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IDENTIFICATION AND MAPPING OF POTENTIAL PROCESSING INDUSTRY TYPES WITH LOCATION QUOTIENT (LQ) IN BOYOLALI DISTRICT

Silfina Dwi Oktaviani[1], Katon Muhammad[1*], and Maria Krisnawati[1]

[a] Department of Industrial Engineering, Universitas Jenderal Soedirman

Jl. Mayjen Sungkono KM 05 Blater, Kalimanah, Purbalingga 53371, Indonesia

*E-mail: katon.muhammad@gmail.com

Abstract

In the current era of regional autonomy, regional economic development should be conducted sustainably across all fields, sectors, and sub-sectors in a programmed manner. Sustainable regional economic development is influenced by comparative advantages, regional specialization, and the economic potential of a particular area. The primary objective of regional economic development is to enhance the well-being of the community through an increase in the quantity and variety of job opportunities. Empowering Small and Medium Enterprises (SMEs) is one way to boost employment opportunities, involving a significant workforce and identifying competitive sectors in the region to enhance regional economic development. Boyolali Regency has shown relatively good growth in SMEs; however, there is a lack of mapping for basic sectors within these SMEs. This absence may lead to suboptimal utilization of available labor and production outcomes. Therefore, this research aims to identify and map SMEs with the potential to absorb more labor in Boyolali Regency. The Location Quotient (LQ) method is utilized to identify basic and non-basic types of SMEs using labor data from SMEs in Boyolali Regency. LQ calculations demonstrate that each SME has various basic sectors. This analysis produces mapping data of basic SMEs that can be used as a reference for more targeted development in SMEs, leading to increased job absorption.

Keywords: basic, employment, location quotient, SME

1. Introduction

In the era of regional autonomy, where the gap between developed and developing regions widens due to the advancement of globalization, there is an increasingly fierce competition, and regional development becomes more complex [1]. According [2], achieving development requires a sustainable and well-programmed approach across all fields, sectors, and sub-sectors. Sustainable regional economic development is fundamentally influenced by comparative advantages, regional specialization, and the economic potential of a particular area [3]. The main objective of regional economic development is to enhance the welfare of the community by increasing the quantity and diversity of job opportunities [4]. In line with that, it is explained in Law No. 20 of 2008 concerning Small and Medium Enterprises (SMEs) that SMEs play a crucial role in the Indonesian economy. The business activities of SMEs serve to create job opportunities, and with their crucial position in economic science, they can help increase income [10]. In Boyolali Regency, the development of the number of SMEs is relatively good, as seen in the presence of small and medium-sized industries up to several large industries in the region. According to the Regional Medium-Term Development Plan (RPJMD) 2021-2026, Boyolali Regency has a mission to increase the production value of Small and Medium Enterprises (SMEs) to enhance the capacity of Human Resources (HR) involved in SMEs. The Department of Trade and Industry of Boyolali Regency states that from 2019 to 2022, Boyolali Regency has 6507 SME units with the potential for development. This reflects Boyolali Regency's commitment to supporting the growth and development of the SME sector as part of the local economic development strategy. With a significant number of SME units, the potential for contributing to economic growth and improving the welfare of the local community can become a reality. Because MSMEs are strongly related to the economic development of a region [11].

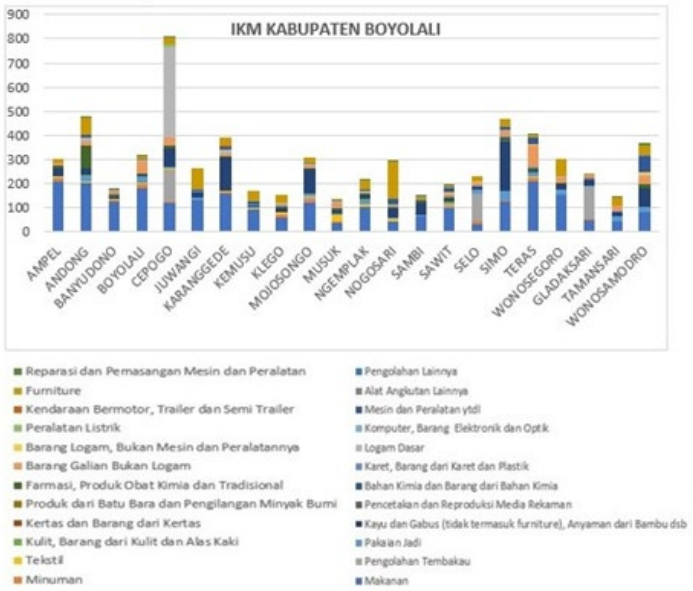

Figure 1. Boyolali Regency SMEs

In Kabupaten Boyolali, there is a lack of mapping for the basic sectors within SMEs. This deficiency can lead to the suboptimal utilization of available workforce and production outcomes [5]. The Regional Medium-Term Development Plan (RPJMD) 2021-2026 also emphasizes that the employment conditions in Kabupaten Boyolali are still not optimal, particularly in terms of labor absorption. Therefore, it is necessary to map the leading sectors to determine the area's superior potential. One approach is to use the Location Quotient (LQ). Location Quotient (LQ) is used to analyze a concentration of industry/economic sectors. This method is used in empirically based research. Economic activities are the basis for having a competitive advantage for development in driving the regional development process. Meanwhile, the non-base sector has a role as a support for the base sector [12]. A sector or economic activity classified as basic means that it has a competitive advantage that must be developed to encourage the development process in the region, while a sector or economic activity classified as non-based acts as a supporting sector for the basic sector [13].

The combination of basic sectors and non-based sectors is a crucial element in encouraging economic growth in a region [14] [15]. Therefore, an appropriate method for mapping is the use of the Location Quotient (LQ) method, as it can identify the basic sectors in a specific region, enabling mapping according to their potential. Consequently, the focus of this research will be on determining and utilizing a map of the location of basic SME sectors in Kabupaten Boyolali to optimize industrial growth. The anticipated outcome of this research is to provide insights to the local authorities in Kabupaten Boyolali, aiding them in improving workforce absorption.

2. Material and Methods

The research begins with problem formulation, where the researcher identifies the issues with the assistance of literature studies as a foundation and support for the research. Subsequently, the researcher sets the research objectives to be achieved as the ultimate outcome of the study.

2.1 Data collection

This research utilized data from Micro, Small, and Medium Enterprises (SMEs) in Boyolali Regency for the years 2019-2022, including the number of their workforce. The data used in this study were secondary data obtained from the Boyolali Regency Office of Industry and Trade. The Location Quotient (LQ) method was employed to identify the types of SMEs as either base or non-base industries with the following formula [6].

$$LQ = \frac{L_i/L_t}{N_i/N_t} \quad (1)$$

Where,

Li = the number of labor in sector i at a lower geographical level

Lt = the total labor at a lower geographical level

Ni = the number of labor in sector i at a higher geographical level

Nt = the total labor at a higher geographical level

2.2 Data Processing

This stage consists of several stages of data processing which will be developed as further improvement steps.

a. Data Compilation

The initial step in data processing for this research is to compile all the manufacturing industry efforts within the Small and Medium Enterprises (SMEs) in Boyolali Regency. Once all types of businesses are identified, they are then classified according to the industry sector categories based on the Standard Indonesian Field of Activities (KBLI) 2020 classification. Subsequently, data on the number of labor according to sub-district and their types are compiled.

b. Data Calculation

Once the data is properly compiled, data processing is carried out using the Location Quotient (LQ) method, comparing the types of businesses in the Small and Medium Enterprises (SMEs) of Boyolali Sub-Districts with a labor approach to determine the base and non-base SME sector types for each sub-district. The location quotient (LQ) can be used to analyze and create location clusters to identify the leading economic sectors in that regional location [8]. Location quotation (LQ) analysis can also compare the role of a sector/industry in the region to the role of a sector/industry in the province [9].

c. Ranking of LQ Values

Ranking is conducted to facilitate the government in exploring or prioritizing SMEs with the potential for further development and non-base SMEs that may require intervention. Additionally, this process allows for the assessment of competitive/comparative advantages that not only stimulate economic sectors but also enhance employment opportunities within each sub-district.

d. Mapping

Mapping will be conducted using Excel with the additional feature of Power BI, which is used to showcase the leading sectors in all districts in Boyolali Regency. The visual map will depict the distribution of SME types based on each district.

3. Results and Discussion

This section contains the results and discussion of the data collection and processing stages that have been processed based on research methods.

3.1 Data collection from LQ

The determination of basic and non-basic SMEs is crucial for directing the development potential of each district in Boyolali Regency in the future. The types of SMEs analyzed focus on the processing industry category in accordance with the Standard Indonesian Business Field Classification (KBLI) regulated by the government in 2020. Based on the type of processing industry, the most significant number of SMEs and job absorptions are in the food industry. There are even no SMEs for the coal and petroleum refining products, motor vehicles, trailers and semi-trailers, other processing,

computers, electronic, and optical goods industries. To identify the basic and non-basic SME types in the processing industry sector, Equation 1 is applied with values based on the number of workers. This is intended to determine the types of SMEs that have competitive/comparative advantages that not only promote the economic sector but also increase job opportunities in each district in Boyolali Regency. Table 1 below is a summary of SME types in the processing industry sector with the highest Location Quotient (LQ) values (LQ > 1) for each district in Boyolali Regency. These SME types are considered basic sectors with comparative advantages.

Table 1. Basic SME types for each district

District	No	Type of SME	LQ
Ampel	1	Rubber, rubber and plastic goods	5,08516
	2	Wood, wooden and cork products and woven bamboo, rattan, and similar items	3,37075
	3	Food	1,181201
Andong	1	Pharmaceuticals, chemical and traditional medicine products	7,52269
	2	Ready-made clothing	2,84991
	3	Furniture	1,49856
	4	Food	1,20896
Banyudono	1	Chemicals and chemical products	2,59714
	2	Rubber, rubber and plastic goods	2,52314
	3	Food	2,33915
	4	Leather, leather goods, and footwear	2,30032
	5	Pharmaceuticals, chemical and traditional medicine products	1,33483
	6	Textiles	1,25683
	7	Beverages	1,25642
Boyolali	1	Beverages	6,55965
	2	Chemicals and chemical products	5,33106
	3	Other transportation equipment	5,25756
	4	Non-metallic mineral products	2,42363
	5	Ready-made clothing	1,97723
	6	Machinery and equipment installation and repair services	1,89088
	7	Food	1,34324
Cepogo	1	Electrical equipment	6,04408
	2	Basic metals	5,65835
	3	Tobacco processing	2,12396
Juwangi	1	Furniture	3,92395
	2	Leather, leather goods, and footwear	3,82876
	3	Food	1,52829
Karanggede	1	Wood, wooden and cork products and woven bamboo, rattan, and similar items	2,09834
	2	Food	1,41271
	3	Machinery and equipment n.e.c.	1,34102
	4	Furniture	1,03725
Kemusu	1	Textiles	3,38302
	2	Furniture	3,28524
	3	Food	1,62116
	4	Other transportation equipment	1,61584
	5	Machinery and equipment n.e.c.	1,26959
Klego	1	Textiles	3,26801
	2	Beverages	2,46835
	3	Furniture	2,07546
	4	Chemicals and chemical products	1,70077
	5	Food	1,31211
	6	Pharmaceuticals, chemical and traditional medicine products	1,20768
	7	Rubber, rubber and plastic goods	1,12658
	8	Non-metallic mineral products	1,10423

District	No	Type of SME	LQ
Mojosongo	1	Leather, leather goods, and footwear	7,01801
	2	Wood, wooden and cork products and woven bamboo, rattan, and similar items	3,12559
	3	Other transportation equipment	2,99552
	4	Beverages	1,64829
	5	Food	1,11348
	6	Textiles	1,01501
Musuk	1	Chemicals and chemical products	11,6956
	2	Textiles	4,84712
	3	Other transportation equipment	3,90133
	4	Non-metallic mineral products	3,52634
	5	Leather, leather goods, and footwear	3,04676
	6	Beverages	2,79572
	7	Ready-made clothing	1,78976
	8	Pharmaceuticals, chemical and traditional medicine products	1,39577
Ngemplak	1	Machinery and equipment installation and repair services	3,22196
	2	Leather, leather goods, and footwear	3,22196
	3	Furniture	3,19303
	4	Textiles	2,56292
	5	Ready-made clothing	1,71662
	6	Machinery and equipment n.e.c.	1,25858
	7	Food	1,20211
Nogosari	1	Paper and paper products	19,5652
	2	Printing and reproduction of recorded media	6,09927
	3	Machinery and equipment installation and repair services	3,96057
	4	Furniture	3,09650
	5	Textiles	2,90223
	6	Machinery and equipment n.e.c.	2,44565
	7	Ready-made clothing	2,02313
	8	Rubber, rubber and plastic goods	1,98096
	9	Beverages	1,06534
Sambi	1	Chemicals and chemical products	2,19803
	2	Rubber, rubber and plastic goods	1,94128
	3	Ready-made clothing	1,80853
	4	Wood, wooden and cork products and woven bamboo, rattan, and similar items	1,60894
	5	Food	1,53817
Sawit	1	Textiles	8,12046
	2	Metal goods, excluding machinery and equipment	7,91581
	3	Leather, leather goods, and footwear	6,27176
	4	Machinery and equipment n.e.c.	4,81582
	5	Other transportation equipment	3,82424
	6	Chemicals and chemical products	2,83241
	7	Machinery and equipment installation and repair services	1,65046
	8	Food	1,16999
Selo	1	Tobacco processing	6,12266
	2	Metal goods, excluding machinery and equipment	2,59558
	3	Machinery and equipment installation and repair services	1,38195
	4	Chemicals and chemical products	1,07800
Simo	1	Printing and reproduction of recorded media	7,50672
	2	Metal goods, excluding machinery and equipment	5,90820
	3	Rubber, rubber and plastic goods	4,31708
	4	Wood, wooden and cork products and woven bamboo, rattan, and similar items	2,36496
	5	Ready-made clothing	2,30105
	6	Machinery and equipment n.e.c.	1,08669
Teras	1	Non-metallic mineral products	4,28475

District	No	Type of SME	LQ
	2	Machinery and equipment n.e.c.	2,84615
	3	Beverages	2,1443
	4	Ready-made clothing	1,43749
	5	Food	1,35603
	6	Metal goods, excluding machinery and equipment	1,05164
	7	Machinery and equipment installation and repair services	1,04712
	8	Textiles	1,02309
Wonosegoro	1	Furniture	2,45567
	2	Food	1,73156
Gladaksari	1	Printing and reproduction of recorded media	6,26004
	2	Tobacco processing	5,81425
	3	Other transportation equipment	1,16039
Tamansari	1	Non-metallic mineral products	4,11491
	2	Metal goods, excluding machinery and equipment	2,78793
	3	Furniture	1,58650
	4	Wood, wooden and cork products and woven bamboo, rattan, and similar items	1,44087
	5	Ready-made clothing	1,12083
	6	Machinery and equipment installation and repair services	1,07953
	7	Beverages	1,07549
Wonosamodro	1	Machinery and equipment n.e.c.	6,98589
	2	Other transportation equipment	6,27744
	3	Metal goods, excluding machinery and equipment	3,49830
	4	Machinery and equipment installation and repair services	3,28975
	5	Wood, wooden and cork products and woven bamboo, rattan, and similar items	1,73204
	6	Ready-made clothing	1,72789
	7	Furniture	1,37930
	8	Pharmaceuticals, chemical and traditional medicine products	1,34751
	9	Non-metallic mineral products	1,08942

Based on Table 1, there is a variety of basic SME types in each district. Nogosari and Wonosamodro have the most diverse range with 9 basic SME types, followed by Klego, Sawit, Teras, and Musuk with 8 basic SME types, Banyudono, Boyolali, Ngemplak, Tamansari , and Simo with 7 basic SME types, and other districts have fewer than 7 basic SME types, with the lowest variation being in Wonsegoro with only 2 types. Comparing the largest LQ values between districts, the highest LQ value is for "Kertas dan barang dari kertas" (Paper and paper products) with an LQ of 19.56 in the Nogosari district.

Mapping is only performed on basic processing industry types because they represent non-basic processing industry types as well. This means that processing industry types not present on the map are considered non-basic. The visualization of processing industry types in each district is depicted with circles of different colors, as explained in the legend. Inside these circles, there is a number that indicates the ranking or order of that processing industry type in the district compared to other districts.

3.2 Recomendation

Based on the analysis results, the development of basic sectors needs to be further enhanced as an effort to boost economic growth while not neglecting non-basic sectors. Priority should be given to the development of basic sectors to ensure a high impact on increasing income and job opportunities for the community. Furthermore, the development of non-basic sectors should be intensified by optimizing available resources and promoting the region's brand image to attract investors and establish partnerships and collaborations with private or other entities. Additionally, the governing authority responsible for formulating SME development strategies is encouraged to conduct a more in-depth assessment

of the current conditions of SMEs in the districts before crafting an effective empowerment strategy. This approach ensures that the strategy is well-directed and targeted.

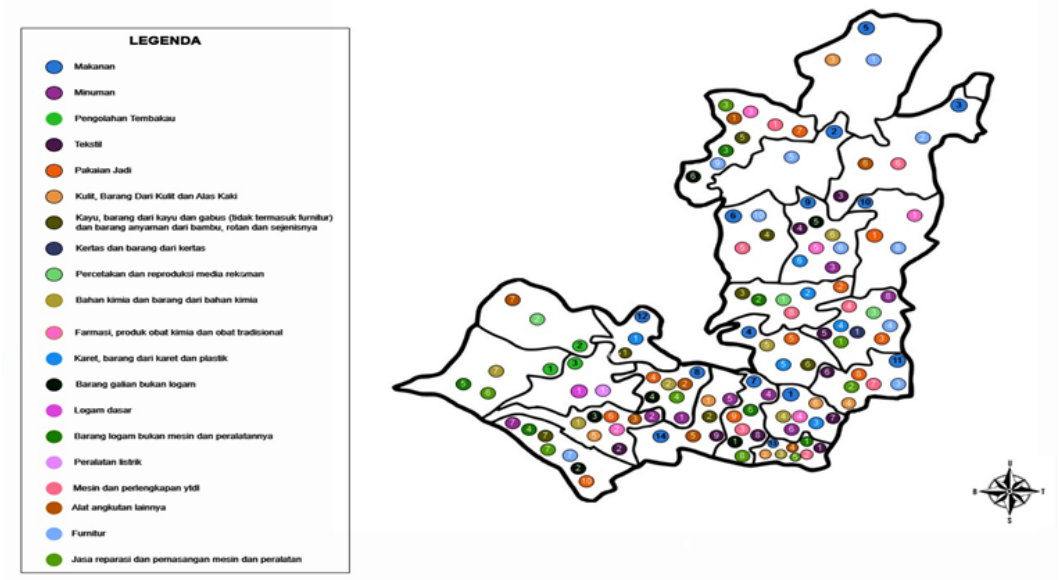

Figure 2. The map distribution of basic SME types in the manufacturing sector

4. Conclusion

Based on the research results involving LQ calculations and basic sector mapping, it can be concluded that the LQ calculations for each type of manufacturing industry in SMEs in each district show that the districts with the highest to lowest number of basic manufacturing industries are, respectively food; furniture; ready-made clothing; textiles; beverages; machinery and equipment (excluding transport equipment); repair and installation services for machinery and equipment; wood and products of wood and cork (excluding furniture) and articles of bamboo, rattan, and similar materials; chemicals and chemical products; other transport equipment; leather, leather goods, and footwear; rubber and plastic products; non-metallic mineral products; metal products (excluding machinery and equipment); pharmaceuticals, chemical products, and traditional medicine; printing and reproduction of recorded media; tobacco processing; rubber, rubber products, and plastic products; basic metals; and electrical equipment.

Then, based on the LQ calculation results, mapping of the SMEs basic sectors is obtained using visual maps, namely the distribution map of basic processing industries and the ranking map of the distribution of basic processing industries. This mapping can be used as a reference for the formulation of empowerment strategies for SMEs, ensuring a more focused distribution of processing industries.

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