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Leading Sectors among the Provinces of Java Island

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Abstract

This study aims to analyze the leading sector among provinces of Java Island. To accomplish economic development in a region, the local government often takes part in increasing the GDRP to achieve the people's well-being. It is essential to understand what sectors that could bring the most benefit to the economic agents. This study uses the Location Quotient (LQ) method with the sectoral current price GDRP data. The main result has shown that the provinces of Java Island have their advantage and disadvantage. Most of them excel in the agricultural sector except Jakarta Special Capital Region (SCR). Banten has a better real estate sector than the rest of Java Island, while most services sector has led by Jakarta SCR.

Keywords: leading sector; Location Quotient; Java Island
JEL Classification: E0; R11; R12

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INTRODUCTION

This study aims to find and analyze a leading sector in Java Island. Since the leading sector was determined by a gross domestic product in a region, it is implied the good and the bad side of a particular economic sector in a region. Gross Domestic Regional Product or GDRP is often used as a proxy to measure economic development in a region. Since GDRP is a function of consumption, investment, and government expenditure (Mankiw, 2016), it reflected a particular economic sector's performance, which gives the most benefit to the economic agents. As a definition, GDP or GDRP is a monetary measurement of final goods and services produced and consumed by a country or a region during a period (Mankiw, 2016).

GDRP also determined the amount of input, which is labor, that could be employed. It is because the goods and services that are produced also determined by the amount of labor hired. The positive relationship between GDRP and employment is also known as Okun's law. Recent studies around the world have shown that an increase in GDP resulted in an increase in employment, which will reduce unemployment in general (Maitah *et al*., 2015; Malec *et al*., 2016; Mandel & Liebens, 2019).

The importance of increasing GDRP imposes the local government to invest and spend money through fiscal policy in a potential sector that could boost GDRP and benefit the economic agents (Abdullah & Rusdarti, 2017; Al-Abri et al., 2018; Nurlina, 2015). However, the local government could not give a stimulus to all existing economic sectors in a region. The government budget was limited. However, the government will have to choose the most optimal sector to give the biggest benefits to the economic agents.

This study aims to find and analyze a leading sector in one of the biggest regions in Indonesia. This study uses the island of Java as a scope. Java Island has six administrative provinces: The Special Capital Region of Jakarta, Banten, West Java, Central Java, East Java, and The Special Region of Yogyakarta. The reason is that Java is the most populated island in the world, with a 124 million population. Java Island also possessed the largest percentage of GDRP among other regions in Indonesia. The combination of GDRP in all administrative provinces of Java Island significantly bigger than the combination of other provinces in Indonesia.

Table 1. GDRP in Indonesia (2018)

Region	% of GDRP
Java Island	58,48%
North Sumatera	4,95%
East Kalimantan	4,26%
South Sulawesi	3,09%
Other	29,22%

Note: the data was taken from the dynamic table menu on Statistics Indonesia's website. Java Island is a combination of six administrative provinces. North Sumatera, East Kalimantan, and South Sulawesi are the next notable provinces with a bigger % of GDRP. Other is a combination of other regions outside Java Island, North Sumatera, East Kalimantan, and South Sulawesi.

Statistics Indonesia categorized the economic sectors into seventeen classifications, which are: A.) agriculture, forestry, and fishery; B.) mining and

quarrying; C.) manufacturing; D.) electricity and gas; E.) water supply and sanitation; F.) construction; G.) wholesale and retail trade, vehicle reparation; H.) transportation and warehouses; I.) accommodation and food services; J.) information and communication; K.) financial services; L.) real estate; M, N.) corporate services; O.) government administration, defense, and social security; P.) education services; Q.) health services and social activities; R, S, T, U.) other services (Badan Pusat Statistik, 2016).

This study is not the first study that analyzes the leading sector in Indonesia's region. Indonesia was known as an agricultural country. Therefore, recent studies that analyze the leading sector in Indonesia obtained a similar result, which stated that agriculture is a leading sector in several regions in Indonesia (Kembauw *et al*., 2015; Mangilaleng *et al*., 2015; Mulyono & Munibah, 2016; Priana, 2016; Raqib & Rofiuddin, 2018). It is possible due to the education of Indonesian people that still in bad shape. The average length of school years in Indonesia is 8.75 (Badan Pusat Statistik, 2019). The number means that the Indonesian people only got an education as long as 8.75 years, which equates to a junior high school graduate. Studies have shown that less-educated people will end up working in an informal sector (Aikaeli & Mkenda, 2014; Bairagya, 2012; Bolang & Osumanu, 2019; Wubeshet, 2017). Agriculture is one of the informal sectors. More labor in agriculture increases the production of agricultural goods, which will increase the GDRP in the agriculture sector.

Many studies that analyzed the leading sector in various Indonesia's regions analyzed it only from one perspective. They took one particular administrative city or province and analyzed the leading sector relative to the more aggregated administrative region. For example, Mulyono & Munibah (2016) analyzed a leading sector in Bantul Regency and compared it to all cities and regencies in the Special Region of Yogyakarta as a higher administrative region. Another case is Priana (2016), who analyzed the leading sector in East Java province relative to Indonesia's provinces, as well as other studies that did the same.

Although that kind of analysis gives us more specific implications regarding a particular region, it does not give us a comprehensive look at all administrative cities or provinces in the same region. This study does not analyze one, but all six provinces located on the island of Java. Therefore, it will give a more meaningful policy implication of how one province that does not excel in some sectors could benefit from its neighbor provinces, which excel at those sectors and vice versa.

This study also uses the latest up-to-date statistical data obtained from Statistics Indonesia. Using 2019 constant price GDRP from seventeen sectors in six provinces of Java Island rather than a current price GDRP gives a more suitable measurement as an increase in constant price GDRP is not caused by an increase in a price due to inflation.

This study uses a location quotient analysis to find and analyze a leading sector in Java Island. The main result is that the provinces of Java Island mostly dominated the manufacturing sector and water supply sector along with the agriculture sector. On the other hand, the sectors that are not superior in Java Island are the financial services and the corporate services sector.

METHOD

Based on the purpose, this study, as well as other studies, uses location quotient (LQ) analysis to find and analyze the leading sector among provinces of Java island (Kembauw *et al*., 2015; Mangilaleng *et al*., 2015; Mulyono & Munibah, 2016; Priana, 2016; Raqib & Rofiuddin, 2018). LQ method divides the sector into two categories: base sector and non-base sector. The base sector means a particular sector in a region has a comparative advantage compared to other sectors. It also means that the product of that particular sector was sufficient to fulfill the needs in one region and still has a spare to be exported to other regions (Raqib & Rofiuddin, 2018). The basic equation for LQ analysis is as follows (Antara *et al*., 2017):

$$LQ = \frac{S_{ib}/S_b}{S_{ia}/S_a} \quad \text{.....(1)}$$

S_{ib} is a notation that refers to the GDRP of the i-th sector in a b-th region. S_b is a total GDRP of all sectors in a b-th region. S_{ia} is a GDRP of i-th sector in a higher region a. S_a is a total GDRP of all sectors in a higher region a. in this study, b-th regions are The Special Capital Region of Jakarta, Banten, West Java, Central Java, East Java, and The Special Region of Yogyakarta, while the region a is the island of Java.

The status of whether the sector is a base sector or not relies on an LQ value. If $LQ > 1$, a sector is considered a base sector with an advantage over other sectors, and the product could also be exported to other regions. If $LQ < 1$, a sector is considered a non-base sector, and the product is insufficient to meet the needs of the people in a region. A sector could also be just sufficient to its region without being able to export its product if $LQ = 1$ (Raqib & Rofiuddin, 2018), although it is still considered as a non-base sector. A region could have more than one base sector based on LQ analysis. However, a higher LQ value means the sector is superior to others even though those sectors are classified as a base sector.

The data was collected from Statistics Indonesia's website. Each province in Indonesia possessed a dedicated website. The data located in the dynamic table menu on the respective province's website. This study uses constant price GDRP from six provinces of Java Island that are divided into seventeen sectors. The data then tabulated into a single file with the spreadsheet format. The data then calculated with the LQ equation to get the LQ value for all sectors in all provinces of Java Island.

RESULTS AND DISCUSSION

This study aims to find and analyze the leading sectors among six provinces of Java Island. The provinces are The Special Capital Region of Jakarta, Banten, West Java, Central Java, East Java, and The Special Region of Yogyakarta. The sectors that analyzed in this study are: A.) agriculture, forestry, and fishery; B.) mining and quarrying; C.) manufacturing; D.) electricity and gas; E.) water supply and sanitation; F.) construction; G.) wholesale and retail trade, vehicle reparation; H.) transportation and warehouses; I.) accommodation and food services; J.)

information and communication; K.) financial services; L.) real estate; M, N.) corporate services; O.) government administration, defense, and social security; P.) education services; Q.) health services and social activities; R, S, T, U.) other services (Badan Pusat Statistik, 2016).

The data analyzed by the Location Quotient (LQ) method. However, the results are not entirely going to be interpreted in this study. Only that has an important implication will be interpreted. The result presented in table 2 below:

Table 2. LQ Value of Provinces of Java Island

Sectors	Provinces					
	Jakarta SCR	Banten	West Java	Central Java	East Java	Yogyakarta SR
A.	0,012	0,815	1,072*	1,898*	1,535*	1,197*
B.	0,074	0,301	0,796	1,041*	2,432*	0,256
C.	0,414	1,185*	1,507*	1,198*	1,060*	0,443
D.	0,976	2,888*	1,101*	0,334	0,845	0,483
E.	0,569	1,321*	1,079*	0,954	1,325*	1,362*
F.	1,182*	0,996	0,839	1,029*	0,921	1,081*
G.	0,988	0,858	0,973	0,909	1,162*	0,515
H.	0,924	1,646*	1,216*	0,897	0,750	1,342*
I.	1,169*	0,587	0,641	0,788	1,298*	2,283*
J.	1,624*	0,842	0,606	0,725	0,833	1,584*
K.	2,208*	0,587	0,499	0,545	0,511	0,742
L.	1,796*	2,496*	0,366	0,534	0,486	2,025*
M, N.	2,978*	0,373	0,162	0,142	0,281	0,413
O.	1,432*	0,662	0,721	0,944	0,793	2,676*
P.	1,296*	0,862	0,790	1,101*	0,746	2,448*
Q.	1,521*	1,136*	0,762	0,804	0,624	2,416*
R, S, T, U.	1,644*	0,649	0,923	0,733	0,600	1,156*

Note: the data was processed with Excel. The sector is considered a base sector if LQ > 1, a non-base sector if LQ < 0, and LQ = 1. The (*) sign indicates LQ > 1. A province could have more than one base sector. There is no LQ = 1 in this result.

Table 2 above shows that Yogyakarta SR and Jakarta SCR are the provinces that have the most base sectors with 11 and 10 base sectors, respectively. On the other hand, West Java and Central Java only have five base sectors, the least among other provinces. Like the other studies that analyze a leading sector in Indonesia's region, The majority of provinces have agriculture as a base sector, except for Jakarta SCR and Banten (Kembauw *et al*., 2015; Mangilaleng *et al*., 2015; Mulyono & Munibah, 2016; Priana, 2016; Raqib & Rofiuddin, 2018). On the other hand, no provinces excel at financial services and corporate services except Jakarta SCR. Jakarta SCR is the capital city of Indonesia. The data have shown that Jakarta SCR's base sector is dominated by a modernized sector such as information and communication, financial services, corporate services, and real estate rather than traditional sectors such as agriculture, and mining and quarrying.

Referring to Rostow's five stages of economic development theory, which consist of: 1.) traditional society; 2.) precondition to take-off; 3.) take-off; 4.) drive to maturity; and 5.) age of high mass consumption (Todaro & Smith, 2011), Jakarta SCR and Yogyakarta SR are already in the fifth stage. It is shown by the amount of

the services sector that became a base sector in a province. Meanwhile, other provinces still in a third stage that emphasizes industrial sectors.

West Java, with an LQ value of 1,507, excels the most compared to the other provinces in the manufacturing sector. It is because those two cities in West Java set their minimum wage bigger than other cities in West Java. The minimum wage in Karawang regency and Bekasi city in 2019 reached Rp4,6 Million (Katadata, 2019). Recent studies have shown that a higher wage could increase employment from the supply side of a market (Mankiw, 2016). Karawang regency and Bekasi city that is also known as an industrial area, have become the first target for the workers around Indonesia to find a job. A more significant input factor generates higher production activities that could put a manufacturing sector in West Java as a base sector relative to other provinces of Java Island.

On the other hand, Jakarta SCR does not have that kind of performance in its manufacturing sector. However, they can import it from West Java instead of trying to do it themselves. Jakarta SCR and West Java are adjacent ones and another. Karawang regency and Bekasi city, which have been a center of the manufacturing sector in West Java, are geographically close to Jakarta SCR. The closer distance could make the trading process between the two regions easier.

According to Statistics Indonesia, some sectors also have several sub-sector. In this case, the manufacturing sector has sixteen sub-sectors which classified as C1.) coal and oil and gas refinery industry; C2.) food and beverage industry; C3.) tobacco processing industry; C4.) textile and apparel industry; C5.) leather product and footwear industry; C6.) wood, cork, bamboo, and rattan product industry; C7.) paper and printing industry; C8.) chemical, pharmaceutical, and traditional medicine industry; C9.) rubber and plastic product industry; C10.) non-metallic mineral product industry; C11.) basic metal industry; C12.) metal, computer, electronic, optical, and electrical equipment industry; C13.) machinery equipment industry; C14.) transportation equipment; C15.) furniture industry; C16.) repair and installation services of the machinery and equipment industry (BPS, 2019).

In Table 2, it is known that West Java has the best performance in the manufacturing industry. However, it still unknown what kind of manufacturing became the best base sector among sixteen sub-sectors in West Java. Table 3 presented the result of LQ analysis among sixteen sub-sectors of the manufacturing sector in West Java:

Table 3. LQ Value of Sub-Sector of Manufacturing Sector in West Java

Sub-Sectors	Manufacturing Sector in West Java
C1.	0,859
C2.	0,529
C3.	0,041
C4.	1,740*
C5.	0,860
C6.	0,274
C7.	0,686
C8.	0,726
C9.	1,060*
C10.	0,628
C11.	0,882
C12.	1,944*
C13.	2,699*
C14.	1,378*
C15.	0,272
C16.	1,084*

Note: the data was processed with Excel. The sub-sector is considered a base sub-sector if LQ > 1, a non-base sub-sector if LQ < 0, and LQ = 1. The (*) sign indicates LQ > 1. A province could have more than one base sub-sector. There is no LQ = 1 in this result.

The base sub-sector with the best performance among the manufacturing sector in West Java is the machinery equipment industry. It is shown by the highest LQ value of 2,699. From this result, this study argues that West Java has the best performance in the manufacturing industry compared to the other provinces in Java Island. Specifically, the machinery equipment industry is the most productive sub-sector in West Java.

In other sectors, Banten province has the best real estate sector compared to other provinces. It is proved by the LQ value as high as 2,469, which is the highest among all provinces. Jakarta SCR, the capital city of Indonesia that offers an opportunity for the labor force around Indonesia to work and create a better life, has to provide a lot of housing to accommodate the workers. Hence, the price of housing increases. Therefore, the labor who works in Jakarta SCR is looking for housing in a region around Jakarta SCR, including Banten. That is why Banten lead a housing sector over other provinces.

Banten province contains four cities and four regencies. Since Banten province has real estate as a base sector, Table 4 below provided the exact city or regency of where the housing excels:

Table 4. LQ Value of Real Estate Sector in Cities and Regencies in Banten Province

Cities & Regencies	LQ Value for Real Estate Sector
Tangerang City	0,777
South Tangerang City	2,109*
Serang City	1,157*
Cilegon City	0,744
Tangerang Regency	0,985
Serang Regency	0,607
Pandeglang Regency	0,982
Lebak Regency	0,857

Note: the data was processed with Excel. The sector is considered a base sector if LQ > 1, a non-base sector if LQ < 0, and LQ = 1. The (*) sign indicates LQ > 1. A province could have a real estate as a base sector in more than one city or regency. There is no LQ = 1 in this result.

The result shows that South Tangerang City has a better real estate sector in Banten Province. It makes sense since South Tangerang City is the closest city to Jakarta SCR. The workers in Jakarta SCR who cannot afford to buy a house or apartment in Jakarta SCR move to South Tangerang City instead. The base sector for real estate in South Tangerang City cannot be separated from the fact that the land use for housing increases every year.

Table 5. Residential Land Use in South Tangerang City, Banten

Year	Residential Land Use (ha)
2014	12,382
2015	12,561
2016	12,663
2017	12,552
2018	12,976

Note: the data was obtained from the agricultural survey publication by Statistics Indonesia 2014 to 2018 (BPS Banten, 2014, 2015, 2016, 2017, 2018). The unit of data is in a hectare.

Table 5 shows that the land use dedicated to housing increases every year in South Tangerang City. It became one of the reasons why real estate became a base sector in Banten, especially in South Tangerang City.

Among all sectors in Indonesia, the agriculture sector is considered the most important sector of all. Agriculture is tightly related to the primary needs of the people to fulfill their daily intake of food (Haris et al., 2017; Hayati et al., 2017; Widyawati, 2017). However, not all provinces good at agriculture. Table 2 shows that agriculture in Jakarta SCR and Banten province is a non-base sector. Therefore, they have to import it from other provinces of Java Island. It also applies to all sectors. Every province of Java Island has its advantage and disadvantage. However, it does not mean that they cannot enjoy the sector that they do not excel in. Hence, it is essential for all local governments in Java Island to know and understand the potential of their neighboring region to figure out further how to fulfill the needs of all people of Java Island by themselves before obtaining it from other sources.

CONCLUSION

GDRP is a machine to accomplish economic development in a region. The local government often takes part in increasing the GDRP to achieve the well-being of the people. To optimize the limited amount of budget, the provincial government has to understand what sectors that could bring the most benefit to the economic agents. This study aims to do just that by analyzing the leading sector with Location Quotient (LQ) analysis. Many studies examined the leading sector, only from one point of view. This study contributes by using a more comprehensive analysis. This study uses Java Island as a scope and analyzes the leading sector from all provinces' perspectives with the hope that it will give a more meaningful implication for policymakers.

The main result indicates that Yogyakarta SR and Jakarta SCR have the best performance compared to the other provinces in Java Island in terms of the amount of base sector owned. All provinces except for Jakarta SCR and Banten leading the agricultural sector, while Jakarta SCR is leading the more modernized sector, such as the information technology sector and the services sector.

Every province has its advantage and disadvantage. This study encourages local governments of Java Island to collaborate and communicate with each other to independently strengthen Java Island's economy. All local governments suggested fulfilling the needs of their province with the goods produced in Java Island by other provinces before buying an imported product from abroad.

Future researchers are encouraged to analyze the leading sector in other regions in Indonesia with the more disaggregated sub-sector and the latest statistical data. Methodically, Location Quotient (LQ) analysis is not only applied to analyze the leading sector. It could be used to analyze other matters related to the location-based analysis. For example, LQ could also be employed to analyze a crime (Temurcin & Dziwornu, 2016), health care facility (Abdullahi & Abdullahi, 2019), and accident in a region (Tseng *et al*., 2017).

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