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The Effect of Comparative Advantage and Competitive Advantage to Improve Indonesia's Essential Oil Export Performance in the International Market

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ABSTRACT: This study investigates the impact of comparative and competitive advantages on Indonesia’s essential oils export performance in international markets. The analysis employs the Revealed Comparative Advantage (RCA) method to evaluate comparative strength and utilizes the Economic Complexity Index (ECI) to gauge competitive positioning. Using a quantitative explanatory approach, the research draws on secondary data from five major Asian trading partners—India, China, Japan, South Korea, and Malaysia—spanning the years 2019 to 2023. The findings indicate that RCA values have shown considerable volatility, with notable comparative advantages observed only during 2020 and 2021. In contrast, ECI values have declined sharply, entering negative territory in recent years, reflecting limited product sophistication and low value-added in Indonesia’s essential oils exports. The fluctuating RCA values reveal underlying structural challenges and difficulty in sustaining long-term competitiveness. The pronounced ECI decline highlights shortcomings in downstream processing, innovation gaps, and a dependence on exporting raw or minimally refined products. These factors hinder Indonesia’s ability to compete with nations like Japan and China, which excel through innovation-driven, advanced production systems. To improve its standing in the global market, Indonesia must implement integrated strategies that enhance product quality, promote value-added manufacturing, and tap into emerging export markets. Equally vital is fostering synergy between government, industry stakeholders, and the private sector to encourage innovation, strengthen SMEs, and modernize export infrastructure. Such collaborative efforts are key to developing a resilient and globally competitive essential oils sector capable of sustainable growth.

KEYWORDS: Indonesia Essential Oils, Comparative Advantage, Economic Complexity, Value-Added Exports, Export Performance

INTRODUCTION

As a country with great agricultural potential, Indonesia has long relied on the agricultural sector as the backbone of its economy. Around 40% of Indonesia's population depends on this sector, making it one of the main pillars supporting the national economy. One of the important subsectors in Indonesian agriculture is plantations, which contribute significantly to the Gross Domestic Product (GDP). In 2022, the agriculture, forestry and fisheries sector contributed around 12.4% to Indonesia's GDP (Statistics Indonesia, 2022).

One agricultural commodity that plays an important role in Indonesia's international trade is essential oils. These products, derived from aromatic plants such as patchouli, citronella, and cloves, have a variety of applications in the global industry from perfumes to pharmaceuticals. Essential oils have a very wide range of functions, from use in cosmetic products, medicines, to flavoring ingredients in the food and beverage industry (Osaka, 2020). Indonesia, with a tropical climate that supports the growth of aromatic plants, is one of the major producers of essential oils in the world.

However, despite Indonesia's great potential in the essential oil sector, global competition is intensifying. Recent data shows that India, China, and Japan are the major players in the essential oil export market. In 2023, Indonesia recorded an essential oil export value of USD 175,069 million, with the main markets being in the Asian region (Comtrade.un, 2024). Nonetheless, Indonesia faces challenges in maintaining this position, mainly due to price fluctuations and evolving market demands. Therefore, it is important to analyze the factors that affect Indonesia's competitiveness in essential oil exports, so that the country can be more competitive in the international market.

Comparative competitiveness and competitive competitiveness are two main approaches in economic analysis and business strategy that have different characteristics. Comparative competitiveness refers to the ability of a country to produce goods or services at a lower opportunity cost than other countries, which is generally due to natural factors such as resource endowment, geographical conditions, and production cost structure. This concept tends to be fixed and originates from the classical economic theory proposed by David Ricardo. Competitive competitiveness, on the other hand, refers to advantages formed through strategic processes such as innovation, efficiency improvement, technology development, and management of product quality and brand. These advantages are flexible and can be enhanced through appropriate policies and investments. Thus, understanding these two concepts is very important in designing adaptive economic policies and in determining the direction of development of strategic sectors in the midst of global market dynamics.

One way to assess the competitiveness of a commodity is through the *Revealed Comparative Advantage* (RCA) and *Economic Complexity Index* (ECI) indicators. RCA measures a country's comparative advantage in international trade by comparing a country's export market share to the global export market share. The higher the RCA value, the greater a country's competitiveness in that sector. Meanwhile, ECI measures a country's economic complexity by looking at the structure of exported products, where the more complex a product is, the higher the level of skill and technology required to produce it (Hausmann & Hidalgo, 2009).

Through these two indicators, this study aims to provide a deeper understanding of Indonesia's position in the global essential oil trade. Although Indonesia has great potential, there are still many challenges to be faced, especially in terms of product quality, market diversification, and technology that supports essential oil production. Therefore, this study will examine Indonesia's export performance and the competitiveness of the sector to identify strategic steps that can be taken to strengthen Indonesia's position in the international market.

LITERATURE REVIEW

International Trade Law

Rafiqul Islam defines this law as "a collection of rules, principles, norms and practices that create an arrangement for transnational trade transactions". Trade liberalization aims to open access to trade without barriers by reducing various trade barriers both tariff and non-tariff (Purwana, 2019). International trade provides wider market access for Indonesian products, increases foreign investment, and supports economic diversification (Putra & Sudirman, 2014). The basic theory put forward by Heckscher-Ohlin is that trade is formed from the differences in production factors of each country, namely one country is able to specialize and can produce a larger amount of goods while the other country has limitations, resulting in transactions between the two countries (Morrow, 2010). Wibowo (2024) defines international trade as trade in goods and services carried out through export and import activities both on a small and large scale carried out with at least two countries based on agreements between individuals, agreements between individuals and governments or agreements between the governments of two countries. Adam Smith (1776) stated that a country has an absolute advantage in producing goods if it can produce them more efficiently than other countries.

Competitiveness Concept

The concept of competitiveness plays a crucial role in determining the strategic position of a country or company in the global market. According to Michael E. Porter (1990), competitive advantage is not solely determined by the low cost of production or the availability of natural resources, but by the capacity to create added value through continuous innovation, efficiency improvement, and productivity. Michael E. Porter introduced the *diamond model*, which explains that competitiveness is influenced by four main elements, namely the condition of production factors, the characteristics of domestic demand, related and supporting industries, as well as the strategy, structure, and competition between companies. Meanwhile, the *World Economic Forum* (WEF) defines competitiveness as a combination of institutions, policies, and structural factors that determine a country's level of productivity, including aspects such as infrastructure, education systems, innovative capabilities, market efficiency, and technological readiness. The Organization for Economic Cooperation and Development (OECD) also states that competitiveness indicates the ability of a country or business entity to provide products and services that are able to meet global market demands, while improving people's welfare in the long term. In the Indonesian context, the Indonesian Ministry of Trade (2020) defines competitiveness as the ability to produce products that are not only competitive in terms of price and quality, but also able to sustainably survive in the global market. In line with this, Man and Wafa (2010) emphasize that competitiveness reflects the capacity to optimize comparative and competitive advantages through operational efficiency, innovation, and differentiation strategies. Therefore, competitiveness is seen as a complex and comprehensive concept, which must be managed strategically to strengthen its position in international trade.

Comparative Competitiveness

Comparative competitiveness is a key principle in international trade theory that refers to a country's ability to produce and export goods or services at a lower opportunity cost than other countries. This idea was first introduced by David Ricardo in 1817, who stated that trade between countries remains profitable even if a country is superior in all production, as long as the country focuses on commodities with the highest relative advantage. Later, Balassa (1965) introduced the *Revealed Comparative Advantage* (RCA) index as a quantitative method to identify comparative advantage based on actual export data. If the RCA value exceeds one, then the product is considered to have a comparative advantage in the global market. Krugman and Obstfeld (2009) added that comparative advantage supports efficiency on a global scale because it encourages specialization and optimal resource utilization. Furthermore, Porter (1990) enriched this concept with the theory of national competitive advantage, which emphasizes the importance of innovation, productivity, and industrial structure and strategy in strengthening long-term competitiveness. Todaro and Smith (2015) also emphasize that proper management of comparative advantage can promote economic growth, especially in developing countries. Therefore, in the context of Indonesia's essential oil exports, analyzing comparative competitiveness is very important to understand Indonesia's position and opportunities in the international market.

Competitive Competitiveness

Competitive competitiveness is a crucial concept in economic studies and managerial strategy that describes the ability of a country or company to maintain a superior position in the global market. Michael E. Porter (1990) explains that competitiveness does not solely depend on aspects of production costs or natural resources, but is determined by the capacity to innovate, improve efficiency, and produce added value consistently. He developed a *diamond model* consisting of four main elements as determinants of competitiveness, namely the condition of production factors, domestic demand, supporting and related industries, and corporate structure and competition. Meanwhile, Barney (1991) argues that competitive advantage will be achieved if an entity has resources that are valuable, rare, difficult to imitate, and not easily replaced by the concept known as VRIN. In this framework, competitive advantage is adaptive and rooted in unique strategies and internal assets. Kotler and Keller (2012) also stated that competitive competitiveness reflects the ability of organizations or countries to create differentiation, cost efficiency, and responsiveness to the dynamics of market needs. On the other hand, the *World Economic Forum* (WEF), through its annual *Global Competitiveness Report*, assesses competitiveness as a combination of institutions, policies, and structural factors that affect long-term productivity, including the quality of education, infrastructure, efficient markets, and technological readiness. Fagerberg (1988) added that a country's competitiveness can be seen from its ability to maintain and increase its global market share through excellence in quality, innovation, and production efficiency. Therefore, based on these various views, it can be emphasized that competitive competitiveness is a strategic element that needs to be managed thoroughly to encourage the increase of national exports, especially in the development of Indonesian essential oil exports.

Export Performance

Export performance related to the level of competitiveness of a country can be seen from comparative advantage and competitive advantage (Aji et al., 2017). Commodities with a high level of stability of comparative and competitive advantages have the potential and ease of increasing productivity to achieve a good level of competitiveness (Kuswantoro & Rosianawati, 2016). The increase or decrease in a country's export performance is influenced by three factors that need to be considered to serve as a strength in international trade. A country's export performance from the demand side is determined by market distribution factors and commodity composition factors. The commodity composition factor explains that a country needs to pay attention to commodities that have high demand in determining its commodity specialization. In addition, it is also necessary to pay attention to market distribution factors or which regions are experiencing an increase or decrease in demand.

RESEARCH METHODOLOGY

This research uses a quantitative method with an explanatory approach, which is an approach that aims to explain causal or causal relationships between variables in a systematic and measurable manner. According to Sugiyono (2019), an explanatory quantitative approach is used to test hypotheses and explain the effect of independent variables on the dependent variable using numerical data and statistical analysis. In addition, Creswell (2014) explains that explanatory research is conducted to identify the causes of a particular symptom by utilizing hypothesis testing and inferential statistical techniques. This approach is considered appropriate because it is able to answer the formulation of research problems empirically.

In the context of this study, the explanatory approach is used to examine the effect of comparative competitiveness (measured through *Revealed Comparative Advantage/RCA*) and competitive competitiveness (measured using *Economic*

Complexity Index/ECI) on Indonesia's essential oil export performance in the international market. As stated by Bungin (2011), explanatory research aims to explain the relationship between variables and seek empirical evidence for the alleged influence between one variable and another through statistical analysis.

Variable Measurement

In this study, variables are important elements used to measure and analyze the relationship between the concepts studied. This research focuses on the influence of two independent variables on one dependent variable, all of which are closely related to the issue of competitiveness and export performance of Indonesian essential oils at the global level.

1. Independent Variable (X1): Comparative *Advantage* is identified using the *Revealed Comparative Advantage* (RCA) method.
2. Independent Variable (X2): *Competitive Advantage* is determined through *Economic Complexity Index* (ECI).
3. Dependent Variable (Y): *Export Performance* is assessed based on export trends, market share, and other performance indicators on Indonesian essential oil exports.

RESEARCH RESULTS AND DISCUSSION

Result

This study analyzes the effect of comparative advantage and competitive advantage on Indonesia's essential oil export performance in the global market. The two main indicators used in this analysis are the Revealed Comparative Advantage (RCA) and the Export Competitiveness Index (ECI), with data coverage from five of Indonesia's main partner countries in Asia, namely India, China, Japan, South Korea, and Malaysia during the period 2019 to 2023.

Table I Indonesia's Essential Oil RCA Value (2019-2023)

Year	India	China	Japan	South Korea	Malaysia
2019	0,65	5,53	7,72	3,18	4,86
2020	1,17	6,01	7,21	5,62	5,29
2021	1,27	3,54	9,28	6,29	2,53
2022	0,63	2,94	5,85	3,13	1,03
2023	0,88	3,21	6,73	5,54	1,26
Average	0,92	4,24	7,36	4,75	2,99

Source: UN Comtrade and Trademap, (data processed)

The results of the RCA analysis show that Indonesia's comparative competitiveness has not been fully consistent from year to year. Indonesia's RCA value only exceeds 1 in 2020 and 2021, which means that the advantage is temporary. On the other hand, Japan has consistently recorded the highest RCA value with an average of 7.36, which emphasizes its strategic position in the world essential oil export market. Other countries such as China and South Korea also show fairly stable competitiveness.

Table II ECI Value of Indonesian Essential Oil Exports (2019-2023)

Year	ECI Value
2019	1.00
2020	5.33
2021	97.48
2022	-3.02

2023	-187.95

Source: UN Comtrade, (data processed)

In terms of competitive competitiveness, Indonesia's ECI value has experienced a notable downward trend. In 2021, Indonesia had reached the highest ECI of 97.48. However, this figure dropped dramatically to enter the negative zone in 2022 and 2023. This decline reflects Indonesia's declining export market share in the global essential oil industry, which can be interpreted as an indication of Indonesia's weakening competitive position in the international market.

DISCUSSION

The findings of the RCA approach show that Indonesia's comparative advantage in essential oil exports is still fluctuating and unsustainable. Although it had shown superiority in 2020 and 2021, this achievement could not be maintained. This indicates that Indonesia still faces challenges in building a solid and highly competitive export structure. When compared to competitor countries such as Japan and China, Indonesia is still lagging behind in terms of the stability and strength of its export structure.

On the other hand, the decline in ECI over the past five years provides a strong signal that the complexity of Indonesia's export products is still low. Indonesia's essential oil exports are generally still in the form of raw or semi-finished materials, thus lacking high added value. This condition is certainly an obstacle in improving competitive competitiveness, especially when the global market increasingly demands quality products with high innovation. The performance of countries such as Japan and China, which continue to excel in RCA values and are supported by better economic complexity, shows that success in exports is not only determined by natural resources, but also by factors of industrial strategy, innovation, technology, and production efficiency. Indonesia still needs to improve in these aspects in order to compete more strongly in the export market.

Furthermore, the negative ECI value in the last two years may reflect the lack of downstream efforts and product innovation in the domestic essential oil industry. The lack of utilization of modern technology, limited access to international markets, and weak research and export policy support are serious challenges that need to be addressed immediately. Therefore, improving Indonesia's essential oil export competitiveness requires comprehensive interventions, including strengthening industrial policies, fostering MSMEs, and providing adequate production and export facilities. In addition, market expansion to non-traditional countries, improving product quality, and implementing international standards are strategic steps that can help improve Indonesia's position in the global value chain.

CONCLUSION

1. The RCA analysis revealed that Indonesia was only able to maintain its comparative advantage in essential oil exports for two years out of the five-year period studied. This suggests that the advantage is temporary and not yet supported by a solid industrial foundation.
2. Indonesia's ECI index experienced a sharp decline, even reaching negative values in 2022 and 2023. This condition indicates the weakening of Indonesia's position in the global essential oil market due to the lack of innovation, low value- added products, and underdeveloped export complexity.
3. The low value-added of export products is a major obstacle in efforts to increase competitiveness. The limitations of the downstream process and the lack of product innovation have made Indonesia unable to compete with other countries that have successfully developed essential oil derivative products.
4. Efforts to strengthen essential oil exports need to be made through improving product quality, product and market diversification, and policies that support the development of technology and innovation. Collaboration between the government, industrial sector, and local businesses is a key factor in creating sustainable competitiveness.

LIMITATION AND FUTURE RESEARCH

This study has several limitations that need to be considered. First, the data used only covers the last five years (2019-2023) and is limited to five trading partner countries in Asia, so it cannot fully illustrate the position of Indonesia's essential oil export competitiveness in the global market. In addition, the use of the RCA and ECI methods does help in looking at competitiveness, but has not considered other factors such as policy support, infrastructure readiness, and domestic industry conditions that can also affect export performance.

For the future, research can be conducted with a wider scope, both in terms of time, region, and variables used. For example, adding partner countries outside Asia and considering other aspects such as innovation, technology utilization, and the role of the government in industrial development. The research can also be complemented with qualitative methods such as interviews with business actors or case studies, so that the results are more in-depth and can be input for efforts to increase the competitiveness of Indonesia's essential oil exports in a sustainable manne

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