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Industrial Aglomeration: Industrialization Of North-South In East Java Corridors

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Abstract: Industrial Aglomeration: Industrialization of North -South In East Java Corridors

Industrial agglomeration is the most prominent geographical feature of economic activity. East Java is one of the richest provinces in Indonesia that have north - south corridor industry agglomeration. In the northern region, it includes the City of Surabaya, Sidoarjo Regency, Pasuruan Regency, Mojokerto Regency, Gresik Regency, and Tuban Regency. The southern region includes Malang City, Malang Regency, and Kediri City. This study aims to discover whether industrial agglomeration is the key for region development and economic growth, especially on the East Java's north-south corridor.This study also find the absorption of labor in each region as a result of industrial agglomeration in the northern and southern regions. This study used Location Quotion (LQ) and Shiftshare analysis to be able to represent the occurrence of industrial centralization in the northern and southern corridors of East Java in the period 2011 – 2019. The results analysis show that most of the sectors that form the basis of districts/cities in the north-south corridor generally excel in the industrial, trade, and service sectors. The absorption of labor in several industrial areas in East Java in the northern and southern corridors is also required by the completeness of regional infrastructure. The implications of the research is at the sectoral level cannot yet be described in depth on the performance of other sub-sectors in these economic activities, nor can they be fully developed because there are many factors that influence the development of a region.

Keywords: Industrialization; Infrastructure; Urban; Rural; Regional Economics

INTRODUCTION

Economic development is often associated with inequality in various sectors within and around the region. The existence of industrial expansion and the idea of industrial grouping caused some areas around the industrial area to become unbalanced. According to (Sjafrizal, 2008) there are two causes of development inequality between regions, namely differences in the content of natural resources and differences in geographical conditions. The hope is that regional decentralization can ease the burden of inequality because the system used is autonomous or federal, so that more government funds will be allocated to the regions so that the inequality that occurs tends to be lower.

The expansion of the industry causes a variety of transfers of required resources. Not only in the form of production inputs but human capital will also move following the location of industrial expansion and raw materials. Sjafrizal (2008) Identified the transfer of capital in the form of money by transferring from one area to another for financing goods and services and investment. Furthermore, capital in the form of objects can be moved but is limited and will experience shrinkage or environmental changes. Meanwhile, technology transfer which is used as capital in accelerating development and directed at the accumulation of human capital and advanced technology, will make a positive contribution to efficiency and lead to economic growth (Kalaitzi, 2018).

Industrial agglomeration is the most prominent geographical feature of economic activity (Krugman, 1998). The agglomeration economy originated from the study of the agglomeration theory of external economic industry by Marshall in the 1890s (Drucker and Feser, 2012). Industrial agglomeration methods include industrial concentration, gini coefficient, location quotient, etc. Davis and Hashimoto (2014) conducted an analysis of the relationship between industrial geography and economic growth in trade patterns between two countries using industrial concentration. One method in isolation not only increases the risk of error in measuring market spatial performance but also ignores the diversity of attractive, and often offsetting, influences in the data; they combine Gini-based metrics and industry concentration to measure geographic distribution. Zheng and Lin (2018) examined the agglomeration characteristics of the paper industry using the location quotient. The above measurement method has the advantages of clear meaning, simple calculation and easy access to relevant data. Based on the competitive industry theory, industries tend to shift to areas that have similar industrial clusters, thereby gaining the competitive advantage provided by the

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development of industrial clusters (Sosnovskikh, 2017) such as maximizing access to economies of scale and external economies. coverage, technology spillover, deepening specialization, and reduced transaction costs (Taddeo et al., 2017).

Theoretically, industrial agglomeration is a spatial concentration of economic activity in urban areas with the aim of obtaining savings by having industrial locations close to the company's location, the presence of workers and consumers (Eriandy, 2021). In agglomeration areas, industrial and agricultural areas grow side by side in a close location, compete with each other and often there is a struggle for land for the needs of the two sectors. The industrial sector usually agglomerates in areas that provide the advantage of productivity, higher wages so that it can attract investors, have renewable and affordable technology for superior human resources (Novirin, 2021).

Furthermore, industrial clustering is seen as a group of companies that have the same activities in the national economy. Therefore, an important factor in industrial clusters is the relationship between companies in a sector with other sectors that support each other (Tri Wahyudi, 2008). Clusters also mean that there are vertical and horizontal ties between companies, where through these linkages it is seen as being able to provide an approach that can be used to take policies in developing industry in a region or country (Tri, 2008).

On the other hand, for areas that have grown very rapidly, such as the Jabodetabekjur megapolitan area, industrial agglomeration does not have a positive impact. The development of industrialization and clustering has caused the gap between the rich and poor to widen, income inequality and economic inequality are getting bigger, education is becoming a luxury for the lower middle class, there are many slums and inadequate sanitation due to too high population density. This causes negative externalities such as floods, traffic jams, high crime rates and high unemployment (Mauleny, 2015). Too fast industrial agglomeration also causes environmental damage because rapid economic activity can cause pollution and loss of local biodiversity (Novirin, 2021).

East Java is one of the richest provinces in Indonesia. East Java is a province that contributes greatly to the second national income in Indonesia after DKI Jakarta. This is natural because DKI Jakarta is the capital city of Indonesia as well as the center of economic activity in Indonesia (Adri and Rachman, 2018). East Java has industrial areas in the north and south. In the northern region, it includes the City of Surabaya, Sidoarjo Regency, Pasuruan Regency, Mojokerto Regency, Gresik Regency, and Tuban Regency. The southern region includes Malang

City, Malang Regency, and Kediri City. The northern region of East Java has become an industrial center since the colonial era due to its strategic location because it is directly adjacent to the Java Sea, thus facilitating distribution access to outer areas of the island of Java. In addition, the raw materials for natural resources in the northern region of East Java are sufficient. Meanwhile, the southern region was triggered by the presence of sugar factories and cigarette factories which spread in the southern region due to the vast sugarcane fields and there are several largest cigarette factories in Indonesia such as PT. Bentoel and PT. Gudang Garam. Industrialization in the northern and southern regions of East Java has a different style. The clustering that is formed indirectly in the northern and southern regions is also triggered by elements of regional proximity and similarities in regional characteristics. This has led to a connected industrialization. In addition, labor that is easily available and in accordance with the characteristics of the industry accelerates the absorption of labor and massive economic growth (Novirin, 2021). The development of the industrial sector in East Java continues to increase gradually. So far, the industrial sector has contributed greatly to the Gross Regional Domestic Product (GRDP). Industry also contributes to increasing people's income and plays a role in increasing employment. Therefore, industrial growth in a region has a major influence on developments in that region (Eriandy, 2021).

Industrial agglomeration has a crucial role in the economic development of an area or regional clustering. According to Neo Classical economic theory, the Capital-Output (COR) ratio can change. To create a certain output, a certain amount of capital can be used according to a certain composition. If more capital is used, then less labor is needed. On the other hand, if less capital is used, more labor is used. With this flexibility, an economy has unlimited freedom in determining the combination of capital and labor that will be used to produce a certain level of output. A balanced development strategy can be applied to create markets for various sectors of the economy. A balanced development strategy between sectors is able to simultaneously increase economic growth (Wahyudi, Penguatan Sektor-Subsektor Ekonomi Dalam Upaya Peningkatan Pembangunan Ekonomi Daerah, 2008).

The novelty of this research is to know how the development of industrial agglomeration in the northern and southern regions of East Java for each economic sector that forms the components of GRDP. In addition, this study also wants to know the absorption of labor in each region as a result of industrial agglomeration in the northern and southern regions. This research is expected to be able to provide suggestions for industrial agglomeration policies related to regional concentration or regional dispersion that are able to

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provide maximum output and strengthen the industry's position for its contribution to economic growth in East Java in the long term.

LITERATURE REVIEW

Agglomeration is a process that will continue to occur as long as there is growth and economic development that is influenced by location factors (Rejeki & Lubis, 2020). The new geographic economic theory proposed by Krugman seeks to reduce the agglomeration effect of the interaction between market size, transportation costs and increased firm returns. From this theory agglomeration economy is not assumed but derived from the interaction of economies of scale at the enterprise level, transportation costs and the mobility of the factors of production. The new geographic economic theory briefly emphasizes the existence of a circular causality mechanism to explain the spatial concentration of economic activity. In the classical economic theory proposed by Adam Smith, agglomeration arises because economic actors try to obtain savings, both localization savings and urbanization savings by choosing industrial locations that are close to each other. Classical economists distinguish between internal and external saving, as well as saving because of the scale and scope of economies. With regional agglomeration, the economic system formed in a region will tend to be centralized and efficient (Chen, 2015 ; Khoirunurrofik, 2017; Han et al., 2019; Rejeki & Lubis, 2020).

Industrialization has been the main driving force behind urbanization in Asia since the 1980s. Manufacturing industries tend to be located in and around cities. Agriculture and industry coexist and blur the distinction between rural and urban (Mcgee, 1991). Industry tends to cluster in areas where the potential and capabilities of the area can meet their needs and benefit from the presence of companies that are close to each other. The fact of change in this city offers various advantages such as increased productivity, higher income, renewable technology, better quality and quantity of workers (Malecki, 1991). Therefore, agglomeration is a central issue in the literature on economic geography, business strategy and increasing national competitiveness and regional studies.

On the other hand, the existence of growth areas can cause trickling down and polarization effects for economic growth (Rusdiati & Fafurida, 2016). The theory expressed by Hirschman suggests that the potential for resources that are not uniform and not evenly distributed between one region and another will lead to non-uniform economic growth as well. To be able to grow rapidly, a country needs to choose one or more regional growth that

has the strongest potential. If a regional area with strong economic growth is able to affect a region with weak economic growth, it can have a positive impact, namely the trickling down effect, namely the existence of a strong regional growth that can absorb the potential for labor in a weak region. However, another negative impact is the polarization effect that will occur if production activities in a strong region are competitive with production in a weak region, even though production in a weak region still requires guidance and support to increase its capacity (Pudjiati, 2012; Rusdiati & Fafurida, 2016; Jumino, 2019).

METHODS

The data used in this study at the provincial and district/city levels from the Central Statistics Agency (BPS) East Java in 2010-2019. The periodization in this study must have meaning for regional economic development in the study area. The analysis used in this research is to study the economic structure of each sector in the industrial cluster in the north-south region of East Java. As the basis of calculation, using LQ analysis and quantitative descriptive. Location Quotient Analysis Location Quotient (LQ) indicates where a region's comparative advantage may lie and can be calculated as the ratio of the regional share of a sector or cluster to the national share of the same sector or cluster in terms of economic activity, such as employment and number of firms (Tarigan, 2014). This analysis calculates LQ based on constant number GRDP in certain clusters and compares it with the location quotient value.

More specifically, for a given region, if the LQ of a sector in that region is greater than one, then the region is more specialized in that industry than the national average; conversely, if the LQ is less than one, the region is less specialized than the national average for the sector. The use of LQ Analysis can be expanded and consider industry dynamics by comparing changes in location quotient from time to time. According to a report from the Purdue Center for Regional Development, Indiana Business Research Center, and Strategic Development Group (2007), four categories of sectors or clusters can be identified based on LQ and changes in LQ (ΔLQ); (i) The cluster is more specialized (LQ>1) relative to the national economy and becomes more specialized over time (ΔLQ>0); (ii) The cluster is less specialized (LQ<1) compared to the national economy but becomes more specialized over time (ΔLQ>0); (iii) The cluster is more specialized (LQ>1) relative to the national economy but becomes less specialized over time (ΔLQ<0); and (iv) The cluster is less specialized (LQ<1) compared to the national economy and becomes less specialized over time (ΔLQ<0).

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Calculations using LQ can identify local production activities that need to be encouraged and related to commodities that have a large enough production capacity. This can affect the regional economy because it is related to the comparative advantage of the region concerned. Sectors that have a comparative advantage are potential sectors that can be developed as regional superior products (Sjafrizal, 2008).

The Shift Share model application aims to carry out empirical proof of *Regional Share, Proportionality Shift* and *Differential Shift* from regional economic GRDP data. An interesting aspect of this method is that the Shift Share Model can analyze economic growth according to the regional economic structure that is different from the national economy. In a national economic growth, in the neoclassical model, the elements of growth discussed are the contribution of labor, capital, and technology to economic growth. Meanwhile, aspects of the influence of the national economy, the structure of regional economic growth, and the specificities of the regions cannot be analyzed. This Shift Share model will be more in line with the structure of the regional economy than the macrostructure which is usually used to see the level of the national economy (Sjafrizal, 2008).

In another hand, the classic Shift Share model examines economic changes in a region by breaking it down into three additive components, namely: (i) reference area components; (ii) shift in proportionality; and (iii) differential shift (Dinç, 2002). The decomposed variables can be income, employment, added value, number of companies, or other variations(Haynes and Dinc, 1997). The change in the variable e in the industry model I between t and t+n can be defined as the accumulation of three types of effects of shift-share, namely; (i) national growth effect (NSi); (ii) Mix effect industry (IMi); and (iii) local share effect (RSi).

$$e_{t+n}^{i} - e_{t}^{i} = NS_1 + IM_i + RS_i$$

where:

$NS_1 = e_{it}G, refelcts\ national\ growth\ effect$

$IM_i = e_{it}\,(G_iG)\ reflects\ industry\ mixed\ effect$

$RS_i = e_{it}\,(G_iGi) reflects\ total\ share\ effect$

Considering the interpretation of the shift share analysis, it will be seen that the regional economy is exploring and identifying growth, or industrial growth potential that deserves further research (Dinç, 2002).

RESULT AND DISCUSSION

The results of the analysis carried out in the north-south study area of East Java showed that the movement of the industrial sector in the region formed a special industrial cluster.

Table 1. Analysis of the Average LQ Value

Sector	Average LQ								
	Sidoarjo	**Surabaya City**	**Pasuruan**	**Gresik**	**Malang City**	**Kediri City**	**Mojo kerto**	**Malang Regency**	**Tuban**
Agriculture, Forestry, and Fisheries	0,18	0,01	0,56	0,57	0,02	0,02	0,67	1,43	1,52
Mining and Quarrying	0,03	0,00	0,11	2,17	0,02	0,00	0,19	0,40	1,72
Processing Industry	1,69	0,65	1,95	1,67	0,86	2,73	1,82	1,01	1,06
Electricity and Gas Procurement	2,88	1,51	2,70	1,61	0,11	0,03	0,21	0,29	0,36
Water Supply, Waste Management, Waste and Recycling	0,79	1,60	0,36	0,62	2,10	0,22	0,71	1,01	0,62
Construction	1,00	1,10	1,36	0,94	1,36	0,2	0,98	1,29	1,34
Wholesale and Retail Trade, Repair of Cars and Motorcycles	0,87	1,57	0,55	0,65	1,68	0,54	0,59	1,06	0,73
Transportation and Warehousing	2,85	1,68	0,21	0,75	0,87	0,14	0,40	0,38	0,20
Provision of Accommodation and Food and Drink	0,65	2,81	0,65	0,22	0,85	0,29	0,36	0,64	0,17
Information and Communication	0,76	1,17	0,58	0,76	0,85	0,43	1,15	0,88	0,99
Financial and Insurance Services	0,46	1,89	0,30	0,43	0,94	0,37	0,57	0,63	0,77
Real Estate	0,57	1,56	0,43	0,74	0,86	0,27	0,92	0,85	0,81
Company Services	0,19	3,01	0,12	0,31	0,85	0,23	0,18	0,43	0,23
Government Administration, Defense, and Mandatory Social Security	0,79	0,58	0,50	0,51	0,66	0,16	1,05	0,81	1,03
Education Services	0,44	0,90	0,26	0,32	2,88	0,30	0,51	0,91	0,61
Health Services and Social Activities	0,50	1,19	0,23	0,58	3,85	0,27	0,60	0,90	0,77
Other Services	0,27	1,03	0,75	0,19	2,18	0,25	0,66	1,43	0,84

Source: Secondary data output after processing, 2020; (Lustina, 2020).

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Industrial activities located in the area can trigger economic growth and the pattern of industrial development will make the area a separate specialty. So that the direction can have an impact on the value added of the product and also the absorption of labor. The trigger for the existence of industry in the north - south cluster region (Tuban Regency, Malang City, Malang Regency, Pasuruan Regency, Surabaya City, Sidoarjo Regency, Gresik Regency, Mojokerto Regency, and Kediri City) is born from hinterland areas and infrastructure development. The development of infrastructure such as offices, toll roads, and the development of wages has led to the displacement and expansion of industrial activities around the location. One of the impacts is that the construction of the Surabaya – Malang, Surabaya – Gresik and Surabaya – Kediri (including Surabaya – Mojokerto) toll roads has caused a regional tug of war and a rapid movement of capital and labor flows. These locations which are connected toll roads are linked to make production activities more efficient and distribution channels of goods and services more efficient. Concentration activities on industry will continue to occur, causing the emergence of expansion of the surrounding area. This industrialization process geographically is a process that triggers uneven structural transformation in all regions and causes the emergence of spatial concentration. The formation of this spatial concentration is an effort to save agglomeration both due to location and urbanization with adjacent areas.

a. Potential Sector Analysis

However, for all of these reasons, the presence of industrial concentration can be used as a sector with great potential to be developed and maintained. The following are some of the results of mapping potential sectors, especially the industrial LQ values from districts/cities in north-south locations in East Java.

The results of the analysis in table 1 show that each sector is superior in each region in the north-south corridor of East Java. First, in the Sidoarjo area which has an LQ value > 1 only in four sectors namely, Processing Industry, Electricity and Gas Procurement, Construction, and Transportation and Warehousing. Second, the city of Surabaya almost entirely has an LQ value > 1. However, there are five sectors whose values are below LQ < 1, namely Agriculture, Forestry, and Fisheries; Mining and excavation; Processing industry; Government Administration, Defense, and Mandatory Social Security; and Education Services.

Third, Pasuruan Regency only has three sectors with an LQ>1 value, namely the Manufacturing Industry, Electricity and Gas Procurement, and Construction sectors. Fourth, Gresik Regency has three sectors with an LQ> 1 value, namely Mining and Quarrying, Processing Industry, Electricity and Gas Procurement. This fact also occurs in China, where development developments and leading spatial areas tend to converge in the same growth area (Han et al., 2019).

Furthermore, the fifth is the Malang city area that has an LQ value > 1, there are six sectors, namely, Water Supply, Waste Treatment, Waste and Recycling, Construction, Wholesale Trade, Educational Services, Health Services and Social Activities, and Other Services. Meanwhile, the city of Kediri has only one dominant sector that has an LQ> 1 value, namely the processing industry. Sixth, Mojokerto Regency has three sectors with LQ values > 1, namely the Processing, Information and Communication Industry, and Government Administration, Defense, and Mandatory Social Security. Seventh, the Malang district has 6 (six) sectors with LQ values > 1, namely, Agriculture, Forestry, and Fisheries, Processing Industry, Water Supply, Waste Management, Waste and Recycling, Construction, Wholesale and Retail Trade, Repair of Cars and Bicycles. Motorcycles, and Other Services. Finally, the eighth district, Tuban district has 5 (five) sectors with an LQ>1 value, Agriculture, Forestry, Fisheries, Mining and Quarrying, Processing Industry, Construction, and Government Administration, Defense, and Mandatory Social Security.

The results of the analysis in table 1 show that each sector is superior in each region in the north-south corridor of East Java. First, in the Sidoarjo area which has an LQ value > 1 only in four sectors namely, Processing Industry, Electricity and Gas Procurement, Construction, and Transportation and Warehousing. The processing industry in Sidoarjo Regency has always been proven to make a significant contribution to East Java's GDP every year. Muljanto (2021) also stated the same thing related to the leading sector in Sidoarjo Regency that from 2016-2020 the manufacturing industry sector, the electricity and gas procurement sector as well as the transportation and warehousing sector were the leading sectors in the Regency. The increase in economic activity in the free sector is able to increase regional income which in turn increases the demand for goods and services from the non-basic sector. Thus, the role of the basic sector can be a driving force for other non-base sectors to move forward. This is also in line with the findings Zhu, et al., (2019) which states that

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industrial agglomeration results in the transfer of net profit factors from adjacent areas to local areas. Apparently, inventories with core values are widely regarded as a factor of producer advantage (Bradley et al., 2011 and Steven, et al., 2015).

Second, the city of Surabaya almost entirely has an LQ value > 1. However, there are five sectors whose values are below LQ < 1, namely Agriculture, Forestry, and Fisheries; Mining and excavation; Processing industry; Government Administration, Defense, and Mandatory Social Security; and Education Services. The number of sectors that have an LQ value > 1 is because the economic system in the city of Surabaya is already well established. Research conducted by (Hariyoko & Puspaningtyas, 2020) shows that there are 11 leading sectors out of 17 sectors that are components of Surabaya City's GDP. The sectoral development in the city of Surabaya has been carried out by providing a Regional Development Orientation (OPD) in accordance with the needs of regional development. This is very important because each region has different potential in community development. In planning the economic development of the City of Surabaya, it has been included in the strategic issues of the RPJMD, but unfortunately it is still unknown which sector will be the focus of development in the sector that is used as competitiveness.

Third, Pasuruan Regency only has three sectors with an LQ>1 value, namely the Manufacturing Industry, Electricity and Gas Procurement, and Construction sectors. Mahaesa et al. (2022) also suggests that the leading sector of Pasuruan Regency is the manufacturing industry. By knowing this, the government can optimize the industrial sector to become a leading sector and development in the region can be increased. Large companies can see an increase in inventory performance as industry agglomeration increases. It can be explained that the relative level of inventory will decrease when the size is large enough with additional available inventory (Kovach et al., 2015; Chung, Singh and Lee, 2000; Wagner, 2003). In addition, large companies enjoy economies of scale, as they can collect customer requests from different locations (Koufteros, et.al, 2010). For small companies, however, industry clusters have a crowding effect on inventory performance in the local area as well as in general.

Fourth, Gresik Regency has three sectors with an LQ> 1 value, namely Mining and Quarrying, Processing Industry, Electricity and Gas Procurement. This fact is in accordance

with previous research revealed by (Prahardika, 2015) which stated that the leading sector. in the Mining and Quarrying Gresik Regency. Gresik Regency has natural resources in the form of limestone mountains and BUMN PT Semen Gresik, so this has triggered the sector to become the leading sector in the district. If the sector is developed, it can become a leading sector and increase profits for Gresik Regency in the future. These findings indicate that mining agglomeration directly increases energy productivity. Also, there is a nonlinear relationship between mining agglomeration and energy productivity. In particular, the positive impact of mining agglomeration is only at a certain level of economic development. Furthermore, on average, Africa's total mining energy productivity increases over the sample period, but its performance differs between economic regions. The findings of this study support the view that policymakers should re-enforce, enhance, and adopt innovative cluster development strategies and investor-friendly elements in regional mining codes (Lin and Sai, 2022). However, this result is not in accordance with the research conducted by Li, Wu and Gao (2020) because agglomeration can reduce eco-efficiency carried out in a mining area. This is what the government needs to consider so that there is a balanced plan between agglomeration and regional growth as well as environmental sustainability.

Furthermore, the fifth is the Malang city area that has an LQ value > 1, there are six sectors, namely, Water Supply, Waste Treatment, Waste and Recycling, Construction, Wholesale Trade, Educational Services, Health Services and Social Activities, and Other Services. Dzakiyah, (2021) Malang City has leading sectors including water supply sector, waste management, waste recycling, Education sector and Health Sector and social activities. The advantages of these sectors are triggered by the geographical condition of the city of Malang which still has clean springs to be used for the needs of the community who come from the mountains around the city of Malang. In addition, Malang as a student city has a positive influence on the growth of education. In addition, the existence of a general hospital that is a reference in the province of East Java makes the health sector in Malang City also very good. The availability of Central Health Community (Puskesmas) with very good standards makes the health sector quite dominant for the region. This is similar to the results Wagner, (2003) showing that compared to large firms, although not significant, small firms are more flexible and highly enjoy sharing natural resources and stable relationships across clusters, which resemble the findings (Rigby and Brown, 2015). Howell, et al. (2016) one potential explanation might be that firms possessing a range of resources, in this case the firm's status

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in the supply chain, may benefit from the general agglomeration economy.

Meanwhile, the city of Kediri has only one dominant sector that has an LQ> 1 value, namely the processing industry. The high LQ value in the processing industry is influenced by the existence of the PT Gudang Garam cigarette factory. (Basito, Riniati and Viphindrartin, 2019) The LQ value in the region is influenced by the market leader owned by the City of Kediri and the larger production contribution compared to the urban districts in East Java as evidenced by the tobacco industry of Kediri City having a production contribution of 60-63% of industrial production. tobacco in East Java. Industrial agglomeration is generally regarded as a source of sustainable competitive advantage for the regional economy (Massimino, Gray and Boyer, 2017) and. Diodato, et.al, (2018) The company can enjoy the positive externalities of reduced transaction costs, knowledge transfer and development of the inventory pawning business to improve inventory performance in adjacent areas. Concretely, large companies can see an increase in inventory performance as industry agglomeration increases. It can be explained that the relative level of inventory will decrease when the size is large enough with additional available supplies (Chung, et.al, 2000 and Kovach et al., 2015).

Sixth, Mojokerto Regency has three sectors with LQ values > 1, namely the Processing Industry; Information and Communication Industry, and Government Administration, Defense, and Mandatory Social Security. Research conducted by (Irmansyah, 2019) shows that in Mojoketo Regency, which is included in the leading sector, it is the manufacturing industry which contributes greatly to income. This shows that there is a fairly good shift where in this study the sector that has an LQ value > 1 has 3 sectors. Over time, the information and communication sector as well as government administration, defense and Health and social services developed very well to become the basic sector in the current year.

Seventh, the Malang district has 6 (six) sectors with LQ values > 1, namely, Agriculture, Forestry, and Fisheries, Processing Industry, Water Supply, Waste Management, Waste and Recycling, Construction, Wholesale and Retail Trade, Repair of Cars and Bicycles. Motorcycles, and Other Services. This is also in accordance with Rachman (2018) which states that the basic sectors in Malang Regency are the agriculture, forestry and fisheries sectors; processing industry sector; water supply sector, waste management, waste recycling; construction; wholesale and retail trade, repair of cars and motorcycles and other service sectors. This fact is

based on the geographical location of Malang Regency which has very wide highlands and lowlands so that it triggers these sectors to develop very well. In addition, the performance of the government, universities and society tend to have a positive effect on industrial agglomeration in a region. With the activities between the 3 institutions, it is able to increase entrepreneurship and tourism so as to increase the economic independence of a region as happened in Taiwan (Chen, 2015).

Finally, the eighth district, Tuban district has 5 (five) sectors with an LQ>1 value, namely, Agriculture, Forestry, Fisheries, Mining and Quarrying, Processing Industry, Construction, and Government Administration, Defense, and Mandatory Social Security. Similar to previous research written by Andayani, et.al, (2021) the economic potential in gray hair Regency during 2015-2019 was the most prominent in the manufacturing sector, where every year there was a significant increase and increase. The agricultural, forestry and marine sectors also make a high contribution to the GRDP in Tuban Regency after the processing industry. In summary, firm status with relative position in the supply chain, was found to positively moderate the relationship between industry agglomeration and inventory performance. This is similar to the findings Cainelli, et.al, (2014) so that the relative level of firm status shapes behavior and outcomes between firms.

Generally, the leading potential in East Java is generally the same as that expressed by Haryanto, (2021) which states that the economic sectors in East Java that have an LQ value > 1 include Agriculture, Forestry, and Fisheries; Mining and excavation; processing industry; water supply, waste management, waste and recycling; repair of cars and motorcycles as well as providers of accommodation and food and drink. In addition, Haryanto, (2021) also revealed that East Java's economic sectors that have an LQ value < 1 include electricity and gas procurement; Wholesale and retail trade, transportation and warehousing construction; Information and Communication; Financial and Insurance Services; Real estate; company services; Mandatory government administration, defense and social security; Education services; Health services and social activities and other services. Therefore, the productive efficiency and economies of scale effects of the service industries should be strengthened, and timely monitoring the urban expanding and industrial performance should be given careful attentions, for timely adjustment and adaptation to the introduction and application of any new technologies (Han, et.al, 2019). On the other hand, there are 2 sectors that experienced a

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significant decline, namely Electricity and Gas Procurement, and Information and Communication. The two sectors are deemed insufficient to meet the domestic needs of East Java, so it is necessary to import the two sectors from different regions.

b. Industry Concentration Analysis

Industry concentration is a situation that shows the degree of market dominance by industrial companies in the market. Each type of market structure has a different degree of concentration of market share depending on the type of market structure owned (Firmansyah, et.al, 2017). Industrial concentration has a close relationship with efficiency. The concentration of industry causes the distribution process and industrial development to be faster. Industries with good performance are able to continue operating in the future. Efficiency is one of the performance indicators of how output and changes in costs are needed for changes in output (Firmansyah, et al., 2015). This is consistent with broader findings of a positive correlation between industrial clusters and productivity growth (Henderson, 2003; Greenaway and Kneller, 2008; Bradley et al., 2011; Howell et al., 2016; Rosenthal and Strange, 2004; Ning, et.al, 2016; Cainelli, et.al, 2014; Power, et.al, 2019; Shockley et al., 2015).

Based on these results, in the north-south region that has an LQ value < 1 for industry, only Surabaya and Malang cities. The value of each LQ from the two regions is 0.65 for Surabaya and 0.86 for Malang. This shows that the economy of the cities of Surabaya and Malang is relatively the same as East Java and indicates that the two cities are not specialized (Ma'rif & Wilantari, 2020). Adisasmita, (2014) Meanwhile, the one with the largest LQ value for the industry is the City of Kediri, which is 2.73. The magnitude of the LQ value in the industrial sector in the city of Kediri cannot be separated from the role of PT. Gudang Garam Tbk makes a great contribution to the region and society in all social and economic aspects.

The entire sector in the north-south corridor, the sector that dominates and is present throughout the region is industry. This phenomenon confirms that there is spatial concentration in the north-south corridor (Surabaya – Malang and Surabaya – Tuban). The existence of such industrial concentration when viewed from Alfred Webber's theory of determining the location, then these areas use the Least Cost Theory which determines the location based on 3 (three) factors, namely transportation costs, wage differences, and

agglomeration. First, transportation costs can be the most significant factor in reducing input costs and distribution channels. The ease of toll roads from infrastructure development can shorten the time, distance, and minimize transaction costs that occur during the delivery of raw materials for production and distribution of outputs.

Table 2. Labor Absorption in the North-South Corridor

No	Area	Labor (2019)	
		Total	**Percent**
1	Kediri City	142.122	0,67
2	City of Surabaya	1.499.094	7,12
3	Malang city	437.737	2,08
4	Malang Regency	1.386.930	6,59
5	Sidoarjo Regency	1.120.482	5,32
6	Pasuruan Regency	829.988	3,94
7	Mojokerto Regency	588.987	2,80
8	Gresik Regency	633.270	3,01
9	Tuban Regency	627.296	2,98
	Total	7.265.906	34,54

Source: Secondary data output after processing, 2020 (Lustina, 2020)

During 2019, the absorption of labor in East Java was 21,032,612 people. So, if the nine regencies/cities in East Java in the north-south corridor area for the processing industry, the total workforce absorbed is 34.54 percent with the largest percentage in the city of Surabaya, which is 7.12 percent. While the lowest percentage is the city of Kediri with a percentage of 0.67 percent. However, the city of Kediri has a very large contribution of 58%-60% in the 2013-2017 period which comes from the cigarette factory of PT. Gudang Garam. Tbk. This spatial concentration is in accordance with what was conveyed by (Ma'rif & Wilantari, 2020) which is concentrated in the city of Surabaya, Gresik district, Sidoarjo district, Kediri city, Pasuruan district, and Malang city and there is an additional district of Tuban. If it is related to the research time span of 16 years, there will be additional areas other than those mentioned above. Of course, during the span of the year the provincial and regional governments carried out industrial development so that the research results were different. Another reason for the concentration of industry in the north-south corridor is the ownership of complete infrastructure so as to provide benefits to the industry in terms of access and ease of distribution of production inputs and outputs. In accordance with what was stated by Glaeser

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and Kohlhase, (2004) that industry will tend to be concentrated in areas that have complete infrastructure.

Meanwhile, Shift Share analysis is used to determine the development of a sector in a region relatively quickly or slowly in each sector. This analysis has an approach by determining the work productivity of the economy and identifying leading sectors by comparing them with a wider area such as the Province or National. In general, the purpose of the shift share analysis in this study is to determine the productivity of the leading sectors in the regions and provinces (Aditama, 2019). The next analysis is regarding the shift share and the findings that in 2019 in several regions, especially in the north - south corridor of East Java, the highest GRDP formation was recorded, namely the industrial sector, trade sector, and service sector. This reflects the pattern of potential attraction from an area that has the same characteristics. Thus, the acceleration of development and growth can be accelerated through sector optimization. In accordance with table 3 shows the results of the shift share for the north - south of East Java.

Table 3. Shift Share in North – South Corridor Region in East Java Region, 2019

No	Area	Superior Sector
1	Kediri City	Industry, Trade, Service
2	City of Surabaya	Industry, Trade, Service
3	Malang city	Industry, Trade, Service
4	Malang Regency	Industry, Trade, Agriculture
5	Sidoarjo Regency	Industry, Trade, Service
6	Pasuruan Regency	Industry, Trade, Agriculture
7	Mojokerto Regency	Industry, Trade, Service
8	Gresik Regency	Industry, Trade, Service
9	Tuban Regency	Industry, Trade, Agriculture

Source: Secondary data output after processing 2020 (Arisetyawan, 2020).

Based on the results of the shift share above, it can be concluded that the industrial structure still dominates the north-south corridor of East Java. Economic activities carried out by each region in the north-south corridor as growth centers will have a wide impact (spread effect) and multiple effects (multiple effects) on the surrounding area, or in other words, the area that becomes the center of economic growth will make the surrounding area also

experienced an increase in economic growth. The position of the contribution of the north - south region to East Java Province is 54% compared to other regions (Aditama, 2018).

The explanation above is reinforced by the position of the north-south corridor which has a higher level of economic activity than other parts of East Java. This condition also occurs because the north-south corridor is a corridor with areas that are known to have the most industrial scope in East Java. On the other hand, one of the areas included in the north-south corridor, namely Surabaya, is the capital of East Java Province. This makes the north-south corridor the center of government and economic center of the province (Aditama, 2018). Lu and Tao (2009) show that government protection and government supervision in carrying out industrial economic activities must be carried out properly through fiscal policy.

In the north-south corridor, economic actors prefer uncertainty and consider competition to provide many benefits to many parties. While outside the north-south corridor, economic actors prefer to avoid uncertainty and perceive competition as detrimental to many parties, especially producers. The difference in perception above is based on the experience and forging in which they live. So, when it is connected with the concept of growth poles as an operational planning model, which describes the conditions in which growth in one region will be a triggering factor for growth in other regions by using indicators of sustainable development, it has not been widely used. Industrial agglomeration can significantly boost regional economic growth. The impact of industrial agglomeration on economic growth has a threshold based on industrial growth. When industrial growth is within a high threshold, the effect of industrial agglomeration on economic growth becomes more pronounced. Therefore, a concept that can describe the classification of regions based on the theory of growth poles and sustainable development is very much needed in order to make policies on regional economic planning (Li, 2020).

Regions that have a lot of manufacturing industries will grow their economy faster than regions that have few manufacturing industries. This is because areas that have a manufacturing industry will have more capital accumulation. The development of the industrial sector in the north - south corridor is a top priority in a country's development plan because of the role of the industrial sector as a leading sector in supporting other sectors. Industrial competitiveness is easier to improve if the industry is grouped so that savings occur. Therefore, to increase industrial competitiveness, industrial agglomeration is necessary. The implementation of industrial agglomeration requires the right strategy so that industrial agglomeration can contribute greatly to the regional economy.

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Previous research suggests that the role of industrial agglomeration is able to improve the economy of a region with the addition of a road network, increasing public transportation facilities, changing land use and increasing residential buildings. The development of industrial agglomeration is able to trigger spatial changes in the area affected by the development of the economic sector which is characterized by the presence of new growth centers with the dominance of industrial diversity, trade in services and residential settlements to support industrial operations (Sholihah, et.al, 2018). The success of industrial agglomeration also grows income in an area, as evidenced by the shift in the primary sector (extracting raw materials) which shrinks and shifts to the tertiary sector (business and service providers) and increases the secondary sector (processing raw materials into finished materials (Wahyudi, 2017). One possible explanation is "balance", which implies that different combinations of factors can result in similar levels of firm performance (Kroes, et.al, 2018). Concretely, an increase in inventory performance can be offset by a significant decrease due to negative externalities within the cluster. However, from an inter-regional point of view, confirming that there is a positive relationship between industrial spatial clusters. This positive linkage in the regional economy is able to carry over to most operations management practices within the range of the cluster (Bendig, et.al, 2017 and Chuang, et.al, 2019).

This result is not in accordance with the hypothesis of the New Economic Geography theory which states that agglomerated industries are positively related to economies of scale. This is because industrial companies with small economies are encouraged to agglomerate with the aim of getting economies of localization because they are located close to other industries. Locations that are close together between industries can minimize transportation costs, transaction costs and production so that the resulting output is larger and production efficiency occurs so that initially small-scale industries can enjoy economies of scale (savings due to large-scale production). This in the end can make these industries competitive

CONCLUSION

All areas of the northern and southern corridors still maintain the industrial sector and continue to grow every year. Some areas that enter the north-south corridor, such as the Mojokerto Regency, recorded an increase in the LQ value in the industrial sector with a value of 1.82 (LQ), followed by Pasuruan Regency by 1.95 (LQ), and Sidoarjo Regency 1.69 (LQ). The absorption of labor in several industrial areas in East Java in the north and south corridors is also influenced by the completeness of regional infrastructure. The results of the LQ and

Shift Share analysis show that most of the sectors that form the basis of districts/cities in the north-south corridor area generally excel in the industrial, trade, and service sectors.

The use of LQ and Shift Share analysis must still be carried out carefully analyzing each component of the existing variables (both economic growth, competitiveness, and industry mix variables (proportional shift) for each sector in economic activity. The results of this study are still not fully understood). describes the performance conditions of the sub-sectors that affect regional income and how much economic growth is in the region.The suggestions that can be made are the need for a review related to the results of the production of leading commodities in the region so that the potential of superior commodities is known and accurate development to support regional economic growth.

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