

Regional Specialization and Labor Productivity of Food Industry in South Sumatra

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ABSTRACT

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SMEs became the leading sector contribute to Gross Domestic Product (GDP) in Indonesia. The role of SMEs not only can give positive impact encourage potential development sectors. This paper is to investigate the relationship between the characteristics of regional specialization and labor productivity of small enterprises in the Food industry using the regency or city level data of South Sumatra from 2008-2018. The study used secondary data from the Department of Trade and Industry of South Sumatra for 17 regencies/cities in South Sumatra. Our study proceeds in two steps. First, we used Location Quotient (LQ) to identify the regional specialization. Second, we measured the impact of regional specialization on labor productivity including other regional variables; investment, a total of enterprises, size of employment, Gross Domestic Product Regional (GRDP), and Gross Enrolment Rate based on the panel data of regencies or cities. In the first step, we found that eight regencies specialized in the Food industry. Those typically concentrated near of big city where few enterprises dominate. Next, the LQ, investment, average size of employment, GRDP, and a total of enterprises have a significant effect on labor productivity while the education variable does not influence regional economic growth. According to this result, it should be cautioned that agglomeration may cause undesirable competition for raw materials leading to a detrimental result. This strongly suggests that to fully achieve labor productivity in South Sumatra, there is a need for the implementation of appropriate policy measure to overcome this issue.

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Introduction

SMEs are a strategic and important force in Indonesia's economic development. They are pivotal for reducing poverty and making a significant contribution in improving regional economies and national economic resilience (World Bank, 2005). The role of SMEs for the Indonesian economy is increasing every year. In 2018, SMEs contributed Rp.8,400 trillion

to the Gross Domestic Product (GDP) and successfully absorbed 163 million workers. It means that SMEs contributed 60% of total GDP, Rp14,000 trillion, and 96% of total employment, 170 million workers, in Indonesia (Small Medium Enterprises Association, 2019).

The importance of SMEs in developing countries such as Indonesia is to eliminate inequalities caused by uneven development processes, especially because of the urban development bias that left rural areas far behind of urban areas. Some of the roles are (1) Being major players in economic activity in Indonesia, (2) Job opportunity providers, (3) Important players in local economic development and community development, (4) Market creator and innovation through their flexibility and sensitivity as well as dynamic engagement between company activities, and (5) Contributing to an increase in non-oil exports (Urata, 2000).

South Sumatra is one of the provinces outside Java that has greater opportunities than other regions in increasing the productivity of Small and Medium Industries (SMEs). BPS (2018) noted that 13,327 units of small industries in South Sumatra province. Small industries are spread in all regencies/cities in South Sumatra province with the largest distribution in Palembang City (20.67 percent); Musi Banyuasin Regency (13.12 percent); and Kota Pagaralam (12.55 percent). The region that has a relatively small number of small industries is the Empat Lawang District (0.58 percent). Small industries are not in direct competition with large industries. They are incorporated in the market as suppliers of raw materials and subcontractors of the outsourcing of large industries, and also as producers for niche markets. Consequently, sufficient economies of scale must be created, so those small industries can access a large number of customers (Kuncoro, 2012). Agglomeration of small industries may spread to extended areas, which is even cross-jurisdictional.

Manufacturing in South Sumatra is also known for some unique products. One of the promising products in South Sumatra is Food Industry. In the food industry, a fish cake delicacy called '*pempek*' expands its market beyond the local to national and even international scale. Online pempek orders through PT Pos Palembang from the beginning of December 2013 experienced an increase. Before December 2013, pempek orders averaged 100 kg per month to an average of 2.5-3.5 tons in 2014. Currently online pempek orders reach 8 tons per month both for domestic and foreign destinations, especially ASEAN countries such as Malaysia, Singapore and Thailand. Freshwater fish production including natural catches in South Sumatra, in 2013 as a whole reached 601,950 tons (Department of Fisheries and Maritime Affairs of South Sumatra Province, 2014). The abundant local production of freshwater fish as raw material and the expansion of market areas

increasingly provide opportunities to increase the number of pempek business operators in the City of Palembang, especially micro and small industries.

In the context of spatial economics, the concept of agglomeration is related to the geographical concentration of economic activities. According to Kuncoro (2002), agglomeration is a spatial concentration of economic activity seeking savings of transportation costs related to interactions among companies, workers, and consumers. The notion of economic agglomeration is also related to the externalities of geographical proximity of economic activities, such as the knowledge spill-over. Agglomeration magnifies economies of scale, hence industries tend to agglomerate and serve the entire market from that location. South Sumatra spans 87.4 thousand square kilometers, which corresponds to about one-fourth of Japan and is almost as big as Nigeria or Venezuela. It is positioned in a strategic location with high market potential within short distances to major regional markets with the support of a port that can directly connect to big markets, such as Batam (462 km) and Bangka Belitung (364 km) and even the international markets of Singapore (493 km) and Malaysia (762 km). Moreover, South Sumatra is closer to the government and the market in Jakarta (426 km). Those five markets have a big population with 1.376.009 (Batam), 1.223.296 (Bangka Belitung), 10.476.500 (Jakarta), 5.638.700 (Singapore), Malaysia (32.322.531). South Sumatra has ports to connect directly to Bangka Belitung (Tanjung Api-Api Port), Batam (Musi River/Boom Baru), and Singapore (Musi River/Boom Baru).



(Source: <http://www.worldeasyguides.com>)

Figure 1. Indonesia's Map

Method

This study used panel data of 17 regencies or cities in South Sumatra, Indonesia over eleven years. The data was obtained by the Department of Trade and Industry of South Sumatra Province upon our demand. There are 17 regencies in 2018 after Pali was established in 2012 and separate to be Muara Enim and also Muratara in 2013 from Musi Rawas. To simplify our calculation, the data of these two regencies are rejoined to the former regencies.

In the first step, this study used the number of employees as an indicator of industry size. We use Location Quotient (LQ) as the measure of regional specialization level. LQ is a comparison of the share of an industry i in region r against the share of the same industry in a wider area (Mukhlis 2014), which is calculated by the following formula:

$$LQ_{ir} = \frac{X_{ir}/X_r}{X_i/X} \quad (1)$$

Where X_i denotes employment in region r in industry i , X_r denotes employment in region r in all industries, X_i denotes the total employment in all regions in industry i , and X denotes the total employment in all regions in all industries.

LQ_{ir} is the share of industry's employment in region r relative to the share of the same industry in all regions. Therefore, it expresses that region r is relatively specialized in industry i if $LQ_{ir} > 1$.

The growth of concentration has a positive impact on economic growth until a certain peak. From this peak, a further increase in the concentration could cause losses. In this sense, cities that suffer from over-concentration could be lower in economic growth rates as a result of agglomeration diseconomies, confirming the fact that there is an optimal size of cities that provides the most benefits (Henderson, 2000). In the next step, the study explores our empirical model is given as follows:

$$\ln LP_{rit} = \beta_0 + \beta_1 lq_{rit} + \beta_2 \ln Investment_{rit} + \beta_3 Enterprises_{rit} + \beta_4 aversize_{rit} + \beta_5 \ln GRDP_{rt} + \beta_6 educ_r + u \quad (2)$$

Where $\ln LP$ is natural log form of Labor Productivity, r is regencies in South Sumatra Province, i is industry, t is times (2008 to 2018), Lq is Location Quotient regional r industry I , $\ln Investment$ is natural log form of investment regional r industry I , $Enterprises$ is total of enterprises in regional r industry I , $aversize$ is average size of employment regional r industry I , $\ln GRDP$ is natural log form of Gross Regional Domestic Product regional r , Edu is Gross enrolment Rate regional r , u is error terms.

In this step to measure the signification of each variable, I conduct both fixed-effect model and random effect model estimation, then we will perform a Hausman test to decide which estimation technique we will approve.

Discussion

Location Quotient (LQ)

Regional specialization Food industry using Location Quotient (LQ) in South Sumatra for the 2008-2018 period is shown in Tabel 1 . Pali was established in 2012 separated by Muara Enim and Muratara in 2013 from Musi Rawas, therefore available data was provided in one or two years ahead. Empat Lawang, OKU Selatan, OKU Timur are famous for their regional specialization of the food industry, (2.89, 2.49 and 2.22); The analysis of regional industrial specialization of South Sumatra using LQ shows that: most regencies specialized in food Industry are located in the south-eastern area (OKU Timur, OKU Selatan, Pagar Alam, and Empat Lawang).

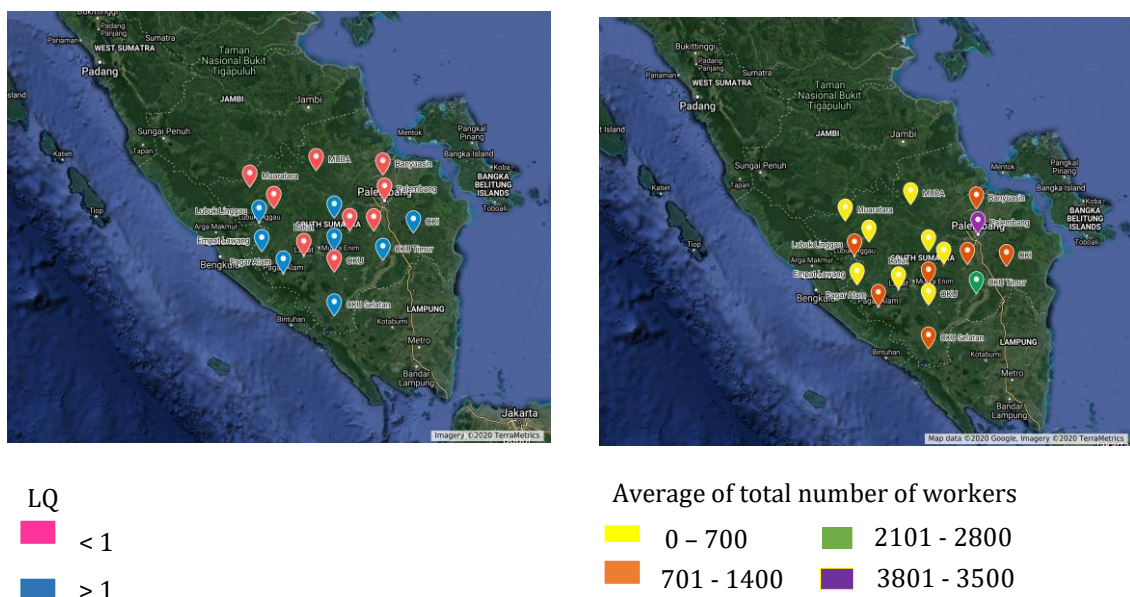
Table 1. LQ Result in Food Industry in South Sumatra 2008-2018

No.	Regencies/ City	LQ (Food industry)											Average of LQ
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
1	Palembang	1.00	0.86	0.86	0.86	0.75	0.80	0.79	0.74	0.69	0.74	0.77	0.81
2	Ogan Ilir	0.88	0.95	0.96	0.95	1.11	0.92	0.91	0.85	0.94	0.83	0.87	0.92
3	OKI	1.47	1.23	1.23	1.22	1.22	1.18	1.16	1.09	0.95	0.93	0.91	1.15
4	Banyuasin	0.61	0.61	0.61	0.61	0.60	0.80	0.58	0.70	0.62	0.78	0.83	0.67
5	MUBA	0.33	0.48	0.49	0.49	0.49	0.47	0.46	0.43	0.83	0.63	0.52	0.51
6	Prabumulih	0.79	1.15	1.12	1.11	1.11	1.00	0.98	0.91	0.99	0.71	0.74	0.96
7	Muara Enim	0.76	1.00	1.05	1.09	0.82	1.35	1.33	1.25	1.20	1.05	1.26	1.10
8	OKU	0.96	0.95	0.89	0.88	0.88	1.02	0.86	0.69	0.80	0.91	0.73	0.87
9	OKU Timur	2.08	2.50	2.51	2.32	2.27	1.83	2.20	2.07	2.12	2.22	2.31	2.22
10	OKU Selatan	2.54	2.54	2.55	2.57	2.17	2.61	2.57	4.06	1.96	1.95	1.89	2.49
11	Lahat	0.79	0.75	0.76	0.87	0.88	0.98	0.87	1.05	0.99	1.09	0.95	0.91
12	Pagar Alam	1.79	1.59	1.60	1.59	1.82	1.70	1.76	1.55	1.60	1.72	1.61	1.67
13	Empat Lawang	2.52	3.66	3.68	3.65	3.13	3.02	2.98	2.86	2.69	1.84	1.78	2.89
14	Musi Rawas	0.74	0.71	0.72	0.71	0.71	0.59	0.58	0.92	0.92	0.81	0.70	0.74
15	Lubuk Linggau	0.89	0.99	1.01	1.00	1.04	1.08	1.07	1.00	0.98	1.02	1.05	1.01
16	PALI	0.00	0.00	0.00	0.00	0.00	0.00	0.52	1.94	1.49	1.35	1.43	1.35
17	Muratara	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.45	0.70	0.58

Source: Calculated by Author

The food industry in Indonesia is traditionally important and contains a very large variety of products, which is especially the case in South Sumatra, such as pempek industry clusters. Typically, the food industry is less advanced in the use of technology and firms highly depend on easy access to raw materials. Firms remain small as their financial resource usually comes from a personal source. Most of these enterprises are usually not interested in a big business in larger markets in urban areas although some enterprises are located in urban areas. Therefore, the industrial structure is highly competitive. Firms

produce similar products. They tend to be located in the same place where there are raw materials available at a cheap price. The Musi River, which is the longest river in South Sumatra, supports the development of small industries in pempek. Yulia and Neny (2019) explain that the 26 ilir area (southern part of South Sumatra) in Palembang is known as the pempek cluster which sold about 1 million pempek on average each month. They also found that 63.6% of buyers bought the product because of the affordable price, and 36.4% said it because of the taste, which corroborates the importance of price in the competition. Table 1 and figure 2 show that regional specialization is seen in the south-eastern area of South Sumatra being adjacent to each other. It is to be noted that the south-eastern regencies are conveniently located to access both Palembang (the capital city of South Sumatra) and cities in Lampung province in the southernmost tip of the Sumatra Island. In addition, Figure 2 also showed the deployment of LQ including the total number of workers in every regency. We can see that agglomeration (showed by LQ) had less than 700 workers.



Source: Author processed

Figure 2. LQ and Workers' deployment in Food Industry in South Sumatra 2008 - 2018

Empirical Result

Some empirical results are based on the panel data regression of the model presented in Table 2. The panel data consists of observations of 17 regencies of South Sumatra during 2008-2018 for the Food industry. The food industry is able to make a significant contribution to the development of the small industry.

Table 2. Regression Result: Food Industry

<i>Variables</i>	<i>Food Industry</i>	
	<i>ln LP</i>	
	<i>FEM</i>	<i>REM</i>
Lq	0.552*** (0.138)	0.558*** (0.130)
Lninvest	0.338*** (0.080)	0.299*** (0.079)
Enterprise	-0.004*** (0.000)	-0.004*** (0.000)
Aversize	-0.215*** (0.038)	-0.169*** (0.034)
Lngrdpr	1.007*** (0.180)	1.215*** (0.132)
educ	0.144 (0.584)	-0.193 (0.511)
Constant	-11.437*** (2.742)	-14.439*** (2.116)
Observations	165	165
Number of regencies	15	15
R-squared	0.583	0.578
Hausman Test	Yes	No

Source: Calculated by Author

By the results of food industry regression analysis, it is known that regional specialization, investment, enterprises, the average size of employment, GRDP, have a significant effect on labor productivity, while the education variable does not influence labor productivity. This implies that regional specialization is based on the natural advantage of lower costs in raw materials, which enables firms to produce more with a given amount of labor. Then, investment, GRDP, and education will increase labor productivity while enterprises and the average of employment will decrease labor productivity. In this industry, we indicate if the food industry as the traditional business has to transport to use technology and it will take more contributions for GRDP. This situation suggests that the firms need to invest in sophisticated technology followed by increasing education for their employees to increase labor productivity and they can survive even in small businesses with few employees.

Significance and limitation of the study

The government of South Sumatra optimizes to fully support the development of small industries to increase production and export. This study will be important in informing this regional policy about the potential benefits and practical supports. The study will also fit into the South Sumatra government's current strategy of Micro, Small, and Medium Enterprises Based on Local Resources that are Independent and Competitive towards Prosperous South Sumatra by the Department of Trade and Small and Medium Enterprises.

The Ministry of National Development Planning of Indonesia noted that South Sumatra is one of the regions that will be developed as a national-scale center of trade, and services, for which development financing plans of investment are formulated. The National development plan in the middle term 2020-2024 also includes the development of rural areas, integrated village development, and the support of disadvantaged areas. This research provides empirical support for this line of idea.

However, this study has a limitation of the lack of data of enterprise-specific information at more detailed location level than a regency. The industrial classification in five groups of our data is too broad and we were not able to capture specific sector-level different characteristics as they are emphasized in the official plan.

Policy implication

There are still more weaknesses in the development of small industries, such as: the weak development of human resources in the regency/city; the limited infrastructure in supporting trade at a national and international scale; and the difficulty of access to get capital. These problems must be addressed for the sustainability of small industries in South Sumatra:

1. In enhancing the capacity of knowledge, some job-oriented pieces of training are needed. Although a basic education can increase labor productivity, it is almost not significant in the real world. The regional government must pay more attention to foster professional knowledge. In an effort to encourage this growth, the provincial government of South Sumatra has facilitated new business actors and existing SMEs to expand their business by holding socialization and training seminars in various district/city areas. Business actors can also get training provided by the Cooperative Education and Training Agency (UPTD Balatkop) in regencies/cities in South Sumatra.
2. Collaboration between government and private e-commerce services must be continued and develop a shared vision to make small businesses in South Sumatra able to participate in the era of Digital Energy of Asia in 2020. The food industry can be a potential industry to expand in the national and international market through digital marketing. Concentrating in Palembang as the capital city and the most visited tourist, it is supported by transportation access, market, and number of enterprises.
3. There are six industrial zones in South Sumatra, namely Muara Enim Regency, Penukal Abab Lematang Ilir (Pali), Lubuklinggau City, Banyuasin Regency, Ogan Komering Ilir (OKI) and Palembang City. With three toll roads at the same time, one is directly connected to the Tanjung Api-Api Special Economic Zone and the Gandus Industrial

Estate. Global cross-sea trade continues to increase as a major supporting factor in trade globally, it must be anticipated by improving more efficient port management and increasing port capacity to increase production. Ports in South Sumatra must be developed to be able to serve the national movement and international.

4. Entrepreneur Student Movement Program. This program facilitates students who have an interest in starting a business with his/her knowledge base, technology and art. One of a program created by Ministry of Cooperative and SMEs. Some of the universities in Palembang such as the University of Sriwijaya, the University of Muhamadiyah Palembang and the University of Indo Global. In University of Muhamadiyah Palembang, joined this program, to reduce obesity issues, students were supported financially to build food enterprises of balanced nutrition product that opened in canteen at their university

Conclusion

The objective of this study was two-fold. First, we aimed at identifying some patterns of geographical distribution of industrial activities in South Sumatra. Second, we investigated how the regional characteristics, including those describing regional specialization characteristics, influence the labor productivity of small enterprises. The results revealed that Palembang as the central area in South Sumatra still dominates in the number of business units and employment except for the number of business units in the food industry. The food industry is atypical among five industry groups. It is only in the food industry that the degree of specialization (LQ) has a significant and positive association with labor productivity. This result implies that the specialization in the food industry is based on a natural advantage (i.e, availability of raw materials at a cheaper cost), which also enhances labor productivity. We also found that regional specialization expressed as the number of enterprises has a negative correlation with labor productivity. This association is also pointed out in a previous study (Mukhlis, 2014). We can infer that because of the importance of access to locally produced raw materials, regional specialization will intensify the competition for them. Otherwise, investment and enterprises have a negative sign in two, major industries because they can survive in small businesses even do not need to transform to be big firms although it can be sufficient to increase gross regional domestic product. In addition, Although, education can increase labor productivity it is almost insignificant in all major industry

In sum, the food industry in South Sumatra will be promising by enhancing local specialization by small enterprises. It should be cautioned that too much regional

specialization may cause undesirable competition for raw materials leading to a detrimental result.

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