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# IMPACT OF COMPETITIVENESS ON THE INDUSTRIAL GROWTH OF MANUFACTURING INDUSTRY IN INDONESIA

**Zulfadhli, SE, MSi**
Doctoral Students of Economic Science Department, Faculty of Economics,
Sriwijaya University, Unsri Campus Bukit, Indonesia
& Lecturer of University Tamansiswa Palembang, Indonesia
hertatilesi@yahoo.co.id

**Abstract**

*The purpose of this study was to examine the factors that affect the competitiveness of export products sub-sectors of the manufacturing industry in Indonesia, which consists of labor department of production, technology, capital, product prices, growth in the manufacturing industry, the exchange rate, dummy government policies and dummy crisis. In a study to test the effect on the competitiveness of export products manufacturing industry sub-sector on the growth of the manufacturing industry sub-sectors addressed by the factors of competitiveness of the industry to the growth of manufacturing industry in Indonesia. From this study found empirical evidence that an increase in the labor department of production, technology, capital, the growth of manufacturing industries, exchange rate depreciation and the government policy in the field of manufacturing industry will increase the competitiveness of export products sub-sectors of the manufacturing industry, while the increase in prices and a crisis will reduce the competitiveness of export products sub-sectors of the manufacturing industry. Competitiveness of export products manufacturing industry sub-sector has positive influence on the growth of the manufacturing industry sub-sector industry.*

*Keywords: Industrial Competitiveness, Industry Growth, Manufacturing Sector, Organizational Performance, Indonesia*

## INTRODUCTION

In the era of free trade, has become imperative for any company to survive in the fierce competition (Suryono, 1999). According to Schiller (1997) comparative advantage is the ability of a company or countries to produce goods that are specific to cost opportunities are low compared to other companies or countries. Meanwhile, Dunford , Louri , and Rosenstock (2000) says that the concept of competitiveness is the ability of an industry to compete in the long term, which depends not only on product quality and lower costs, but more of it is based also on the ability to keep pace, determine and evolving market .

Chacholiades (1990) says that a company or country is said to have a comparative advantage when a company or country has a higher advantage in commodities, and has a comparative disadvantage when advantages are low in commodities. According to Tambunan (2001), the average value of RCA above 1 indicates a high level of competitiveness. Meanwhile, the average value of RCA below 1 indicates the level of competitiveness that rendah. Terkait the above context, the manufacturing industry sub-sector is one of the most rigorous sub-sector competition bisnis. Berdasarkan feel it, it can be said that there are still five (5) sub-sectors that have RCA values below 1, showing the low level of competitiveness which is owned by the sub-sectors within the framework of activities of exports and international trade. One of the factors that influence competitiveness is the price. The price level will be determined by the costs incurred by the company. A company if it has a lower cost compared to competitors then it has a competitive edge or advantage in terms of cost. Porter (1994) stated that the cost advantage occurs when the cumulative costs incurred by the company in carrying out activities of value, lower than the cumulative cost of its competitors. Thus, if a low cost, the company can sell at a lower price. Besides the price, the mastery in the field of technology is also a determining factor for the competitiveness of a country's exports, especially in supporting the comparative advantage of the country's export commodities. Significant changes in technology made by some of the industry, which is a change from traditional technology to the advanced technology, has driven an increase in competitiveness of export products produced by these industries. Technology affects the competitive advantage if these technologies have a significant role in determining the relative cost or differentiation position relative.

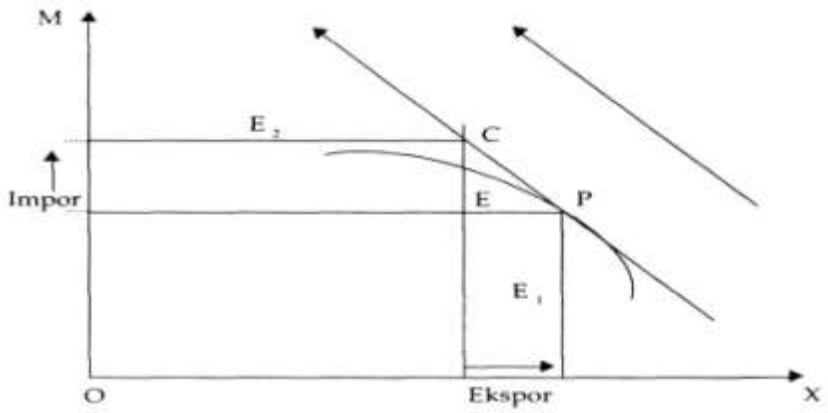
### Concept of Competitiveness Theory

#### *Comparative Advantage*

Model H-O is a model that is more emphasis on the trade balance between the two poles of neo-classical economics. The basic idea of the model H-O is a labor abundant country, in relative terms will utilize her abilities to produce certain goods with labor-intensive production

factors are relatively cheaper. Thus, the country will have a comparative advantage (hereinafter referred to as KK) in producing these goods. Explained that country A has X KK in producing goods that are labor intensive. On the other hand, relatively good X will be higher (expensive) in country B than the state A if those countries use the same factors of production (labor-intensive). International prices for goods X is higher than the price of autarchy (price determined by the government), so that manufacturers have to adjust its output from E to P, while the price line touches only curve Possible Production (CTF) as shown in Figure Output rose at a rate production expenditures M.

Figure 1: Economic Equilibrium Small Country with the Terms of Trade

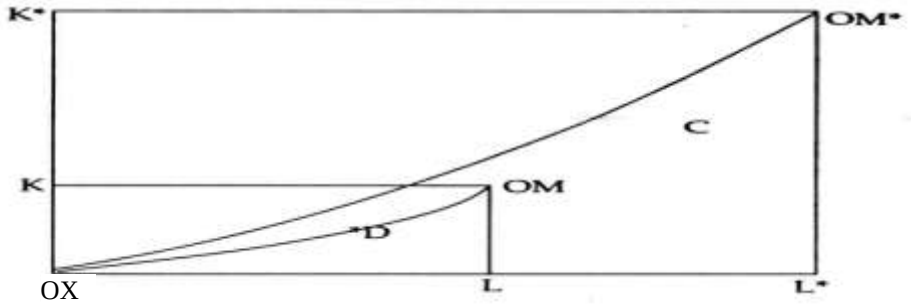



Source: Hendra halwani (2002)

Thus, the real income of consumers can follow their taste buds to reach point C, as seen at the point of tangency social indifference curve. So the trade equilibrium (PC) is different from the equilibrium autarky (EE). (E first in the curve indicates the point of production, whereas the second E indicates the point of consumption). Based on the above, the bottom line is that there are three important assumptions in the international trade balance. First, the assumption related to technology. That the production function is homogeneous (linear homogenous), where the production process shows constant returns to scale. Faktor production of K and L mutually replace (substitution) in the production, so that the production function is categorized normal. Tidak no intensity factors of production are the opposite (no intensity reversal). Penyesuaian (adjustment) occurs with the aim that the economy is always in equilibrium. Proving the theory of H-O begins with a note that the taste, and the price of the goods shown on the free market and consumption patterns of the two countries should be the same. It means also that the ratio K / L in country B will be greater than in country A for the production of M. In other words, if the

ratio of production is the same, then the capital-intensive production will be greater than in the industrial sector for a country of abundant capital.

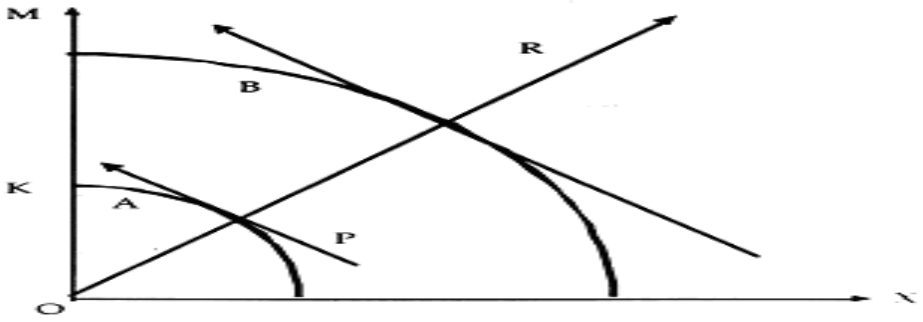
Figure 2: Edgeworth Box




Source: Hendra halwani (2002)

For countries whose production is more capital-intensive, the opportunity cost is lower, then the necessary sacrifices lighter than the goods -intensive production results in strengthening marginal increase the output of goods. Although the pictures do not show differences in the nature of the assumption that the country B is relatively higher than in countries such as distribution OR A CTF round of B is not significant.

Figure 3: Curve Two Possible Production




Source: Hendra halwani, (2002)

Michael E. Porter in his famous book, The Competitive Advantage of Nations (1990), argued about the absence of a direct correlation between the two factors of production (natural resources abundant and cheap human resources) owned by the state, which used to be superior competitiveness in international trade. Many countries in the world whose very large number of their employees is proportional to the area it's country, but backward in international trade competitiveness. The theory of competitive advantage as described above was developed

by Michael E. Porter (1994), a professor at Harvard Business School, USA. How different approach to the macroeconomists in general.

Porter starts from the fact that there is international competition, so the formation of his theory is deductive. Besides the four decisive factor in international competition (international competitiveness), the national competitive advantage is still influenced by Chance (new discoveries, skyrocketing prices, exchange rate changes and security conflicts between states) and the actions or policies of the government. Where the higher the level of competition in a country, the higher the level of international competitiveness. Porter select countries such as United States, Japan, Germany, Italy, then Porter explained that other external factors are the most important and crucial once externally, is the human factor (human resource factor) of a country. Where the human factor is divided into two, namely the system of government (government) and the presence of a chance of doing something (chance events). In connection with the approach of competitive advantages as an alternative concept in the development model that relies on the existence of increasing returns to scale (scale economies increase) due to external factors or externalities, such as the concentration of skilled personnel and certain industrial high added value and monopolistic competition (monopolistic competition).

***Dynamic Comparative Advantage***

In measuring the comparative advantages of a country's export commodities, is used what is called Domestic Resource Cost (DRC) foreign exchange earned. To remind about this comparative advantage where, according to Ricardo version, and version of the Heckscher-Ohlin, declared a state of comparative advantage in producing a product is determined by the cost of production of goods that are determined by the intensity of labor input used. Especially the factors labor and capital in terms of factors of production are abundant in relative terms. The concept of comparative advantage Ricardo version and the version of the H-O is expressed as the concept of comparative advantage is static and less realistic. This is because it implicitly assumes that there is no fundamental change in the factors of production are abundant (endowments), to be their perfect competition in international trade and international capital markets as well as the absence of external influences on the production and komsumsi. Sedangkan theory of comparative advantage of the newer, developed by Schydlowsky in the mid-eighties, has made modifications to the concept of comparative advantage. Schydlowsky put forward the concept of comparative advantage is dynamic (Dynamic comparative advantage), this concept he accommodates the changes that happened and that will happen.

***Factors Determining Competitiveness***

Human resources have a strategic position in driving the economic progress of a nation. The availability of human resources potentially will serve as the driving element of economic progress and competitiveness of a nation. A nation which has human resources are relatively abundant competitiveness will have a relatively superior to countries that lack the resources thus manusia. Walaupun not many countries have the human resources are relatively abundant but do not have the ability to foster economic progress, and does not have competitiveness. Not a few countries that lack the resources relatively but relatively fast and can compete in the global market. The first case with abundant human resources but cannot compete, occurs in most developing countries like Indonesia. If human resources are an element as agents of development, then as perpetrators should receive attention for its development.

Efforts to develop human resources in this era of globalization are very important because in the era of globalization are faced with intense competition and cannot be avoided. Human resource development efforts must be able to adjust to rapid technological developments such as today; although this is not a simple job. Human development is the process of improving human capabilities, the process is concentrated: 6). The evenly on increasing the formation of human abilities through investments in human beings, and the utilization of human capabilities, through the creation of a framework for the participation of generating income and employment promotion (Yudo Swasono and Endang, 1993concept of human resource development (HRD) and the technology is becoming the choice of many countries towards the era of industrialization.

***Factor Technology***

Words related engineering and engineer and comes from the word genie is derived from the Latin word synonymous with genius (smart) or talent (talent). In the initial definition has been realized that the technology related to humans (human) as a user or recipient of an impact. 'Technology' concerned with 'culture', involving applied science, engineering, the institution is also about social, political, cultural and economic systems. Likewise technology closely related to humans and the various factors that influence the thoughts and actions of human beings, individually or philosophical kelompok. Definisi can be seen from Romer (2001: 190-203), which defines the technology as written by Berg, namely: "technology is a complex set of knowledge, ideas, and methods and is Likely to be the result of a variety of different activities, both intentional and accidental." in relation to the production of goods and services, technology tends to be a factor of production which is dominant in improving competitiveness. In the productive use of technology will enhance the competitive advantage of the product. The use of high

technology in machinery, processes, communication, information, promotion and distribution that have proven reliability will improve the competitiveness of these products on the international market. The high technological development should be followed by a working knowledge of the industry to be able to follow and apply it.

**Technology and Competitiveness**

Technology can affect the cost or differentiation and competitive advantage by altering or affecting all determinants of cost or other uniqueness (Porter, 1994: 171). Technological changes that the company will maintain a competitive advantage that has existed if the situation is as follows (Porter, 1994: 173): With this flexibility is not difficult to determine the combined capital and labor in the production yield.

**Level of Competitiveness**

As known, Indonesia and the other developing countries have a comparative advantage in the production of goods of production factors mainly abundant in the country, such as labor (less educated), soil and various kinds of raw materials or natural resources (SDA ). However, the rapid advances in technology and coupled with the efforts undertaken firms in developed countries has been to save the use of labor and raw materials could threaten or even eliminate the comparative advantage possessed developing countries such. As another example, it is feared the advances in the technology of biomass that can fully replace petroleum as a primary source of energy will be a serious threat to the oil exporting countries, such as Indonesia and other OPEC members (Kotler et al, 1997) .In technological advances and efforts in labor savings and other natural inputs (SDA), changes in comparative advantage may also occur due to the increased quality of labor (SDM). Increasing it makes the level of labor productivity and efficiency in the production process increases and increases product quality baik.Salah one indicator that can indicate changes in comparative advantage referred to above is called Revealed Comparative Advantage (RCA) index.

**Empirical Studies**

Many studies have been done with regards to competitiveness (competitiveness), both national and industrial competitiveness, especially the impact on industry growth. Some previous studies on competitiveness can be expressed as follows: The empirical study that has been done related to the model of competitiveness, especially studies that estimate the factors that determine competitiveness. Some of them can be seen from the empirical studies Greaker (2004), Silva and Rodrigues (2005), Sanjaya Lall (2003), Reiljan, Hinrikus, and Ivanov (2000),

Thurow (1992), and empirical studies of Breschi and Palma (2001) , Greaker (2004) examined the relationship between the competitiveness of the industry with the invention of technology and policy environment for companies in Norway. The test results concluded that the discovery of new technologies that can reduce pollution and environmental policies (such as the application of emission limits were tightened and subsidization in the field of environment) can improve the competitiveness of products perusahaan. Silva and Rodrigues (2005) examines the competitiveness and fellowship private companies (competitiveness and public private partnerships).

**FRAMEWORK AND RESEARCH APPROACH**

Dong-Sung Cho (2000: 138) suggests the concept of international competitiveness, which he does not only depend on the issue of labor, capital, natural resources are many, and the price is cheap. These resources are just some of the many determining factors. Cho gives the definition of international competitiveness of national industry is an industry that has superior market with high profits and steady growth when compared to its competitors. Countries that have international competitiveness must have many types of industries with strong competitiveness, not with just one or two successful industry. Classical theory of Adam Smith (Salvatore, 1997) with a model of absolute advantage as just is if ikasi for international trade. According to this theory, a country must export a commodity that can be produced at a lower cost compared with that can be done by other countries. Instead the country has to import a commodity that can only be produced at a cost that is relatively high compared with other countries.

The competitiveness of industrial products for export from a country is determined mainly by: the technology, the level of efficiency / high productivity in the production process, the quality of goods produced, workers with the level of skill / education, economies of scale, innovation, product differentiation, capital and means as well as adequate infrastructure, as well as the distribution network both inside and outside the country. Qualified human resources and has the spirit of entrepreneurship (entrepreneurship) can support the increased competitiveness of export products. Tambunan (2001: 54), suggests that a high level of entrepreneurship is an important factor in determining the level of a country's competitiveness in global trade. The role of qualified human resources in the improvement of competitiveness, can also be seen in the study Thurow (1992), Cooper (1995), Dunford, Louri and Rosenstock (2000).

Besides human resources, mastery in the field of technology is also a determinant of the competitiveness of a country's exports, especially in support of comparative advantage. The country's export commodities; technology affects the competitive advantage if these technologies have a significant role in determining the relative cost or differentiation position

relative. Pricing for a product are the factors that affect the company's market share, because of the price competitiveness positions affect competition and improvement of corporate profits". In equation form , it can be written as follows :

$$DS_{it} = \beta_{10} + \beta_{11}LP_{it} + \beta_{12}T_{it} + \beta_{13}M_{it} + \beta_{14}P_{it} + \beta_{15}PI_{it} + \beta_{16}ER_{it} + \beta_{17}D_{KB_{it}} + \varepsilon_{1it}$$

***Information***

$LP_{it}$ : Labor Part Production

$T_{it}$ : Technology

$M_{it}$ : Cavital

$P_{it}$ : Product Price

$PI_{it}$ : Growth in Manufacturing Industry

$ER_{it}$ : Exchange Rates

$D_{KBit}$ : Dummy Government Policy

$DS_{it}$ : Industrial Competitiveness

$\beta_{10}$ : Constant value

$\beta_{1j}$ : sub- sectors of the manufacturing industry

i : Sub sector industry manufacturer

t : The time period

$\varepsilon_{1it}$ : Error term

With the ever increasing competitiveness of industrial products for export purposes, then these products will have great value in the eyes of buyers (Porter, 1994: 121), so as to push the number of products exported. With the increasing number of products (output) produced and purchased by consumers as a result of increased demand, it will encourage the growth of the industry itself. In other words, improving the competitiveness of export products manufacture industry will be able to influence the growth of the industry manufacture. Empirical studies on the effect of the industrial competitiveness of the industry's growth, it can be seen from the results of research Ippey (2001), Lengyel (2003), Simon (2003), Fagerberg, Knell and Srholec (2004), Marzabal (2004), Hirway and Shah (2006), Greasley and Oxley (2007) and Braum, Briones and Johnson (2007), which reveals that the competitiveness of the industry (industrial competitiveness) could affect industrial growth of a country. Besides the industrial competitiveness, industrial growth was also influenced by variables such as; industrial structures, capital stock (capital) and total labor force, and other variables.

While Dutta and Ahmed (2006) and Hirway and Shah (2006), which proved empirically about the negative influence of labor (total) on the growth of the industry. Based on these descriptions, the growth of the industry, including competitiveness is influenced by (DS), the structure of the manufacturing industry (SI), stock of physical capital (K) and the total labor force (LT), so that the industry's growth equation, can be formulated into:

$$PI_{it} = \beta_{20} + \beta_{21} DS_{it} + \beta_{22} SI_{it} + \beta_{23} K_{it} + \beta_{24} LT_{it} + \varepsilon_{2it}$$

***Information***

$PI_{it}$ : Growth in Manufacturing Industry

$DS_{it}$ : Competitiveness of the Manufacturing Industry

$LT_{it}$ : Labor Part Production and Non- Production

$K_{it}$ : Physical capital stock ( Capital )

$SI_{it}$ : Industrial Structure

$\beta_{20}$ : Constant value

$\beta_{2j}$ : The parameter value sought by j > 0

i : Sub- sectors of the manufacturing industry

t : The time period

$\varepsilon_{2it}$ : Error term

Is the amount of labor in the production of each of the sub- sectors of the manufacturing industry in Indonesia. LP value is obtained by comparing the number of production workers to total employment in each sub- sector of the manufacturing industry in Indonesia.

**Competitiveness Sub Industry sector (DS)**

The competitiveness of the manufacturing industry sub-sector is the ability of producers in the manufacturing industry sub-sector examined in the produce industry have so they can compete in the global market. The competitiveness of the manufacturing industry sub-sector will be proxied by using the RCA (revealed comparative advantage).

Table 1: Identification Test Conditions Order

| Equation | (K – k) | (m – 1) | Analysis | Identification |
|---|---|---|---|---|
| Model 1 | 10 – 7 = 3 | 1 – 1 = 0 | $(K - k) \geq (m - 1)$ | *Over identified* |
| Model 2 | 10 – 4 = 6 | 2 – 1 = 1 | $(K - k) \geq (m - 1)$ | *Over identified* |

In the study, only a system of equations that contain equations that can be identified are reasonable (just identified or exactly identified) and identified excessive (over -identified) can be estimated (Intriligator, Bodkin, and Hsiao, 1996: 323 and Sritua Arief, 1993: 83). In fact, the equation identifiable berlebihanlah (over -identified) are often encountered in each study. Valuation parameters in the regression model of simultaneous equations is done by applying the OLS method to the equation that has undergone the transformation. Based on structural equation model can be formed reduced form equation model, as follows :

$$DS_{it} = \beta_{10} + \beta_{11}LP_{it} + \beta_{12}T_{it} + \beta_{13}M_{it} + \beta_{14}P_{it} + \beta_{15}ER_{it} + \beta_{16}D_{KBit} + \beta_{17}LT_{it} + \beta_{18}K_{it} + \beta_{19}SI_{it} + \varepsilon_{1it}$$

$$PI_{it} = \beta_{20} + \beta_{21}LP_{it} + \beta_{22}T_{it} + \beta_{23}M_{it} + \beta_{24}P_{it} + \beta_{25}ER_{it} + \beta_{26}D_{KBit} + \beta_{27}SI_{it} + \beta_{28}K_{it} + \beta_{29}LT_{it} + \varepsilon_{2it}$$

By using the value of regression coefficients obtained through a calculation for the OLS reduced form equations above (ie values $\pi$), the obtained estimated values for endogenous variables ie. In the second stage, substitute into the system of simultaneous equations (3.3) to (3.4). After the substitution process is completed, then apply OLS to the equation that has been substituted to obtain the results of the regression model of simultaneous equations (Sritua Arief, 1993).

## ANALYSIS AND RESULTS

### Developments Competitiveness of Manufacturing Industry sub-sector (in the RCA index)

The era of globalization and economic liberalization has brought renewal very fast and far-reaching impact on the economy, both domestically and internationally. Felt the most impact is the increasing competition in the industrial sector. To build the industrial sector in order to grow in the arena of competition like this and at the same time making it as a driving force of the national economy in the future, then the industrial sector need to have high competitiveness in terms of value added and productivity along the value chain of production. Competitiveness is the ability of companies and industries to generate income factor and the factor of relatively high employment and sustainable for the face of international competition. Increased industrial competitiveness in a sustainable manner can form the foundation for a strong economy in the form of macro-economic stability, the business climate and a sound investment. International competition is a new perspective for all countries so that the focus of the strategy of industrial development in the future is to build the competitiveness of sustainable manufacturing industry in the international market.

According Hamsar Lubis (2006), there are several important issues that reduce the competitiveness of Indonesian manufactured products (Dhanani, 2000), namely; (1) the difficulty traditional exports due to competition with other countries and the trend of declining prices of primary products, (2) the inability of Indonesian producers to reduce production costs

associated with higher imports of inputs, (3) too little kind of a flagship product and the limited export destination, (4 ) is too small production of capital goods and inputs, (5) the lack of deepening of production technology, (6) the electronics industry is growing rapidly just as the assembly industry that enjoys cheap labor. While the main cause of a decline in competitiveness by Tulus Tambunan (2007), which are: First, as the results of several studies on RCA, shows that commodity Indonesian manufacturing industry increased its market share in the world and actually becomes the belle of exports, is still dominated by tech products as simple as wood products industry (ISIC 33); and textile industries, leather and apparel (ISIC 32) that compete with products from China and other ASEAN countries. Second, the decline of the competitiveness of the manufacturing industry sub-sector is also due to the increased costs of production overhead. Based on identification by a Japanese company, if the production costs of manufacturing Indonesia was given an index of 100, then China is only about 62, the Philippines 77, Malaysia 79, and Thailand 89. The cost structure of manufacturing production Indonesia is also very vulnerable which reached 33.4 overheads and costs for material reached 58.3. In comparison: overhead in China is only 17.1 and 39.9 only material. (Tulus Tambunan, 2005).

**Manpower Development Sub-Sector Manufacturing Industry**

Production workforce is a major factor together another factor that will determine the level of output and competitiveness of the manufacturing industry sub-sector. While the total labor force is one of the factors that determine the growth of the industry sub-sector of the manufacturing industry. workers in the production of each sub-sector of the manufacturing industry. As shown in Table, It can be seen that from an average of 3.5 million workforce production section, the majority (33.22 per cent) is concentrated in sub-sectors of the textile industry leather goods and apparel (ISIC 32) that as many as 1 , 2 million people, the food industry, beverages and tobacco (ISIC 31) as many as 688 thousand people (19.61 percent), chemical industry, rubber and plastic goods (ISIC 35) amounted to 384 thousand people (10.95 percent). Meanwhile, the concentration of labor smallest production section contained in the base metal industry, iron and steel (ISIC 37) by 33 thousand people (0.94 percent).

**Simultaneous Bias Test (Hausman Test)**

Hausman test is used to determine whether the model equations used can be treated as a simultaneous equation or not. Therefore, Hausman test is only performed on the simultaneous equations to determine whether the bias simultaneous equation or not. Results of the Hausman test to the simultaneous equation model, shown on the table below:

Table 2: Results Hausman Test for Simultaneous Equation Testing

| Equation | F-test | Probabilitas | Specification |
|---|---|---|---|
| DS | 19,4008 | 0,0000 | simultaneous *** |
| PI | 10,3384 | 0,0000 | simultaneous *** |

* ) ** ) *** ) Critical values significant at 10 % , 5 % and 1 %

Based on these test results above, it appears that all the equations (equations DS and PI) showing simultaneous bias. Therefore, all the equations are estimated using 2SLS method.

**Endogeneity Test**

Basically, endogeneity test Hausman test is used to confirm that the placement of endogenous and exogenous variables in a model of simultaneous equations is correct. As with Hausman test, endogeneity test is only applied to the simultaneous equations. The test results endogeneity of all simultaneous equations model, shown in the Table. below this:

Table 3: Results of Endogeneity Test for Simultaneous Equation Testing

| Equation | F-test | Probabilitas | Specification |
|---|---|---|---|
| DS | 20,0310 | 0,0000 | *Endogen* |
| PI | 8,7984 | 0,0000 | *Endogen* |

Based on these test results above, it appears that all the endogenous variables in the system of simultaneous equations is right to be treated as an endogenous variable because the value of F-test probability is smaller than alpha = 0.05. Thus, it can be concluded again that all equations (equations DS and PI) were used in this study are eligible simultaneously. Therefore, all these equations can be estimated using 2SLS method. The full results of the endogeneity test can be seen in

**Estimation Results Equation Competitiveness Factors**

Based on test results using E-views 5.0 program the research model factors of competitiveness, showed that LP, T, M, PI, ER and DKB has a positive and significant sign of the DS. While P and DK has a negative sign and significant to the DS. DK value is negative and significant, indicating that the economic crisis had a negative and significant effect on the competitiveness of each sub-sector of the manufacturing industry in Indonesia.

The test results for the FEM model of factors of competitiveness of the manufacturing industry sub-sector in Indonesia showed a positive intercept values of 0.3218 and statistically significant so as to give the conclusion that there is a difference between the intercepts of the

manufacturing industry sub-sector in Indonesia , while the slope is not , While based on the average value of the fixed component error cross section for each sub-sector shows that the manufacturing industry sub- sectors of textile, leather goods and apparel ( ISIC 32 ) has an average value error fixed component cross section of 11.13455 and the highest lowest is sub sectors transport equipment, machinery and equipment ( ISIC 38 ) of -4.2463 .

Table 4: Fixed Effect Model of Competitiveness Factors

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LP? | 0.044741 | 0.019100 | 2.342461 | 0.0242 |
| T? | 8.640723 | 1.633770 | 5.288825 | 0.0000 |
| M? | 0.021623 | 0.010515 | 2.056396 | 0.0452 |
| P? | -0.029444 | 0.004317 | -6.820477 | 0.0000 |
| PI? | 0.027441 | 0.010844 | 2.530524 | 0.0213 |
| ER? | 0.000189 | 0.000078 | 2.423077 | 0.0232 |
| DKB? | 1.656470 | 0.621789 | 2.664039 | 0.0185 |
| DK? | -0.136324 | 0.035828 | -3.804957 | 0.0095 |
| C | 0.321850 | 0.111500 | 2.886547 | 0.0112 |
| **Fixed Effects (Cross)** | | | | |
| _31--C | -2.669202 | | | |
| _32--C | 11.13455 | | | |
| _33--C | -1.547485 | | | |
| _34--C | -3.938024 | | | |
| _35--C | -3.501683 | | | |
| _36--C | -3.403597 | | | |
| _37--C | -2.839984 | | | |
| _38--C | -4.246332 | | | |
| _39--C | 11.01175 | | | |

The value of the intercept coefficient fixed effect for each sub-sector in the model factors of competitiveness of the manufacturing industry in Indonesia can be seen in Table the following:

Table 5: Estimated Coefficient Value Table intercept each sub-sector Factors in the Model Competitiveness in Indonesia

| Intersep | Coefficient | Conclusion |
|---|---|---|
| _31--C | -2.669202 | C is significant at alpha level of 5 % |
| _32--C | 11.13455 | C is significant at alpha level of 5 % |
| _33--C | -1.547485 | C is significant at alpha level of 5 % |
| _34--C | -3.938024 | C is significant at alpha level of 5 % |
| _35--C | -3.501683 | C is significant at alpha level of 5 % |
| _36--C | -3.403597 | C is significant at alpha level of 5 % |
| _37--C | -2.839984 | C is significant at alpha level of 5 % |
| _38--C | -4.246332 | C is significant at alpha level of 5 % |
| _39--C | 11.01175 | C is significant at alpha level of 5 % |

Based on Table mentioned above, it can be interpreted that if there is no change in the independent variables in the model (independent variables, LP, T, M, P, PI, ER, and DKB not develop / equal to zero), then the value of the intercept RCA (ceteris paribus) , in the sub-sector is sebesa -2.6692 31, sub-sector 32 of 11.1346, -1.5474 sub-sector amounted to 33, 34 of -3.9380 sub-sector, sub-sector 35 amounted to -3, 5017, subsectors 36 by -3.4036, -2.8399 sub-sector amounted to 37, 38 of -4.2463 sub-sector and sub-sector 39 amounted to 11.0118.

Based on the table above, it appears that there are two sub-sectors are still potential to be developed because they have a competitive edge that can be relied upon, namely the sub-sector 31 (textiles, leather goods and apparel) to the value of the intercept RCA amounted to 11.13455 and subsectors 39 (industrial other processing) with the value of the intercept RCA amounted to 11.01175. Likewise with the sub-sector 31 (of food, beverages and tobacco), sub-sectors 35 (chemical industry, rubber products and plastic), subsectors 36 (mineral products non-metallic), subsectors 37 (base metals, iron and steel), as well as 38 sub-sectors (transport equipment, machinery and equipment), which also has a negative value of the intercept FEM, relatively less long-term basis has the potential to grow further. Furthermore, by testing the consistency of the direction coefficient, it can be known whether the direction coefficient according to the research results of the proposed research hypothesis or not. Testing directions coefficient is done by comparing the direction coefficient of economic research with the hypothesis that has been stated previously. The result of testing directions coefficients for equation factors of competitiveness, it appears as Table.

Table 6: Testing Directions Coefficient Equation Competitiveness Factors (DS)

| Variable | Directions Coefficient (Hypothesis) | Directions coefficient (Research) | Conclusion |
|---|---|---|---|
| LP | + | + | Directions coefficient is consistent with the hypothesis |
| T | + | + | Directions coefficient is consistent with the hypothesis |
| M | + | + | Directions coefficient is consistent with the hypothesis |
| P | – | – | Directions coefficient is consistent with the hypothesis |
| PI | + | + | Directions coefficient is consistent with the hypothesis |
| ER | + | + | Directions coefficient is consistent with the hypothesis |
| DKB | + | + | Directions coefficient is consistent with the hypothesis |

Based on the above table is known that all the variables have coefficients correct direction (consistent) in accordance with the hypothesis put forward for competitiveness (DS). For further explanation of the table; viewed from the significance testing found that the variable LP, T, M, P, PI, ER, and DKB both individually and simultaneously significantly affect competitiveness (DS) on $\alpha$ = 5 percent, as indicated by the p-value. Based on these results we can conclude that the

independent variable partially or jointly influence on the dependent variable, DS. Meanwhile, the test results showed R2 value of 0.8590. The figure indicates that the variation of the dependent variable changes only able to be explained about 85.90 percent by the variation of the independent variable changes. In other words, there are still approximately 14.10 percent of the variation dependent variable changes caused by other factors outside the equation factors of competitiveness.

**Validity Testing Assumptions OLS Competitiveness Factors**

Jarque-Bera test is used to ensure trouble-free estimation equation irregularities assumption of normality. Normality test results showed that all variables in the equation factors of competitiveness show a value much lower than the value $\chi$2-table ($\alpha$ = 0.05; df = 126) amounted to 35.256. Jarque-Bera value respectively (LP = 4.1889; T = 4.6172; M = 7.8123; P = 4.2246; PI = 8.2215; ER = 16.7195; and DKB = 21 3034). Thus, it can be concluded that the estimating equations competitiveness factors used free of irregularities assumption of normality.

**Estimation results Equation Manufacturing Industry Growth**

Based on test results using Eviews 5.0 program the research model of growth in the manufacturing industry, showed that the DS, SI and K has a positive and significant sign of the PI. While LT has a negative and significant value to the PI for each sub-sector of the manufacturing industry in Indonesia.

The test results for the FEM model of the growth of manufacturing industries in Indonesia showed a positive intercept value of 16.7238 and thus providing a statistically significant conclusion that there is a difference intercept between subsectors of industrial growth in Indonesia, while the slope is not. While based on the average value of the fixed component error cross section for each sub-sector shows that the sub-sector other manufacturing industries (ISIC 39) has an average value error fixed component cross section 29.2224 of the highest and lowest sub-sector of textile, leather goods and apparel (ISIC 32) of -5.5859.

Table 7: Fixed Effect Model Manufacturing Industry Growth

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DS? | 0.149242 | 0.052257 | 2.855924 | 0.0119 |
| SI? | 0.054954 | 0.022376 | 2.455935 | 0.0322 |
| K? | 10.61587 | 4.177301 | 2.541323 | 0.0208 |
| LT? | -0.212820 | 0.058769 | -3.621297 | 0.0192 |
| DK? | -41.59150 | 20.20421 | -2.058556 | 0.0419 |
| C | 16.72378 | 5.407840 | 3.092506 | 0.0101 |
| **Fixed Effects (Cross)** | | | | |

Table 7...

| | |
|---|---|
| _31—C | -2.597063 |
| _32—C | -5.585923 |
| _33—C | -10.07370 |
| _34—C | -3.478889 |
| _35—C | -4.745623 |
| _36—C | 2.725161 |
| _37—C | -0.299587 |
| _38—C | -5.166783 |
| _39—C | 29.22241 |

Source: Data Olah using Eviews 5.0

The value of the intercept coefficient fixed effect for each industry sub-sector growth models of manufacturing industry in Indonesia can be seen in the following table:

Table 8: Estimated Coefficient Value Table Intercepts Each Sub Industry Sector in the Manufacturing Industry Growth Model

| Intersep | Coefficient | Conclusion |
|---|---|---|
| _31--C | -2.597063 | C is significant at alpha level of 5 % |
| _32--C | -5.585923 | C is significant at alpha level of 5 % |
| _33--C | -10.07370 | C is significant at alpha level of 5 % |
| _34--C | -3.478889 | C is significant at alpha level of 5 % |
| _35--C | -4.745623 | C is significant at alpha level of 5 % |
| _36--C | 2.725161 | C is significant at alpha level of 5 % |
| _37--C | -0.299587 | C is significant at alpha level of 5 % |
| _38--C | -5.166783 | C is significant at alpha level of 5 % |
| _39--C | 29.22241 | C is significant at alpha level of 5 % |

Based on the above table, it can be interpreted that if there is no change in the independent variables in the model (independent variables are DS, SI, K, and LT did not evolve / equal to zero), then the value of the intercept PI, in the sub-sector amounted to 31 -2 , 5971, 32 by -5.5859 sub-sector, sub-sector 33 of -10.0737, sub-sector 34 of -3.4789, sub-sector amounted to -4 35, 7456, 36 sub-sector amounted to 2.7252, subsectors 37 by -0.2996, -5.1668 sub sector 38 and sub-sector amounted to 39 at 29.2224.

Judging from the slope value of each independent variable, it can be interpreted that any increase in competitiveness as measured by the RCA index, the index is equal to one unit will increase the growth of the industry in each sub-sector of manufacturing industry average of 0.1492 per cent, any increase in industry structure as measured by the ratio of the output sub-sectors of the manufacturing industry divided by the total output of the manufacturing sector, which amounted to 1 per cent it will increase the industrial growth in each sub-sector of the manufacturing industry average of 0.0550 percent, every increase capital stock of inventory

accumulation as measured by real GDP divided GFCF, which amounted to 1 per cent it will increase the industrial growth in each sub-sector of the manufacturing industry average of 10.6159 percent, any reduction in the total workforce in the manufacturing industry sub-sector of 1 people will increase the growth of the industry in each sub-sector of manufacturing industry average of 0.2128 percent and each of the economic crisis will lead to decline in industrial growth in each sub-sector of the manufacturing industry average of 41.5915 percent.

Judging from the FEM models for the growth of manufacturing industry, it appears that there are two sub-sectors that have a positive intercept values, namely sub-sector 39 (other processing industries) and 36 sub-sectors (non-metallic mineral products). That is, the two sub-sectors of the industry, there is still potential for the growth of industry in the future. Thus, it can be said that the sub-sector 39 (other manufacturing industries) potential competitiveness and industry allowed can grow in the future, while for subsectors 36 (mineral products non-metallic), although less has the potential competitiveness, but still have likely to evolve in the future.

**DISCUSSION**

The value of R2 of 0.8591 the figure indicates that the variation of the dependent variable changes were able to be explained about 85.91 percent by the variation of the independent variable changes. Thus the ability of independent variables in explaining the dependent variable is equal to 85.91 percent. While the remaining 14.09 percent of the variation is explained by other variables not examined in the equation is. One result of this research is the positive influence workforce for the competitiveness of the production sub-sectors of the manufacturing industry. This means greater quality workers in production, the more can increase the competitiveness of export products sub-sectors of the manufacturing industry. The results of the study are consistent with empirical studies of Thurow (1992), Cooper (1995) and Dunford, Louri and Rosenstock (2000) which states that a qualified workforce in the production section is a supporting factor increasing the competitiveness of the manufacturing industry.

In the diamond model proposed by Porter (1994), explained that one of the factors that cause a country can achieve competitive advantage (competitiveness) of their exported products are state of the factors of production (factor conditions) such as skilled labor and infrastructure. Further Porter explained that the rich or the many natural resources of a country, the stronger the competitiveness of the country; besides that the labor factor determining the quality of a country's competitiveness of manufacturing industry. Factors qualified workforce can improve increasing returns to scale (increasing economies of scale) because the concentration of skilled labor and certain high value-added industries and monopolistic competition (monopolistic competition). The results also are consistent and supportive empirical studies of

Thurow (1992), Cooper (1995), Reiljan, Hinrikus and Ivanov (2000), Dunford, Lauri and Rosenstock (2000), Breschi and Palma (2001), Sanjaya Lall (2003), Godin (2004), Pearce (2006), Narula (2006), Ernst (2006) and Reddy (2006), which states that technology has positive effect in improving the competitiveness of export products.

**Effect Equation Competitiveness, Industry Structure, Capital and Labor total against the growth sub-sector Manufacturing Industry in Indonesia**

Overall, variable competitiveness (DS), the structure of the industry (SI), capital (K) and the total labor force (LT), appears to show the results of which are fully consistent with the hypothesis, particularly those related influence on the growth of the manufacturing industry. For example, one conclusion is important results of empirical studies is that the competitiveness of export products manufacturing is a key determinant of industrial growth, as stated by Ippey (2001), Lengyel (2003), Simons (2003), Fegerberg, Knell and Srholec (2004), Marzabal (2004), Hirway and Shah (2006), Greasley and Oxley (2007) and Braun, Briones and Johnson (2007), who discovered the empirical fact that industry competitiveness has a positive and significant impact on the growth of the industry is an industry negara. Struktur other important factors are considered influential on the growth of the industry and explains the high and low growth in the industry. The results of this study are consistent with empirical studies beforehand of Simons (2003), Suslova and Volckova (2007), Greasley and Oxley (2007), and Braun, Briones and Johnson (2007), which indicates that the industrial structure positive and significant effect on the growth of the industry, A positive direction indicates that the greater the concentration of the industrial structure of the manufacturing industry sub-sector it could have a positive impact on the growth of the industry.

Meanwhile, the industrial growth was also influenced by capital. The results of this study prove that and be consistent with empirical studies of Ohno and Imaoka (2004), Athukorala and Jayasuriya (2004), Dutta and Ahmed (2006), Hirway and Shah (2006) Suslova and Volchkova (2007), as well as Greasley and Oxley (2007), that industrial growth was positively affected by the level of capital. With the increasing accumulation of capital that can be held by the manufacturing industry then it will increase the growth of the industry. It could be argued that the capital is one of the factors that can lead to improved performance in the industry and the resulting output so as to drive industry growth. Conversely, when the capital held low, the performance of the industry concerned are less productive and are not optimal in producing output. Furthermore, the total labor force (LT) is other important factors that affect the growth of the industry. Almost no economists who doubt the importance of labor (qualified) for industrial growth. The involvement of the labor factor in the production process can increase the output

and industrial growth. The labor force participation in the manufacturing industry can raise output, which in turn increases the rate and the growth rate of the industry. Thus, labor is a key factor for industrial growth.

## CONCLUSION

The results of the analysis and discussion of the theme of the research, it can be the conclusion the influence of factors of competitiveness to the competitiveness of the manufacturing industry in Indonesia at the 5% significance level, the period 1993 to 2006, is the labor of the production has a positive and significant impact on the competitiveness of products export sub-sectors of manufacturing industry in Indonesia. Technology has a positive and significant impact on the competitiveness of export products manufacturing industry sub-sector in Indonesia. Capital has a positive and significant impact on the competitiveness of export products manufacturing industry sub-sector in Indonesia. The price level of products has a negative and significant impact on the competitiveness of export products manufacturing industry sub-sectors in the manufacturing industry Indonesia. Pertumbuhan has positive and significant impact on the competitiveness of export products manufacturing industry sub-sector in exchange Indonesia. Nilai has a positive and significant impact on competitiveness product export sub-sectors in the manufacturing industry in the field of industrial Indonesia. Kebijakan government has a positive and significant impact on the competitiveness of export products manufacturing industry sub-sector in Indonesia. The economic crisis has a negative and significant impact on the competitiveness of export products manufacturing industry sub-sector in Indonesia. It is hoped that this study can be researched again by further research by the same method of analysis of different units.

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