**PRIMANOMICS : JURNAL EKONOMI DAN BISNIS** - VOL. 21. NO. 1 (2023)
Versi Online Tersedia di : https://jurnal.ubd.ac.id/index.php/ds
| 1412-632X (Cetak) | 2614-6789 (Online) |

# Developing The Competitiveness Model of The Palm Oil-Based Fatty Acid and Fatty Alcohol Industry in Indonesia Using Porter's Diamond Cluster Competitiveness Model

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## ABSTRACT

The definition of oleochemicals is a source of chemicals made from natural oils or fats, derived from animals or plants. Oleochemicals derived from palm oil are fatty alchohols and acid which are currently widely used. The purpose of this research is to develop model of diamond clusters from Porter to see the competitiveness of industries based on fatty acids and fatty alcohols derived from palm oil in Indonesia. From this research, data is generated showing that based on the model used, namely the industrial competitiveness model, there are several sub-factors with "good" status and other sub-factors with "bad" status. In shaping the competitiveness of the palm oil-based fatty acid and fatty alcohol industry in Indonesia, the "good" sub-factor is used. while the weakness that comes from the "bad" sub-factor can reduce the competitiveness of the palm oil-based fatty acid and alcohol, so it is necessary to maximize the good sub-factors.

**Keyword:** competitiveness model, diamond cluster, fatty acid, fatty alcohol

## PRELIMINARY

The world's need for palm oil is increasing from year to year because palm oil is both used for food and feed, and as raw material for fiber and energy. The increasing demand for palm oil has boosted palm oil producing countries to increase their production. The world's palm oil production has exceeded soybean oil production since 2004.

The palm oil industry in Indonesia has grown notably since last few decades. Indonesia has become largest palm oil manufacturer in the world, since 2006. Indonesia together with Malaysia controls the world's production of palm oil not less than 85% from all.

Contribution of palm oil in Indonesia's non-oil exports has been increasing from time to time. The palm oil industry has become more important driving factor in Indonesia's economic growth. State revenues contributed by the palm oil industry are also significant which are export duties, corporate income taxes, land and building taxes, value added taxes, etc. (Pahan, 2011)

Oil palm plantations yield raw materials such as fresh fruit bunches (FFB) which are then processed further at the factory into semi-finished products, such as CPO = Crude Palm Oil and CPKO = Crude Palm Kernel Oil. Semi-finished products are then processed into finished roducts (food/edible products and non-food/non-edible products) in the downstream processing industry to provide added values.

According to (Arianto, 2011), the palm oil industry in Indonesia, both in the upstream and downstream sectors, has bright prospects due to these reasons:

1. The need for vegetable oil is remarkable and will continuously increase in line with the increasing world population.
2. Among vegetable oil producing plants, oil palm has the highest oil production yield. Even by using state-of-the-art plant breeding programs, this yield can still be increased.
3. Indonesia has various comparative advantages, including the availability of land with a suitable climate for the expansion of oil palm plantations and the availability of relatively low labor costs in large quantity.

4. Conducive deregulation and debureaucratization policies related to oil palm.
5. The development of the types of upstream oil palm industry and downstream oleochemicals and food (oleofoods) industries, types of semi-finished goods to finished goods, even as fuel (biodiesel).

CPO and CPKO are utilized as raw materials for producing consumer products, both food and non-food. Indonesia's CPO and CPKO production is now the largest in the world. Unfortunately, Indonesia produces fewer types of palm oil-based products than Malaysia.

Eventhough as the world's largest producer of CPO/CPKO, Indonesia is still unable to surpass Malaysia in terms of exports of palm oil-based products. Malaysia has exported various palm oil-based products with high added value, while Indonesia is still large in exporting CPO/CPKO. Exports of Indonesian palm oil in crude form (CPO/CPKO) resulted in added value for downstream palm oil products enjoyed by export destination countries, such as China, India, the European Union, and Malaysia (Pahan, 2011)

Oleochemicals are derived from natural oils or fats, such as animals or plants. Which consisting of fatty acids, fatty alcohols, , fatty amines, fatty methyl esters and glycerin that we call Olechemicals. Oleochemicals can be derived to become products for instances solid soaps, detergents, shampoos, softeners, cosmetics, plastics additives, a rubber, lubricants, and other products. (Yoyo, 2014)

The world demand for oleochemical products, especially fatty acids and fatty alcohols continues to increase time by time because of the increasingly diverse use of oleochemical products in various daily necessities, the world population increasing number, and the increasing of middleclass population and per capita's number of income from many countries. The increasing demand for natural fatty acids and alcohols in the world is also due to several advantages. It has compared to petrochemical products (chemicals that comes from petroleum), namely cheaper prices, come from sources that can be renewable, and products produced from it are more environmentally friendly. (Yoyo, 2014)

Considering that Indonesia's export portion compared to Malaysia's is still smaller export for fatty acids and fatty alcohols, this means that, the potential for improving and developing of the palm oil-based fatty acid and fatty alcohol in the future is widely open for Indonesia. Moreover, this industry in Indonesia has abundant raw material support since Indonesia known as the world largest producer of CPO/CPKO.

Therefore, it is very important and urgent to research and develop the competitiveness model for the palm oil-based from fatty acid and fatty alcohol industry in Indonesia. It is expected that this industry will be able to compete with similar products internationally in the near future.

## THEORETICAL BASIS

Before 1980, tallow (fat from beef) was the main raw material to produce fatty acids in the areas of Europe and North America. Since 1980, its role decreased along with the beef consumption declining growth. Tallow in Europe is also connected to mad cow disease and foot and mouth disease resulting in restrictions on its usage and the increase of consumer concern replacing the use of tallow to palm oil-based products, particularly for more sensitive products, for instance body treatments (Schwab, 2012)

Unlike fatty acids, fatty alcohols can be derived from natural oils and fats as well as from petroleum (called synthetics, knows as one of petrochemicals) (APOLIN, 2021)

Many literatures discussed the country's competitiveness by emphasizing on the economic performance by measuring the amount of gross domestic product (GDP) per capita (productivity) and also trade performance. The concept of competitiveness enriched economic knowledge via trade and growth theory (Ogrean, 2010) A country competitiveness is a bunch of factors, policies, and institutions that has impact on the level of country productivity (Schwab, 2012) stipulate competitiveness as the capability of a sector, industry, or company to successfully compete in achieving continuous and long-term growth in a global environment.

Study on the competitive advantage of palm oil-based products particulary oleochemicals in Indonesia has been conducted by (Yoyo et al., 2014)The objectives of the study were identifying and describing the performance of oleochemical industry in Indonesia, analyzing the drivers of the Indonesian competitive advantage of the CPO-based oleochemical industry, and formulating better strategies for policy makers to be able to increase the competitive advantage of the industry.

## RESEARCH METHOD

The competitiveness model to the palm oil-based fatty acid and fatty alcohol industry in Indonesia was built based on the diamond cluster competitiveness model made by Porter (Porter, 1998).

Therefore, the stages of the study carried out according to the diamond cluster competitiveness model to produce the competitive advantage of the industry are (Porter, 1990):

1. Recognize factor conditions: which factors that can assist and can not assist to the competitiveness of the palm oil-based fatty acid and fatty alcohol industry in Indonesia.
2. Recognize demand conditions: factors that assist and do not assist the demand for the palm oil-based fatty acids and fatty alcohols in Indonesia.
3. Recognize the company's strategy, rivalry and structure : factors related as one of the company's strategy, rivalry and structure, that are favorable and unfavorable to the model of competitiveness of the palm oil that based to fatty acid/fatty alcohol industry in Indonesia.
4. Recognize supporting and related industries: factors related and supporting that assist and do not assist the model of competitiveness from palm oil-based fatty acid with fatty alcohol industry in Indonesia.
5. Recognize government factors: factors related to the government that assist and do not assist the model of competitiveness based palm oil on fatty acid also fatty alcohol industry in Indonesia.

6. Recognize chance factors: factors related to opportunities that assist and do not assist the model of competitiveness for the palm oil-based fatty acid also fatty alcohol industry in Indonesia.

## RESULTS AND DISCUSSION

### Palm Oil Based Fatty Acid and Fatty Alcohol Industry Competitiveness Model in Indonesia

The competitiveness model from the palm oil-based fatty acid/fatty alcohol industry in Indonesia was built based on the diamond cluster competitiveness model made by Porter. The model encompasses factor conditions, demand conditions, competitive conditions in the context of company (country) rivalry and strategy, supported and related industries, factors from government, and factors chance to generate industry's competitive advantage. When the data show that the palm oil price also has a positive effect on the stock price. (Arintoko, 2021)

These factors are interacting, interrelating, and influencing with each other. The sub-factors within these five factors with each other have the influence. The chance factor affecting as the only one to the other factors, but it is very small or almost not influenced the other.

The results of the development from model of competitiveness the palm oil-based to fatty acid with fatty alcohol industry in Indonesia are shown in Figure 1. It can be seen that within each factor there are many sub-factors whose current status is good so that they become a strength in shaping the competitiveness of the palm oil-based fatty acid and fatty alcohol industry in Indonesia. However, there are still a lot of sub-factors that must be rectified soonest because their status is still weak so that it can reduce the competitiveness of this industry in Indonesia.

### Factor Conditions

Factor conditions that assist the competitiveness of the palm oil-based fatty acid with fatty alcohol industry in Indonesia, including support for the availability of

raw materials with the existence of an export duty (BK) policy and ease of financing in terms of availability and access to financing sources, as well as competitive costs of financing. The factor conditions that do not assist the competitiveness of the palm oil-based fatty acid with fatty alcohol industry in Indonesia are the business high cost, especially indirect costs, the lack of skilled labor, the problem of utility supplies we also know as gas, electricity and water, especially in terms of continuity and quality of supply, insufficient public infrastructure (roads, bridges, ports, railways) in terms of availability and quality, and the lack of information, communication and technology (ICT) infrastructure regarding both availability and quality.

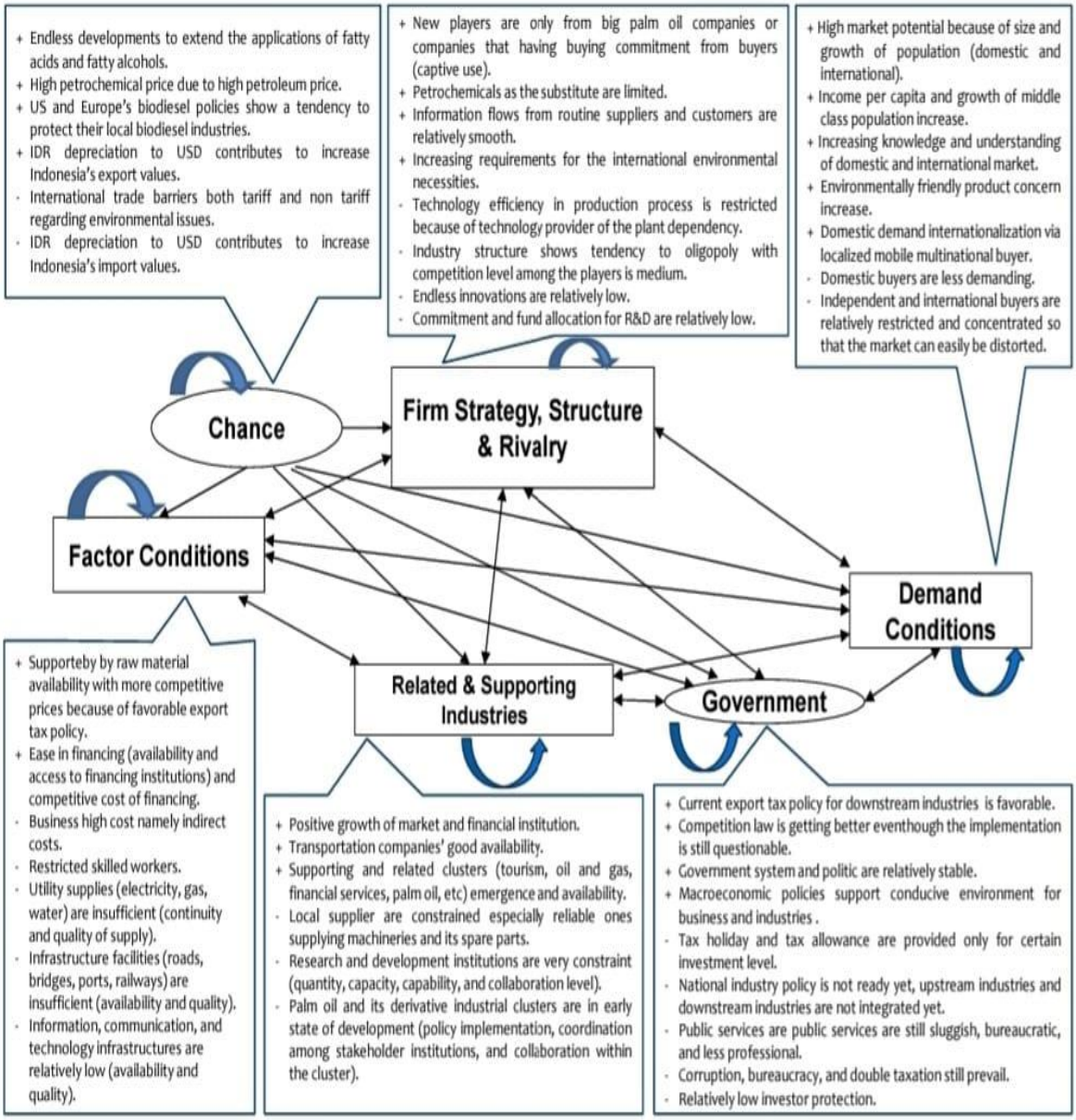
**Demand Conditions**

Regarding demand conditions, the assisting factors are population size and growth (domestic and global) creating a high potential market, increasing per capita income which contributes to increasing the number of middleclass population, increasing knowledge and understanding of domestic and global markets, increasing demand for more environmentally friendly products, internationalization of domestic demand is carried out through domestic multinational mobile buyers. The demand conditions that do not assist the competitiveness of the palm oil-based fatty acid and fatty alcohol industry in Indonesia are that domestic demand is still relatively modest and less demanding and global independent buyers are relatively limited and concentrated so that the market can be distorted.

**Firm Strategy, Rivaldy and Structure**

In relation to competitive conditions in the context of corporate strategy and rivalry, the assisting factors are the entry of new competitors limited to large palm oil players or companies that already have a commitment from potential buyers (captive use), only a few substitute products especially for fatty alcohol, information flow from suppliers and customers quite smoothly, especially from

regular suppliers and customers, and increasing compliance with environmental standards. The factors that do not assist the model of competitiveness to the palm oil from fatty acid and fatty alcohol industry in Indonesia are limited technological efficiency in the production process due to it depends on the provider of factory manufacturing technology, the industrial structure that leads to an oligopoly with a medium level of competition, low level of continuous innovation, and low commitment and allocation of funds for research and development (R&D).



Description: Notation + means strength and notation – means weakness

**Figure 1. Competitiveness model for the palm oil that based of fatty acid and fatty alcohol industry in Indonesia**

**Related and Supporting Industries**

Related and supporting industry factors that assist the competitiveness to the palm oil based to fatty acid and alcohol industry in Indonesia are positive developing markets and financial institutions, good availability of transportation companies, and the existence and emergence of related and supporting clusters such as tourism, oil and gas, and financial services, eventhough in average the development of the various clusters is still low or at an early stage. The related and supporting industry factors that do not assist the competitiveness of the palm oil comes from fatty acid with fatty alcohol industry in Indonesia are the limited number of local suppliers in terms of both quantity and capability, especially for machinery and engine parts, research and development, institutions which are still limited in terms of the number, capacity, capability, and level of collaboration, development of oil palm industry clusters and their derivatives are still at a low level, especially in terms of policy implementation, coordination between stakeholder institutions, and collaboration within clusters.

**Government**

Factors related to the government that assist to the palm oil-based industry of fatty acid and fatty alcohol in Indonesia are export duty (BK) policies that assist the development of the downstream palm oil industry, competition, law is improving, but its implementation remains problematic, political system and government are quite stable, and policy macro-economy which is generally quite supportive of the industries. The factors related to the government that do not assist the competitiveness industry from the palm oil based fatty acid and alcohol are tax allowance facilities and new tax holidays given only to certain investment level, a comprehensive national industrial policy does not yet well exist, the

upstream industry is not integrated with downstream industry, public services are still sluggish, bureaucratic, and less professional, corruption, bureaucracy, and double taxes, and weak protection of investors.

**Chance**

Factors related to chance that assist the competitiveness due to industry fromthe palm oil-based fatty acid and fatty alcohol in Indonesia are continuous research and development (R&D) of new application products for fatty acids and fatty alcohols, high oil price causes high petrochemical price (substitution of fatty alcohols), biodiesel policy in America and Europe tends to be protective of their domestic industries, and the depreciation of the Rupiah against the US dollar caused export revenues in Rupiah to increase.(Hanitha et al., 2022) The factors related to chance that do not assist the competitiveness of this industry in Indonesia are the depreciation of the Rupiah against the US dollar causing import expenditures in Rupiah to increase and the existence of international trade barriers, both tariff and non-tariff, namely related to environmental issues.

## CONCLUSION

The competitiveness strategy for the palm oil-based fatty acid and fatty alcohol industry in Indonesia is defined by six factors, there are conditions, demand, strategy of firm, rivalry, and structure, supported and related industries, government factors, and chance. Therefore, each factor consists by several sub-factors, which are interacting, interrelating, and influencing with each other. The results of this study show that based on the model of competitiveness for the industry, there are some sub-factors with ”good” condition status and other sub-factors with condition ”bad” status. The condition of ”bad” sub-factors are apparently weaknesses and must be improved soonest.

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