the Covid-19 pandemic included the Construction sector with a GDP value of IDR 8,682,497,450,000 and an LQ value of 2.49 with the Base sector category. Large Trade and Retail sector with a GDP value of Rp 7,813,025,270,000 and an LQ value of 1.60 with a base sector category. The Information and Communication sector has a GDP value of Rp 4,886,671,710,000 with an LQ value of 3.01 in the base sector category. The Government Administration, Defense and Compulsory Social Security sector has a GDP value of Rp 1,738,466,120,000 and an LQ value (2.02) with the base sector category. Accommodation and Dining Provider sector with a GRDP value of IDR 1,679,401,340,000 and LQ value (1.53) with a base sector category. The Real Estate sector with a GDP value of Rp 1,436,223,460,000 and an LQ value (2.27) is included in the base sector category. The education service sector with a GDP value of Rp 1,413,484,250,000 and an LQ value (1.09) is included in the base sector category. The financial and insurance services sector with a GDP value of Rp 1,135,888,660,000 and an LQ value (1.24) is included in the base sector category. The Processing Industry sector with a contribution of IDR 2,571,547,210,000 and LQ value (0.22) is included in the non-base category. The Transportation sector contributed IDR 966,802,030,000 and the LQ value (0.84) was included in the non-base sector category. Other Service Sector with a contribution of IDR 333,057,480,000 and LQ value (0.59) is included in the non-base sector category. As well as the Agriculture, Forestry, and Fisheries Sectors contributed IDR 141,550,550,440,000 LQ value (0.03) including the non-base sector category.

Meanwhile, during the COVID-19 pandemic, the dominating sectors in Surakarta City include the Construction sector with a GDP value of IDR 8,982,798,800,000 and an LQ value (of 2.36) including the base sector category. Large Trade and Retail sector with a GDP value of Rp 8,204,339,780,000 and an LQ value (1.54) with a base sector category. The information and communication sector has a GDP value of Rp 6,835,394,890,000 and an LQ value (3.05) is included in the base sector category. The Accommodation and Dining Provider sector with a GRDP value of IDR 1,790,103,330,000 and an LQ value (144) is included in the base sector category. The Government Administration, Defense and Compulsory Social Security sector has a GDP value of Rp 1,772,289,190,000 and an LQ value (1.97) including the base sector category. The Real Estate sector with GDP value of Rp 1,546,170,540,000 and an LQ value (2.20) with the base sector category. The education service sector has a GDP value of Rp 1,498,837,260,000 and the LQ value (1.05) is included in the base sector category. The Financial and Insurance Services sector has a GDP value of Rp 1,234,137,870,000 and an LQ value (1.24) with the base sector category. The Processing Industry sector contributed IDR 2,757,239,980,000 and the LQ value (0.23) was included in the non-base sector category. The Transportation and Warehousing sector contributed IDR 570,104,240,000 with an LQ value (0.50) included in the non-base sector. The other Services Sector contributed IDR 312,190,930,000 with an LQ value (0.52) included in the non-base sector. As well as the Agriculture, Forestry, and Fisheries sectors contributed IDR 152,246,830,000 with an LQ value (0.03) included in the non-base sector.

Lapong et al (2019) explained that the management of base and non-base sectors are important for regional economic development. Based on the RPJMD of Surakarta City, it is explained that the shape of the economy of Surakarta City, namely the Service sector, contributes 39.2 percent; construction by 25.9 percent; trade 23.3 percent; processing industry by 7.6 percent. This means that, the economy in Surakarta City is oriented towards creative economy services, this is because the Surakarta City area has limited land for production business.

Conclusion

The results of *the Location Quotient* (LQ) analysis in the pre-pandemic period and during the COVID-19 pandemic showed that several business sectors experienced a decline, but the decline did not change the status of the base and non-base categories in Surakarta City. This means that the dominating sector in the period before the COVID-19 pandemic did not change the status of the base or non-base

sector, changes occurred in the value of LQ, where the value of LQ during the COVID-19 pandemic decreased compared to before the covid-19 pandemic. The decline in base and non-base sectors before and during the pandemic includes Electricity and Gas Procurement; Water Procurement, Waste Management, Waste and Recycling; Construction; Wholesale and Retail Trade; Transportation and Warehousing; Accommodation and Meal Providers; Information and Communication; Real Estate; Corporate Services; Administration and Government; Defense and Compulsory Social Security; and Other Services. Meanwhile, sectors that survived during the Covid-19 pandemic include the Processing Industry; Information and Communication; Health Services and Social Activities.

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