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Location Quotient Analysis to Facing Competition in The Pandemic Era Of Covid-19 (Case Study: East Java Province)

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Abstract

The COVID-19 pandemic has had a significant impact on the order of people's lives. Apart from the health sector, the economic sector is also affected so that a balanced and well-targeted policy is needed to overcome this impact. Large-Scale Social Restrictions (PSBB) which were implemented to reduce the rate of transmission of COVID-19 causes economic activity, both production, consumption and distribution to be hampered, causing an economic contraction. The national economy contracted by 5.32 percent (y-o-y) and the economy of East Java contracted 5.90 percent (y-o-y) in the second quarter of 2020. Even so, there are several economic sectors that still have good performance and have contributed greatly to East Java's Gross Regional Domestic Product. Using of Location Quotient (LQ) analysis in this study aims to identify basic sectors and formulate the composition and shift of the basic sectors by using GRDP as an indicator of regional growth.

Keywords: *Location Quotient, Klassen Typology, Economic sectors, Regional economy*

Background

The Covid-19 pandemic that hit Indonesia caused an economic slowdown, including in East Java. Until now, efforts and preventive measures have not been found to stop the spread of the virus. Control measures carried out with Large-Scale Social Restrictions/*Pembatasan Sosial Berskala Besar* (PSBB) must really be able to minimize the impact on the health care system (Raoult, Zumla, Locatelli, Ippolito, & Kroemer, 2020). However, it is unclear whether similar measures should be taken by regions with a lower number of sufferers ersonbecause each region has a different response in dealing with the spread of Covid-19.

Sosa and Sosa (2020) mention several factors that can affect the spread of a pandemic which may complicate modeling, so that it will be more difficult to predict. First, the coronavirus that has been genetically identified has turned out to be the most aggressive and infectious. Researchers have even noted that it's unclear whether viruses follow the same pattern in different regions. Second, environmental factors, air humidity, and temperature are relevant in determining the transmission and stability of viruses

to the human respiratory system, such as SARS-Cov2 (Chan et al., 2011; Pica & Bouvier, 2012). Therefore, the diversity of environmental conditions will determine the dynamics of a pandemic in various regions in Indonesia. Third, older age and patients with heart problems are always associated with a higher risk of death (Shi et al., 2020). Fourth, the corona virus spreads through close interaction with people who have been infected through contact with droplets of saliva, gusts of air, and coughs containing the corona virus (Heymann & Shindo, 2020). Thus, public action needs to be designed to reduce the mobility of a person in spreading disease. However, this action is closely related to the economic impact, as well as the social and cultural changes of a person (Sosa & Sosa, 2020).

Among the several changes, one of the changes that has an impact on the economy is the change in the consumption pattern of the people. Public consumption of basic goods is not affected by the price level due to risk factors and concerns that affect consumer psychology (Hutauruk, 2020), while public consumption of tourism and transportation has decreased due to the implementation of PSBB (Sari, 2020; Ubaidillah & Aji, 2020). On the other hand, Indonesian people's savings are still growing, as evidenced by the growth of Third Party Funds (DPK) in the savings component of 10.2 percent (year-on-year) in April compared to 9.5 percent in both last March and 8. 11 percent in February (Badan Pusat Statistik, 2020). This shows that people tend to be careful in consuming and preparing funds to deal with pandemic conditions that are still uncertain.

Of all the factors that cause the spread of the corona virus, as a whole it will have an impact on social inequality, poverty, malnutrition, lack of clean water, as well as the lack of readiness of public infrastructure and government budgets in dealing with the pandemic. As a result, it significantly increases a person's risk of infection and the risk of morbidity during a pandemic (Madhav et al., 2018). In its calculations, the parametric model is unable to take into account the collective factors that can change the dimensions and impacts that occur during a pandemic. Focus on economic side, it is maximally developed can be an advantage for the region. By maximizing economic activity in potential sectors, it is hoped that these sectors can develop into basic sectors. This effort was made in order to increase East Java's GDP. This is due to the emergence of specialization in accordance with the leading sectors or sub-sectors and can be used to increase the effectiveness and efficiency of society in carrying out economic activities. To encourage maximum action, there needs to be a role for local government in supporting the management of regional economic potential to make it more potential.

In this study, we used a non-parametric model to understand the dynamics of regional economic conditions during a pandemic using a Location Quotient (LQ) to account for problems that occurred during a pandemic. This study aims to analyze sectors in East Java's GDP which are still in the advanced category and have the potential to develop. These two sectors have great opportunities to develop in supporting GRDP growth if their performance is supported by the government, stakeholders and the community as actors in economic activities in East Java.

Methodology

In this study, the Location Quotient (LQ) method is used to assess economic conditions and identify specializations / bases of economic activity. The LQ value can be used to determine the basic sector, namely sectors that still have high productivity and can support the growth of other sectors during a pandemic. The data used in this LQ analysis is the Gross Regional Domestic Product (PDRB) of East Java Province according to employment in Quarter I-II 2020 based on constant prices 2010. The formula for calculating LQ with the GRDP variable is as follows:

$$LQ = \frac{X_{ij}/RV_j}{X_i/RV}$$

Where:

LQ = Index / Location Coefficient Quotient for sector i in province j

X_{ij} = GRDP sector i in province j

X_i = GRDP sector i at the national level (reference area)

RV_j = Total GRDP in province j

RV = Total GRDP at the national level (reference area)

The criteria for decision making based on the interpretation of the LQ Index are as follows (Arsyad in Wiratama, Diartho, & Prianto, 2018):

a. If the LQ of a sector (i)> 1, then the production sector (i) is a profitable base sector to develop
b. If the LQ of a sector (i) = 1, then the production of sector (i) is only able to meet local needs
c. If the LQ of a sector (i) <1, then the production of sector (i) is a non-base sector that is less profitable

. This study also uses the Klassen typology approach to describe the pattern and regional economic growth. According to Leo Klassen in (Ragiliawan, Saputri, & Nuraeni, 2018) this analysis is used to determine the patterns and structures of regional economic growth. Klassen's typology technique can also be used to describe the pattern and structure of regional sectoral growth. This analysis can identify the position of the economic sector of a region (province) by paying attention to the economic sector in a wider area as a (national) reference area. Klassen typology produces four sector classifications with the following characteristics (Ragiliawan et al., 2018):

Tabel 1: Regional Sector Growth Patterns and Structures According to Klassen Typology

Contribution to GRDP (sk)	**GRDP Growth (s)**	
	$s_i > s$	$s_i < s$
$sk_i > sk$	**Quadrant I** Sector is developed and grew rapidly (developed sector)	**Quadrant II** Advanced but depressed sector (stagnant sector)
$sk_i < sk$	**Quadrant III** Potential and still evolving sector (developing sector)	**Quadrant IV** Relatively left-behind sector (underdeveloped sector)

Result and Discussion

Based on the results of the LQ analysis, the following is the specialization / basis of economic activity in East Java Province:

Tabel 2: LQ Value of East Java Economic Sectors

Economic Sector		2010 Constant Price		Location Quotient (LQ) Value			
		Q1-2020	Q2-2020	Q1-2020	Q2-2020	LQ Value Average	Category
A	Agriculture, Forestry, and Fisheries	37,2	47,4	0,763	0,847	1,186	Basis
B	Mining and Quarrying	21,3	18,2	0,702	0,631	1,017	Basis
C	Processing Agency	125,1	115,1	1,460	1,456	2,188	Basis
D	Electricity and Gas Supply	1,1	1,1	0,263	0,289	0,407	Non-Basis
E	Water Supply, Waste Management and Recycling	0,4	0,4	1,150	1,166	1,733	Basis
F	Construction	38,1	35,4	0,921	0,936	1,389	Basis
G	Wholesale and Retail Trade; Auto and Motorcycle Repair	75,3	68	1,399	1,372	2,085	Basis
H	Transportation and Warehousing	11,9	8,6	0,703	0,727	1,066	Basis
I	Accomodation; Food and Beverage	22,7	18,5	1,814	1,929	2,778	Basis
J	Information and Communication	25,2	26,8	1,069	1,114	1,626	Basis
K	Financial and Insurance Services	10,5	10	0,575	0,620	0,885	Non-Basis
L	Real Estate	7,3	7,3	0,598	0,607	0,901	Non-Basis
M,N	Corporation Service	3,3	2,8	0,417	0,417	0,625	Non-Basis
O	Govermental Administration, Defense, and Mandatory Social Security	8,7	8,8	0,636	0,670	0,971	Non-Basis
P	Education Service	11	11	0,866	0,884	1,308	Basis
Q	Health and Social Service	2,9	3	0,566	0,619	0,875	Non-Basis
R,S,T,U	Other Services	5,9	3,8	0,745	0,572	1,031	Basis
GRDP Total		**408,6**	**386,3**				

(**Source**: BPS (2020), processed)

Basic sectors that support the economy in East Java, including agriculture, forestry and fisheries; mining and excavation; processing industry; water supply, waste management, waste and recycling; construction; wholesale and retail trade; car and motorcycle repair; transportation and warehousing;

providing accommodation and food and drink; information and communication; education services; and other services. Meanwhile, the rest is included in the non-basis sector category. In addition to LQ data, based on the GRDP data of East Java Province, it can also be found business categories from the Klassen's Typology analysis of the business fields in East Java Province as follows:

Tabel 3: Category of East Java's Economic Sectors According to Klassen's Typology

Economic Sector	GRDP Growth Rate (per Economic Sector of East Java) (Si) (%)	GDP Growth Rate (per Economic Sector of Indonesia) (S) (%)	Sector's Contribution to East Java GRDP (Ski) (%)	Sector's Contribution to National GDP (Sk) (%)	Category
Agriculture, Forestry, and Fisheries	21,519	13,973	10,643	13,181	Potential and Still Evolving
Mining and Quarrying	-17,033	-3,890	4,969	7,446	Relatively Left-Behind
Processing Agency	-8,688	-6,924	30,218	20,721	Advance but Depressed
Electricity and Gas Supply	0	-8,627	0,2768	1,005	Potential and Still Evolving
Water Supply, Waste Management and Recycling	0	0	0,101	0,087	Advanced but Depressed
Construction	-7,627	-7,929	9,246	9,959	Potential and Still Evolving
Wholesale and Retail Trade; Auto and Motorcycle Repair	-10,735	-7,194	18,027	13,005	Advanced but Depressed
Transportation and Warehousing	-38,372	-41,236	2,579	3,614	Potential and Still Evolving
Accomodation; Food and Beverage	-22,703	-28,771	5,183	2,779	Advanced but Depressed
Information and Communication	5,970	3,286	6,542	5,995	Developed and Grew Rapidly
Financial and Insurance Services	-5	-11,553	2,579	4,325	Potential and Still Evolving
Real Estate	0	-0,248	1,837	3,049	Potential and Still Evolving
Corporation Service	-17,857	-16,444	0,767	1,840	Advanced but Depressed
Goverment Administration, Defense, and Mandatory Social	1,136	-2,724	2,202	3,375	Potential and Still Evolving

Security					
Education Service	0	-0,719	2,768	3,163	Advanced but Depressed
Health and Social Service	3,333	-4,308	0,742	1,255	Potential and Still Evolving
Other Services	-55,263	-17,753	1,220	1,831	Relatively Left-Behind

(Source: BPS (2020), processed)

The results of an analysis of the East Java economy during the pandemic using LQ and Klassen's Typology, it is known that most sectors are in quadrant II with a category that can still develop and respond to current conditions. Sectors that can survive a pandemic include agriculture, forestry and fisheries; electricity and gas supply; construction; transportation and warehousing; financial and insurance services; government administration, defense and mandatory social security; as well as health services and social services. On the other hand, sectors in the relatively underdeveloped category, namely mining and quarrying and other services.

In the East Java economy, the information and communication sector has experienced quite advanced growth. This is supported by the high need for information and communication to support community productivity. The actual restrictions have not affected the growth of the information and communications sector, because as the labor force shifts to work from home and students turn to online learning, the demand sector is experiencing an unprecedented surge. Increased productivity builds to develop services in the information and communication sector (Yu, Aviso, Santos, & Tan, 2020). Therefore, it is important for the East Java Provincial Government to develop facilities and services so that this sector can grow and contribute to encouraging regional economic growth.

Meanwhile, matters that need to be developed to support social activities during a pandemic are health services and social activities, as well as government administration, defense and mandatory social security. The health service sector is experiencing inability to operate due to the high exposure to Covid-19 which is difficult to control and the risk of transmission is still high. For companies with employees exposed to Covid-19, they will issue active workers to carry out independent isolation. Meanwhile, a downturn in the labor market reinforces declining incomes in times of the pandemic. Informal workers do not have access to health insurance which has led to the emergence of cash transfer programs to cope with the impact of the pandemic (Lustig & Tomassi, 2020) . Furthermore, the poor are very limited in jobs that can be done remotely, considering that the lack of infrastructure (internet connection) predisposes them to isolation at home. Given that the poor do not have the means to meet basic needs.

Therefore, poverty alleviation and response to the high impact of morbidity during a pandemic, in these two sectors need to be improved. Fiscal policies and social assistance funds have been issued to alleviate poverty and the impact of morbidity, so that its management needs to be implemented optimally so that it can have a positive impact on society, as well as support the regional economy. This is intended to protect health and people's lives, jobs, human capital and economic growth. To overcome the

deterioration of various sectors during the pandemic and overcome the impact of losing people's income as a result of changing economic conditions, the government must expand the cash transfer assistance program (Lustig & Tomassi, 2020). This type of cash assistance not only reduces people's economic vulnerability, but can boost productivity at work, as well as increase community health and education capacity.

We need to learn from China, a social protection system that is more adequate and responsive to shocks and forms of sustainable financing. During the crisis during the Covid-19 pandemic, income security must provide resources for living to reduce long-term social and economic impacts. Local governments have been instructed to increase the number of national social assistance schemes for all vulnerable communities or those infected with Covid-19 (Dialogue & Protection, 2020). Social protection is an important investment, especially in order to be better prepared to face further shocks and to build a resilient society, as well as to maintain the stability of the regional economy in the long term (Dialogue & Protection, 2020). Therefore, cooperation between the government and the community needs to be increased to support the sustainability of the East Java economy, such as the allocation of targeted fiscal assistance and support for health services. The second quadrant is indeed the place that provides the majority of local employment which accounts for the majority of employment in East Java. Therefore, policy and economic development need to support the provision of human resources that are lost in some sectors to support the flow of income in this section. A strong local economy and employment are important factors that contribute to the prosperity of East Java Province.

Conclusion

In the economic development of East Java during this pandemic, proper priorities from the provincial government are needed. The results of the analysis show the agricultural, forestry and fisheries sectors; mining in supporting the economy of East Java. The information and communication sector has the most advanced growth due to the high need for information and communication to support community productivity. Especially during this pandemic, many community activities such as offices and education must be carried out remotely and online. The East Java Provincial Government is expected to develop facilities and services for this sector so that it can further develop and contribute to the economic growth of East Java. In addition, poverty alleviation through fiscal policy and social assistance funds needs to be implemented optimally in order to support the regional economy by increasing people's purchasing power and consumption. Local governments are instructed to increase the number of national social assistance schemes for all vulnerable communities in order to be better prepared to face further shocks and to build resilient communities, as well as to maintain regional economic stability in the long term. Economic development policies also need to support the provision of lost human resources in several sectors because a strong local economy and employment are important factors that contribute to the prosperity of East Java Province. This research is limited to the leading sectors of East Java's GRDP, it is hoped that further research can be more specific in various sectors so that it can be comprehensive in determining solutions in overcoming the economic problems of East Java during the Covid-19 pandemic.

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