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## Analysis of Competitiveness: The Study of Exporting Industries in Central Java Province, Indonesia

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**Abstract:** This research analyses the competitiveness of the export-oriented commodities in Central Java Province, Indonesia. The analysis is conducted on the manufacturing industries, other than textile, textile products and wood processing—the main exporting industries which are known to experience surfeited in last several years; and it is performed in several stages as follows: first, the identification of leading industries by employing the Static Location Quotient (SLQ); second, the mapping of leading export industries using a shift share analysis; third, the measurement of the competitiveness of the export industries in the ASEAN market by using Revealed Competitive Advantage (RCA); and fourth, the mapping out the strategies to improve the competitiveness of exports leading industry by utilizing the SWOT analysis. The research finds that the leading export industries are Beverage, Food, Tobaccos Manufacturing, Oil, The printing and reproduction of recorded media, The plastics and plastic products, The papers and paper products, and The other processing industries. The RCA indexes of these industries exceed 1, which indicate the competitiveness. Based on the leading export industries mapping, the strategies are to expand the market of exports, to increase the quality and quantity of export products, to improve the skill of labour, or to enhance the technological capabilities; and to produce the appropriate policies to increase the industries' export.

**Keywords:** Competitiveness, leading industry, manufacturing industry strategy.

### 1. INTRODUCTION

The higher global competition requires the economic actors in all countries in the world to respond the more dynamic development of the business environment. The rank of competitiveness of Indonesia in 2016-2017 is 41, decreases four points from 37 in previous year (The Global Competitiveness Report 2015-2016, 2016). Although Indonesia has performed a lot of industrial reforms, but the rate of the

economic globalization and technological development make the market more competitive, the product life cycle become shorten to reduce the profit margins, prompted the rank down, so the Indonesian economic actors face heavier challenges in the market.

According to Porter (1990); Moon, Rugman, and Verbeke (1998); Cho and Moon (2003); an industry will be successful and competitive if it has a clear vision, dynamic, and matching with the factor conditions, the demand conditions, the corporate strategy and the competitiveness, and the supporting industries. According to that, the agents of economy in each local region in Indonesia need to know the position of its regional competitive level, especially the competitiveness of the manufacturing sector. For the regional economy, the manufacturing industry development must be able to provide a significant contribution to the economic, socio-political, and cultural developments. The development of manufacturing industries is more intended to handle problems such as: high rate of unemployment and poverty, low economic growth, slowing export growth, poor infrastructure, and lack of mastery of technology.

Central Java is one of the provinces in Indonesia that has the positive growth of the output of manufacturing industry, from year to year. The annually growth of the manufacturing's output is 5.24% (2011-2015), and it dominates 35.17% of the Gross Domestic Regional Product (GDRP) of Central Java. However, the manufacturing is only supported by a few exports commodities during 2011-2015, among others Textiles and Textile Articles (contributes 40% of the total exports); Wood and Wood Articles (contributes 20% of the total exports); and Various Manufactured Articles (contributes 13% of the total exports).

The large potential manufacturing industries which can be seen from the contribution towards GDRP, do not necessarily become the leading commodity for the exports, so this study aims to identify and analysis the potential export commodity other than the special manufacturing industries i.e. Textiles and Textile Articles and the industries of Wood and Wood Articles in Central Java Province.

## **2. LITERATURE REVIEW: MANUFACTURING INDUSTRY COMPETITIVENESS**

Liberalization of the international trade has an impact on the tighter competition in the manufacturing industries, and its requires high competitiveness. The competitiveness should be supported by the strong structure, the high added-value and productivity improvement throughout the chain of production value, and also by its productive resources. The continious increase in manufacturing industry competitiveness configurates the strong economic foundation in the form of macroeconomic stability also the healthy business climate and investment (Momaya and Ajitabh, 2002).

Porter, Ketels, and Delgado (2008) states that competitiveness is how the share of a country's commodities in the world market. The issue of manufacturing industries competitiveness is always associated with a competitive strategy oriented to the low price and product superiority. The competitiveness is the ability of an industry to gain a competitive advantage by relying on the factor conditions; the demand conditions; the corporate strategy and structure of the competition; and also the supporting and related industries. To know which industry is able to compete in an increasingly competitive market, it requires to measure the competitiveness of the product of the industry (Porter, 1990).

Several studies on the industrial competitiveness that refers to Porter are performed by Rugman and D'Cruz<sup>1</sup> (1993); Moon, Rugman, and Verbeke (1998); Betts and Ofori (1994). These studies states that in

order to understand the competitive advantages of a region in the international trade, it should be started by how to make the competitiveness of the individual industries or groups of industries by applying the principle of competitive advantage. Although each individual industry has the ability of competitiveness, the aspect of the government role is very large in encouraging the industry competitiveness. Porter's model of competitiveness considers that a country's competitiveness as a function of the four determinants, those are the factor conditions, the demand conditions, the related and supporting industries, and the firm strategy, structure, and rivalry.

### 3. RESEARCH METHODOLOGY

The data of manufacturing export are based in the two digits International Standard Industrial Classification (ISIC) of Indonesia 2015, and do not include the leading traditional export commodities of Central Java such as Textiles and Textile Articles and the industries of Wood and Wood Articles. The first stage of the research is to map the leading commodities based on the Static Location Quotient (SLQ) and Dynamic Location Quotient (DLQ). SLQ value can be measured by using the following formula:

$$SLQ = \frac{Y_{ij} / Y_j}{Y_{iw} / Y_w} \quad (1)$$

where  $Y_{ij}$  is the output value of a manufacturing industry  $i$  in Central Java Province;  $Y_j$  is the total value of industrial output in Central Java Province;  $Y_{iw}$  is the output value of a manufacturing industry of industry  $i$  in Indonesia; and  $Y_w$  is the total value of output manufacturing industry in Indonesia. If the value of SLQ is  $> 1$ , the industry has a comparative advantage. If the value of SLQ is  $< 1$ , the industry has no comparative advantage. SLQ has the disadvantage, in which the analysis result is static that only provides a description at one point in time, which means that the leading sector this year is not necessarily going to be the leading sector in the future, and vice versa. The weakness of SLQ analysis can be overcome if the growth rate of a sector can be compared to the growth rate of the sector at the national level that is the method of Dynamic Location Quotient (DLQ). According to Kuncoro (2012), DLQ is a modification of SLQ by accommodating the growth factor of the subsector from time to time. DLQ is calculated using the following formula:

$$DLQ_{ij} = \left[ \frac{(1 + g_{ij}) / (1 + g_j)}{(1 + G_{iw}) / (1 + G_w)} \right]^t = \frac{IPPI_{ij}}{IPPI_{iw}} \quad (2)$$

$$g(G) = \left( \frac{Y_t}{Y_0} \right)^{\frac{1}{t}} - 1 \quad (3)$$

where  $DLQ_{ij}$  is the potential index of industry  $i$  in Central Java Province;  $g_{ij}$  is the growth of the output value of manufacturing industry  $i$  in Central Java Province;  $g_j$  is the average growth of the output value of the entire manufacturing industry in Central Java Province.  $G_{iw}$  is the growth of the output value of

manufacturing industry  $i$  in Indonesia;  $Gw$  is the average growth of the output value of the entire manufacturing industries in Indonesia;  $t$  is the difference in the last year, 2015, and the initial year, 2010.  $Y_t$  is the output value in 2015;  $Y_0$  is the output value in 2010;  $IPPI_{ij}$  is the index of the development potential of industry  $i$  in Central Java Province;  $IPPI_{iw}$  is the index of the development potential of industry  $i$  in Indonesia. If the value of  $DLQ$  is  $> 1$ , the development potency of industry  $i$  in Central Java Province will be faster than the same industry in Indonesia. However, if  $DLQ$  is  $< 1$ , the development potency of industry  $i$  in Central Java Province will be lower than in Indonesia. The identification of leading industry is conducted by combining the value of  $SLQ$  and  $DLQ$  to determine whether the industry is classified as leading, prospective, superior, or lagging.

**Table 1**  
**Mixed Analysis Matrix of SLQ and DLQ**

<i>Static LQ/Dynamic LQ</i>	<i>Static LQ &gt; 1</i>	<i>Static LQ &lt; 1</i>
Dynamic LQ > 1	Leading Industry	Superior Industry
Dynamic LQ < 1	Prospective Industry	Lagging Industry

Source: Kuncoro (2012:136).

The results of the leading industry are mapped and then the level of competitiveness is analysed by using the method of Revealed Comparative Advantage (RCA). RCA value can be measured using the following formula:

$$RCA = \frac{X_{ij} / X_{iw}}{X_j / X_w} \quad (4)$$

$X_{ij}$  is the export value of industry  $i$  of country  $j$ ;  $X_j$  is the total export value of country  $j$ ;  $X_{iw}$  is the export value of industry  $i$  of the world; and  $X_w$  is the total export value of the world. RCA value is ranging from 0 to infinity. If RCA is  $> 1$ , the commodity has competitiveness. If RCA is  $< 1$ , it has no competitiveness. The higher the value of RCA is, the more powerful it will be. RCA index is the ratio between RCA in year ( $t$ ) compared with RCA in year ( $t - 1$ ). If the RCA index is  $> 1$ , the competitiveness is increasing. If the RCA index is  $< 1$ , the competitiveness is declining. At the final part of this study, the strategies of commodity development of export leading industry will be recommended by using the SWOT approach.

#### 4. RESULTS AND DISCUSSION

The exports of Central Java Province has been dominated by the manufacturing commodity export, then it is followed by the commodity of agriculture, oil products, mining, raw oil, and others. The share of the manufacturing sector to the total exports of Central Java along 2011-2015 reached 90.5% per year.

The results of estimations identified six leading industries, those are the beverage, the tobacco manufacturing, the pharmacy, the products of chemical and traditional medicines, the printing and reproduction of recorded media, the paper and paper articles, and other manufacturing industries. The map of leading, superior, prospective, and lagging commodities in Central Java in 2011-2015 is summarized in Table 3 as follows:

**Table 2**  
**Profile of Central Java Export, based on the Commodity Groups 2011-2015**

<i>Commodity Groups</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>Average</i> <i>(Million US\$)</i>	<i>Share</i> <i>(%)</i>
Agriculture	169.95	190.06	153.69	162.10	152.02	160.35	3.26
Industry	4,030.91	4,276.34	4,659.39	5,127.57	5,108.86	4,456.30	90.51
Oil Products	398.33	133.18	454.68	336.47	113.04	271.71	5.52
Mining	58.39	45.21	57.71	6.24	0.30	28.65	0.58
Others	0.34	1.42	1.07	1.29	0.48	0.93	0.02
Total	4,691.52	4,646.20	5,326.55	5,633.66	5,374.70	4,923.54	100.00

Source: Central Bureau of Statistics, <http://jateng.bps.go.id>

**Table 3**  
**Map of export commodity of non-oil and gas of Central Java 2011-2015**

<i>Static LQ/Dynamic LQ</i>	<i>Static LQ &gt; 1</i>	<i>Static LQ &lt; 1</i>
<i>Dynamic LQ &gt; 1</i>	<p><i>Leading Industries:</i></p> <ul style="list-style-type: none"> <li>(a) Beverage Industry (11)</li> <li>(b) Industry of Tobacco Manufacturing (12)</li> <li>(c) Industry of Pharmacy, Products of Chemical and Traditional Medicine (21)</li> <li>(d) Industry of Printing and Reproduction of Recorded Media (18)</li> <li>(e) Industry of Paper and Paper Articles (17)</li> <li>(f) Other manufacturing industries (32)</li> </ul>	<p><i>Superior Industries:</i></p> <ul style="list-style-type: none"> <li>(a) Industry of Leather, Leather Articles, and footwear (15)</li> <li>(b) Industry of Non Metallic Minerals Articles (23)</li> <li>(c) Industry of Metal Articles, Not Machines and Fittings (25)</li> <li>(d) Industry of Computer, Electronics, and Optics (26)</li> <li>(e) Industry of vehicles (29)</li> <li>(f) Industry of Rubber, Rubber and Plastic Articles (22)</li> </ul>
<i>Dynamic LQ &lt; 1</i>	<p><i>Prospective Industries</i></p> <ul style="list-style-type: none"> <li>(a) Food Industry (10)</li> <li>(b) Industry of Chemical and Chemical Material Articles (20)</li> <li>(c) Industry of Machine and Equipment (28)</li> </ul>	<p><i>Lagging Industries</i></p> <ul style="list-style-type: none"> <li>(a) Industry of Coal and Petroleum (19)</li> <li>(b) Industry of Primary metals (24),</li> <li>(c) Industry of Electrical Equipment (27),</li> <li>(d) Repair and Installation of Machinery (33)</li> <li>(e) Other Transportations (30)</li> </ul>

The identified leading commodities is then analyzed on its level of competitiveness using RCA index, which are compared with the south east Asian countries region market, which incorporated Association of South East Asian Nation (ASEAN). The RCA index for the five leading commodities are >1, which means that the commodities has comparative advantage in the ASEAN market, with a large market share. It is also known by the Balassa RCA index (> 4) for the export leading manufacturing commodity that has a strong comparative advantage classification (Hinloopen, 2001).

**Table 4**  
**Revealed Comparative Advantage (RCA) of several leading commodities**

Code KBLI	Explanations	Revealed Comparative Advantage (RCA)					
		2011	2012	2013	2014	2015	Average
11	Beverage Industry	2.453	3.537	4.221	5.159	4.709	4.016
12	Industry of Tobacco Processing	0.037	0.034	0.048	0.086	0.081	0.057
16	Industry of Paper and Goods made of Paper	9.806	10.238	11.253	15.668	14.398	12.273
18	Industry of Printing and Reproduction of Recorded Media	8.072	7.326	11.562	14.931	10.232	10.425
21	Industry of Pharmacy, Products of Chemical and Traditional Medicines	8.72	15.926	13.652	13.321	16.332	13.590
32 <sup>*)</sup>	Other Manufacturing Industries						

<sup>\*)</sup> data is not available.

In order to improve the performance of the leading manufacturing commodity exports and to accelerate the export mainstay and prospective industry groups, some policy strategies are taken by the local government. The policy strategies include the followings:

**Table 5**  
**Four Groups of Policies Strategy**

1. Strengths and Opportunities (S-O) strategies are:
  - (1) facilitating the implementation of standardized testing in the laboratory to meet the international standard;
  - (2) improving the integrated service that accelerating the new industry that will enter the export market;
  - (3) encouraging and assisting the industry to meet the standardized licensing;
  - (4) using the ASEAN Single Window facility and the National Single Window to facilitate the maintenance process and the licensing of customs and expenditures;
  - (5) promoting the industry's products to gain the market and to increase the market share through online media, events, and other media;
  - (6) ensuring the availability and sustainability of products;
  - (7) ensuring the availability of qualified labors;
  - (8) using the appropriate technology in accordance with the conditions and objectives of the industry and supported by the competent labors in its operation.
2. The strategies to minimize the weakness in reaching the opportunities (Strategy W-O) are:
  - (1) fixing the loading and unloading infrastructure to facilitate the distribution;
  - (2) shortening the chain of product distribution and improvement of distribution channels;
  - (3) increasing the efficiency of production to get the optimal use of energy;
  - (4) issuing the regulations quickly and clearly to facilitate the industrial operations;
  - (5) improving the quality of education to prepare the human resources that meet the market demand.
3. The Strength and Threat (S-T) strategies are:
  - (1) improving the quality of products using the qualified raw material and the quality of human resources, the use of appropriate technology, and the compliance with the existing qualification standards;

*Contd. table 5*

- (2) conducting the research and development so that the local agricultural products are able to be qualified as the industrial raw materials;
  - (3) the development of production capacity through product diversification, with the use of varied raw materials and the innovation;
  - (4) the gradual mechanization of industry to increase the productivity by utilizing the incentives from the government;
  - (5) more intensive socialization in the community through various social media to use and promote the domestic products;
  - (6) ensuring the continuous supply of raw materials while maintaining the environmental sustainability.
- 
4. The W-T strategies, which are the strategy to formulate to minimize the weaknesses of the leading industries and avoiding the threats:
- (1) mapping the logistic, means the benefit whether in terms of time, cost, and accuracy of distribution;
  - (2) providing the incentives for the new investors;
  - (3) providing the incentives for any industry that wants to increase the proportion of local raw materials;
  - (4) providing the incentives for any industry that wants to conduct an innovation based on science and technology;
  - (5) conducting the training of employees to make the productivity increased
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#### 4. CONCLUSION

This study empirically finds the mapping of the manufacturing industry in Central Java province, Indonesia, based on the groups of leading industry, superior industry, prospective industry, and lagging industry. The competitiveness performance of the leading industry's commodity in Central Java province indicates the strong index, except the tobacco manufacturing industry. The results indicate that the market share of the the leading commodity of Central Java in the ASEAN market exhibits the strong position. The policy strategies which are recommended in this study, are expected to strengthen the position of the leading commodity groups as well as encouraging the superior industry and the prospective industry to be the leading and to have competitiveness and a stronger share in the ASEAN market.

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