International Journal of Economics and Management Research

E-ISSN: 2830-2508
P-ISSN: 2830-2664

Research Article

Analysis of the Competitiveness and Export Performance of Indonesian Coconut Shell Charcoal Briquettes (HS 4402) in Saudi Arabia : RCA, EPD, and XModel

Mochamad Rayhan Faujan[1], Arief Bacthtiar[2*]

[1] Universitas Pembangunan Nasional Veteran Jawa Timur; email : rayhanfaujaan13@gmail.com
[2] Universitas Pembangunan Nasional Veteran Jawa Timur; email : ariefbachtiar@upnjatim.ac.id
* Corresponding Author : ariefbachtiar@upnjatim.ac.id

Abstract: Coconut shell charcoal briquettes are one of Indonesia's leading export commodities with high demand in international markets, including Saudi Arabia. Although Indonesia remains the top exporter, export growth over the past decade has faced increasing competition from countries such as China, Malaysia, Vietnam, and Egypt. This study aims to analyze the competitiveness, export performance dynamics, and market potential of Indonesia's coconut shell charcoal briquettes compared to its four main competitors in the Saudi Arabian market from 2014 to 2023. The methods employed include the Revealed Comparative Advantage (RCA) to measure comparative advantage, Export Product Dynamic (EPD) to assess export performance trends, and the XModel Potential Export Products to evaluate market potential. The RCA results indicate that Indonesia has a very strong comparative advantage (average RCA of 49.49), consistently surpassing its competitors. However, EPD analysis categorizes Indonesia as a "Lost opportunity," meaning that while exports are growing, market share is declining, indicating untapped potential. The XModel analysis positions Indonesia as a "Potential Market," while Vietnam emerges as the only "Optimistic Market" with a strong RCA (13.97) and a Rising star EPD trend. These findings highlight Indonesia's strong comparative advantage but emphasize the need for adaptive export strategies to convert potential into sustainable competitiveness.

Keywords: Charcoal Briquettes; Competitiveness; EPD; Market Potential; RCA.

1. Introduction

International trade plays a fundamental role in global economic development, particularly for developing nations that rely on trade relations to strengthen their national economies. Amidst limitations in resources and production capacity, international trade serves as a solution to meet increasing domestic demand (Anjamaniz & Yulistia, 2024). As a developing nation, Indonesia adopts a small open economy system, actively engaging in exports ranging from raw materials to finished goods to enhance national income and solidify its position in the global market. However, Indonesia does not act as a price setter; consequently, it must adapt to the demand and supply mechanisms of the international market. This condition places Indonesia, despite being a primary exporter of charcoal briquettes to Saudi Arabia, in a vulnerable position regarding competition from other countries such as China, Malaysia, Vietnam, and Egypt, which possess production efficiencies and more aggressive trade strategies.

The five aforementioned countries are the primary producers and exporters of coconut shell charcoal briquettes in the global market. Although Indonesia currently holds the top position as an exporter to Saudi Arabia, this dominance does not fully guarantee the future sustainability of its standing. In line with the dynamics of international trade, China and

Received: 16 July 2025
Revised: September 20, 2025
Accepted: December 18, 2025
Online Available: January 24,2026
Curr. Ver.: January 24, 2026

Vietnam have demonstrated significant year-over-year export growth and possess the potential to rival, or even displace, Indonesia's position. This situation underscores that Indonesia, as a country characterized by a small open economy, must continuously strengthen its competitiveness through increased production efficiency, industrial technological innovation, and the enhancement of international cooperation to maintain its competitive advantage amidst increasingly dynamic global competition, particularly in key markets such as Saudi Arabia.

Indonesia possesses abundant natural resource wealth and a strategic geographical position. The country's forest area reaches 125,795,306 hectares (Balqis & Yanuar, 2021), reflecting the vast potential of forest products and their role in global trade. One of the leading commodities based on these natural resources is coconut, with Indonesia recognized as one of the largest coconut producers in the world. Coconut plantations are widely distributed across various regions such as Sulawesi, Sumatra, and Java, particularly in coastal areas (Dewi Mahrani Rangkuty et al., 2024), and they yield a variety of high-value economic derivatives, including coconut oil, copra, coconut milk, and coconut shells.

Coconut shells are subsequently processed into charcoal briquettes, which represent one of the leading products with high demand in the international market. The environmentally friendly characteristics and efficiency of coconut shell charcoal briquettes as an alternative energy source have driven an increase in global demand. Along with the rising awareness of renewable energy, the coconut shell charcoal briquette industry has experienced significant growth, supported by increased investment and exports. This positive trend is reflected in Indonesia's export data for coconut shell charcoal briquettes in recent years, which simultaneously creates economic opportunities and supports sustainable development goals.

Table 1. Indonesian Coconut Shell Charcoal Briquette Exports 20142023.

Tahun	*Export Values (*USD*)*	*Quantity (T*on*)*
2014	156.524	326.867
2015	185.283	456.510
2016	190.555	370.923
2017	241.267	444.341
2018	297.801	544.134
2019	280.104	527.130
2020	272.200	483.168
2021	291.961	467.041
2022	360.325	527.514
2023	388.975	634.991

Sumber : TradeMap (2024), diolah

The data illustrate the development of Indonesia's coconut shell charcoal briquette exports over a tenyear period. The highest export value was recorded in 2023, amounting to USD 388,975 with an export volume of 634,991 tons. A decline in export value occurred in 2019 and 2020, reaching USD 17,697 and USD 7,904 respectively, while export volumes remained relatively stable. This condition indicates price adjustments in the international market rather than a contraction in export capacity. The decline was closely associated with disruptions in global trade caused by the COVID19 pandemic, which affected export activities through social restrictions and lockdown policies implemented in many countries.

Since 2021, export values have shown a consistent upward trend and reached their peak in 2023, reflecting the recovery of the global economy and the increasing international demand for Indonesian coconut shell charcoal briquettes. This product is classified under the Harmonized System (HS) Code 4402, namely wood charcoal, which includes charcoal derived from coconut shells (Elpawati et al., 2024) Coconut shells, which were previously regarded as waste, have now been utilized as a high–value raw material, contributing to increased income for producers and expanding export markets across Asia, Europe, the Americas, and the Middle East. Coconut shell charcoal briquettes represent one of Indonesia's export commodities

with strong international demand (Phung & Wikartika, 2024) and play a significant role in promoting sustainable waste management practices.

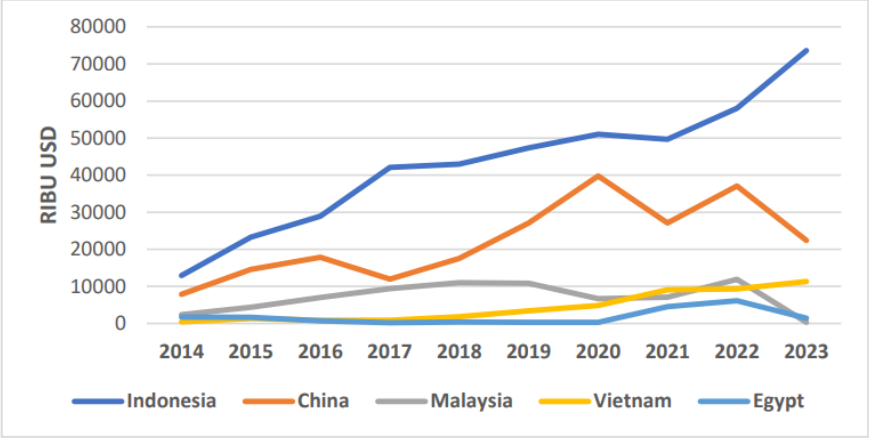

Figure 1. Coconut Shell Charcoal Briquette Exporting Countries (HS 4402) to the Saudi Arabian Market 20142023.
Source : International Trade Centre (2024)

The data indicate that Indonesia demonstrates the strongest performance in the coconut shell charcoal briquette industry, with export values reaching USD 73,610 thousand in 2023 and exhibiting a consistently positive growth trend. This performance confirms Indonesia's position as a global market leader in this sector. In contrast, China, which previously recorded relatively stable export levels, has experienced a significant decline in recent years, with export values falling to USD 22,396 thousand in 2023. Meanwhile, Vietnam has shown positive and increasingly competitive growth, as reflected in the rise of its export value to USD 11,317 thousand in 2023, particularly in the Saudi Arabian market.

At the same time, Malaysia and Egypt have experienced substantial declines in export performance, with export values of USD 316 thousand and USD 1,454 thousand respectively in 2023. These trends indicate a weakening of competitiveness and highlight the structural challenges faced by both countries in responding to the increasingly competitive dynamics of global trade, especially in strategic markets such as Saudi Arabia.

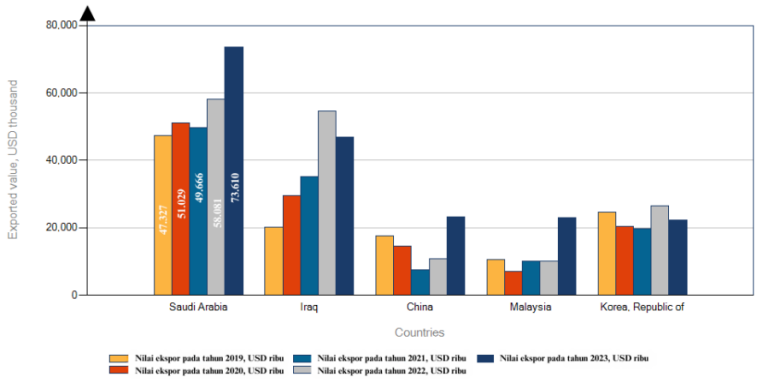

Figure 2. Indonesia's Coconut Shell Charcoal Briquette Importing Countries (HS 4402) 20192023
Source : Directorate General of Fiscal Balance

Saudi Arabia represents one of the priority export markets for Indonesia's coconut shell charcoal briquettes, as evidenced by the increasing trend of coconut charcoal and derivative product imports in the country. In 2019, the value of Indonesia's coconut charcoal exports to Saudi Arabia reached USD 47,327 thousand, while Saudi Arabia's total imports of the same product from all countries amounted to USD 83,702 thousand. This figure indicates that Indonesia accounted for approximately 56% of the Saudi Arabian market share for coconut shell charcoal briquettes (Kementerian Keuangan, 2022)

This study identifies several research gaps that contribute to the advancement of export competitiveness analysis for coconut shell charcoal briquettes (HS 4402) from Indonesia and competing countries in the Saudi Arabian market over the period 2014–2023. From a methodological perspective, this research incorporates the XModel as an additional comparative analytical tool, rather than relying solely on Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD), as commonly applied in previous studies (Kementerian Lingkungan Hidup dan Kehutanan, 2023), (Nasution et al., 2022). The X-Model offers a more comprehensive framework for assessing export competitiveness by integrating comparative advantage with market dynamics in an increasingly volatile global trade environment.

In terms of research scope, this study specifically focuses on the Saudi Arabian market and coconut shell charcoal briquettes classified under HS 4402. Most previous studies have examined coconut charcoal exports in general without concentrating on a specific destination market (Putri & Hidayat, 2023)(Rahman Tsani et al., 2022). Although some research has addressed the Saudi Arabian market (Milhatu Rojaba, 2023), the analysis has largely been limited to wood charcoal products and has not explicitly focused on charcoal briquettes (HS 4402).

In addition, the competition analysis gap constitutes an important issue in the existing literature. Although Indonesia is widely recognized as a leading exporter of coconut shell charcoal briquettes, studies that systematically compare Indonesia's export competitiveness with that of major competing countries such as China, Malaysia, Vietnam, and Egypt in the Saudi Arabian market remain limited (Septian Wulandari, 2021). Therefore, by integrating Revealed Comparative Advantage (RCA), Export Product Dynamics (EPD), and the XModel, this study is expected to provide a more comprehensive and nuanced understanding of the factors influencing Indonesia's export competitiveness in the face of intensifying global competition in the Saudi Arabian market.

2. Literature Review

International Trade Theory

International trade plays a crucial role for developing countries, including Indonesia. Through crossborder trade, countries can obtain various benefits, both direct and indirect. One of the direct benefits arises from specialization, whereby a country exports commodities it produces efficiently and exchanges them for goods produced by other countries at lower costs. This process directly increases national income, which in turn stimulates higher output levels and supports overall economic growth (Ulfah et al., 2023).

Indirect benefits of international trade include the ability to exchange goods with relatively low growth potential for imported goods that offer higher growth prospects. Moreover, international trade serves as a channel for the transfer of new ideas, expertise, and skills that can foster technological progress. It also provides the foundation for the flow of foreign capital, as international trade facilitates capital movements from developed to developing countries. Without international trade, such capital inflows would be highly constrained. All international trade activities within a country are recorded in the trade balance, which comprises exports and imports of goods and services (Yuliana Maria Dwi PB, 2017).

Exports play a vital role in modern economies by expanding market access for individuals and firms to sell their products internationally. As a major source of national income, exports are particularly important for countries with open economic systems. Expanding export activities across global markets can increase production capacity, which ultimately accelerates economic growth. Therefore, exports are expected to generate significant positive impacts on a country's economic development and stability.

Related Work

Balqis & Yanuar, (2021)(Aresta Putri et al., 2024) found that Indonesia possesses a strong comparative advantage in coconut charcoal exports to European markets particularly Germany, the Netherlands, France, Italy, and Belgium based on the Revealed Comparative Advantage (RCA) index. However, the Export Product Dynamics (EPD) analysis reveals considerable variation in competitiveness across destination countries, with Indonesia positioned as retreat in the Netherlands, Germany, and Belgium; rising star in Italy; falling star in France; and lost opportunity in the United States. In addition, the Trade Specialization Index (TSI) confirms Indonesia's strong export competitiveness, with an average value of 0.95 per year. (Elpawati et al., 2024) reported that the charcoal market in Saudi Arabia is oligopolistic

and dominated by Indonesia and China. Indonesia acts as the leading supplier, accounting for a market share of 53.51% and demonstrating a strong comparative advantage. Besides Indonesia and China, Malaysia and Vietnam also exhibit dynamic export performance and are classified as rising stars, reflecting increasing competitiveness and significant export growth during the 2014–2022 period.

(UNCTAD, 2020) demonstrated that Indonesia's export competitiveness in natural rubber within the ASEAN5 market varies across countries. Indonesia shows strong competitiveness in Singapore, but relatively weak performance in Malaysia, Thailand, the Philippines, and Vietnam. Cluster analysis indicates that although competitiveness in Thailand remains low, the market is categorized as a rising star, suggesting potential for future development. Singapore exhibits strong competitiveness but limited market potential, while the Philippines is positioned as a falling star. Malaysia and Vietnam are assessed as nonpotential destinations for Indonesian rubber exports. Meanwhile, (Suhardi & Afrizal, 2021) identified Malaysia, Canada, the Netherlands, Brazil, the United States, and the Dominican Republic as optimistic markets for export development, while the United Arab Emirates, Germany, and Algeria were classified as potential markets worthy of strategic focus.

(Aresta Putri et al., 2024) found significant differences in the comparative competitiveness of Indonesian pepper exports in the United States, India, Korea, and France. Panel data analysis indicates that per capita GDP of the destination country, population size, and export prices significantly influence the volume of Indonesian pepper exports. In contrast, export prices and the exchange rate of the Vietnamese dong against the US dollar were found to significantly affect Vietnam's pepper export volume.

Finally, (Septian Wulandari, 2021) showed that both Indonesia and Australia possess strong competitiveness in exporting coal derivative products. Nevertheless, Australia demonstrates more optimistic market prospects across a broader range of Asian countries compared to Indonesia.

Overall, previous studies indicate that Indonesia's export competitiveness varies across commodities and destination markets. Indonesia often demonstrates a strong comparative advantage; however, this advantage is not always accompanied by stable or sustained export performance. Various analytical approaches such as Revealed Comparative Advantage (RCA), Export Product Dynamics (EPD), Trade Specialization Index (TSI), cluster analysis, and panel data models reveal that Indonesia's export position may fall into different categories, including rising star, falling star, retreat, or lost opportunity, depending on market characteristics and the dynamics of global demand. Macroeconomic factors in destination countries, including GDP per capita, population size, export prices, and exchange rates, have been shown to significantly influence export volumes and competitiveness. Moreover, competition with other exporting countries such as China, Vietnam, Malaysia, Australia, and other ASEAN members suggests that Indonesia's dominance in certain markets continues to face challenges from competitors with more dynamic export growth or more optimistic market prospects. Nevertheless, much of the existing literature still examines commodities or markets in a broad context, implying that studies focusing on comparative competitiveness across competing countries within a specific target market remain relatively limited.

3. Proposed Method

This study analyzes export performance to evaluate the competitiveness of Indonesia's coconut shell charcoal briquettes (HS 4402) and those of competing countries in the Saudi Arabian market over the period 2014–2023. The analytical tools employed include Revealed Comparative Advantage (RCA) to measure comparative advantage, Export Product Dynamics (EPD) to assess market dynamics and product positioning in international trade, and the X-Model of Potential Export Products, which integrates RCA and EPD to classify market potential. This integrated approach enables a comprehensive identification of Indonesia's competitive position while allowing systematic comparisons with major competitor countries in the context of evolving global trade dynamics.

The formula used to calculate the RCA index is presented as follows:

$$\boldsymbol{RCA = \frac{Xij/Xin}{Xrj/Xrn}}$$

Xij : The export value of Indonesian coconut shell charcoal briquettes to other countries j
Xin : Total export value of all commodities from country i to country j
Xrj : The total value of world coconut shell charcoal briquette exports to the country j
Xrn : Total value of exports of all world commodities to country j

The formula used to calculate the EDP index is presented as follows:

Export Market Share Growth (X):

$$X = \frac{\sum_{t=1}^{t}\left(\frac{Xij}{Wij}\right)t \times 100\% - \sum_{t=1}^{t}\left(\frac{Xij}{Wij}\right)t-1 \times 100\%}{T}$$

Product Market Share Growth (Y):

$$Y = \frac{\sum_{t=1}^{t}\left(\frac{Xt}{Wt}\right)t \times 100\% - \sum_{t=1}^{t}\left(\frac{Xt}{Wt}\right)t-1 \times 100\%}{T}$$

Xij : Export value of coconut shell charcoal briquettes to destination countries (US$)
Wij : The world's export value of coconut shell charcoal briquettes to destination countries (US$)
Xt : Total value of exports of all commodities from country i to destination country (US$)
Wt : Total value of exports of all world commodities to destination countries (US$)
T : Number of Years (10 years)
T : Year t (2014, 2015, 2016,…,2023)

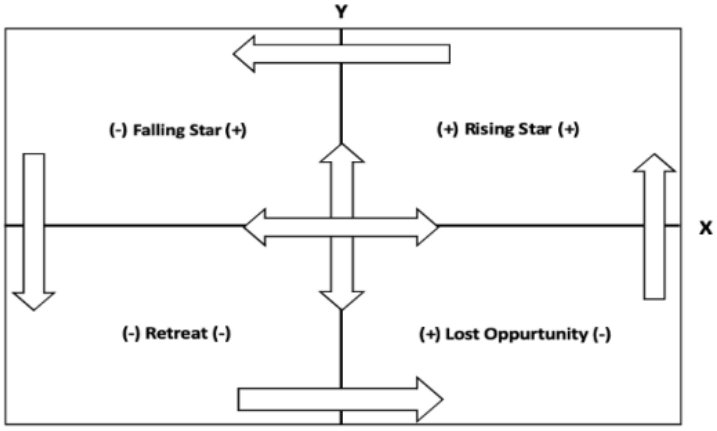

Figure 3. Product Competitive Position with EPD Method.
Source : Tarman etc, 2011

The EPD matrix consists of two main components: market attractiveness (X-axis), which reflects the growth of product demand in the destination market, and business strength (Y-axis), which represents the growth of a country's market share. The interaction between these two dimensions is used to classify a product's position into four categories: *rising star*, *falling star*, *lost opportunity*, and *retreat* (Rosita, 2017). The *rising star* category indicates simultaneous growth in demand and export market share; *lost opportunity* reflects a decline in export market share despite increasing market demand; *falling star* denotes an increase in export market share amid declining global demand; while *retreat* signifies a simultaneous decline in both export market share and market demand.

The X-Model of Potential Export Products is applied to assess the competitiveness of coconut shell charcoal briquettes from Indonesia, China, Malaysia, Vietnam, and Egypt in the Saudi Arabian market over a ten-year period. This method integrates Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD) to classify export potential and to support the formulation of more targeted strategies for enhancing export competitiveness.

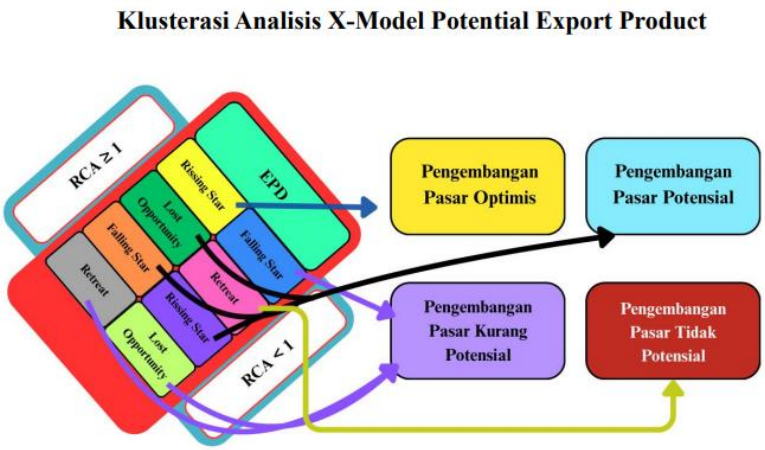

Figure 4. Klusterasi Analisis XModel Potential Export Product.
Source : Ministry of Trade

The X-Model classification provides a strategic framework for assessing a commodity's competitive position based on the combined outcomes of RCA and EPD. An *optimistic market* is characterized by an RCA value greater than one (RCA > 1) and an EPD position classified as a *rising star*. A *potential market* refers to conditions in which RCA > 1 with EPD categorized as *falling star* or *lost opportunity*, or RCA < 1 with EPD in the *rising star* position. A market is considered *less potential* when RCA > 1 is accompanied by EPD positions of *retreat*, *falling star*, or *lost opportunity*. Finally, a *non-potential market* is identified when RCA < 1 and EPD falls into the *retreat* category. This classification serves as a basis for determining market development priorities and for formulating more effective export strategies.

4. Results and Discussion

Results of the Revealed Comparative Advantage (RCA) Analysis of Coconut Charcoal Briquettes (HS 4402) in the Saudi Arabian Market

The results of the Revealed Comparative Advantage (RCA) calculations for the period 2014–2023 indicate that Indonesia's coconut shell charcoal commodity exhibits a clear comparative advantage, as reflected by RCA values consistently greater than one (RCA > 1). This condition suggests that Indonesia is able to produce and export coconut shell charcoal more efficiently than the global average and competing countries, thereby reinforcing its strong competitive position in international markets.

Table 2. RCA Results of Coconut Shell Charcoal Briquette Exports from Exporting Countries to Saudi Arabia 20142023.

Year	Country				
	Indonesia	China	Malaysia	Vietnam	Mesir
2014	34,86	2,22	11,95	4,74	5,07
2015	38,79	2,31	17,07	8,39	2,83
2016	47,72	2,04	18,85	4,68	0,83
2017	55,17	1,18	17,25	3,63	0,24
2018	60,90	1,73	20,39	9,59	0,46
2019	54,29	1,96	22,01	16,89	0,35
2020	61,09	2,27	10,89	17,63	0,24
2021	49,36	1,40	9,13	38,52	3,20
2022	37,49	1,27	9,36	16,98	3,17
2023	55,20	0,81	0,33	18,62	0,85

Average	49,488	1,719	13,723	13,967	1,724

Source : Data processed

The RCA data for coconut shell charcoal briquettes (HS 4402) over the 2014–2023 period indicate that Indonesia consistently occupies the highest position in export competitiveness, with RCA values persistently greater than one, thereby confirming Indonesia's strong comparative advantage in the production and export of this commodity. In contrast, China exhibits a fluctuating level of competitiveness, with RCA values lower than those of Indonesia, while Malaysia, Vietnam, and Egypt display relatively weaker export competitiveness, particularly toward the end of the observation period.

Comparison of Indonesia and China's Competitiveness

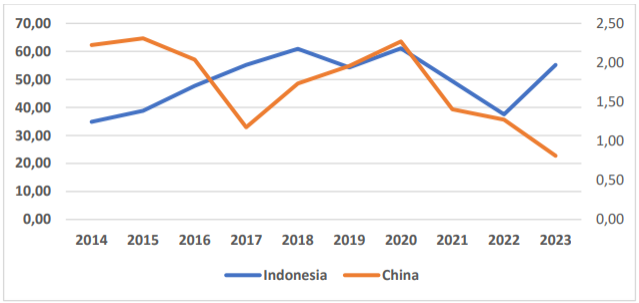

Figure 4. Trends in RCA Value of Coconut Shell Charcoal (HS 4402) Exports from Indonesia and China.

Source : data processed

The data indicate that the RCA values of China's coconut shell charcoal exports to the Saudi Arabian market during the 2014–2023 period tend to be relatively low and fluctuating. China's RCA increased from 2.22 in 2014 to 2.31 in 2015, but subsequently followed a downward trend, reaching its lowest level of 0.81 in 2023, which reflects a weakening of China's comparative advantage in this commodity. These fluctuations suggest that coconut shell charcoal is not a leading export sector for China, primarily due to limitations in raw material availability, despite the country's relatively advanced industrial capacity and processing technology. The average RCA value for China over the observation period was 1.719, significantly lower than that of Indonesia, indicating that this commodity contributes only marginally to China's overall export structure. Consequently, China's role in the Saudi Arabian market is more that of a complementary supplier rather than a main player. Nevertheless, the potential for improving competitiveness remains open should China succeed in securing raw material supplies and increasing its strategic focus on this sector in the future.

Comparison of Indonesia and Malaysia's Competitiveness

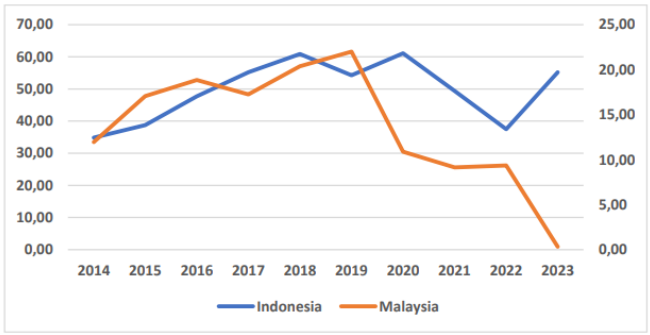

Figure 5. Trends in RCA Value of Coconut Shell Charcoal (HS 4402) Exports from Indonesia and Malaysia.

Source : Data Processed

The data illustrate the development of Malaysia's RCA values for coconut shell charcoal exports to the Saudi Arabian market during the 2014–2023 period, which exhibit a fluctuating pattern. In the early years, Malaysia recorded relatively high RCA values, amounting to 11.95 in 2014 and increasing to a peak of 22.01 in 2019, indicating a strong comparative advantage supported by the expansion of the processing industry and improved access to international

markets. However, after 2019, Malaysia's RCA values declined sharply, from 10.89 in 2020 to only 0.33 in 2023, signaling a significant weakening of its competitiveness in the Saudi Arabian market. This decline has been influenced by intensifying competition, shifts in Malaysia's national export structure, and disruptions in global supply chains in the post-pandemic period. Although Malaysia's average RCA value over 2014–2023 remains relatively high at 13.723, the downward trend observed in recent years suggests that its export competitiveness has been unstable and increasingly weakened, thereby reducing Malaysia's position as a major competitor to Indonesia.

Comparison of Indonesia and Vietnam's Competitiveness

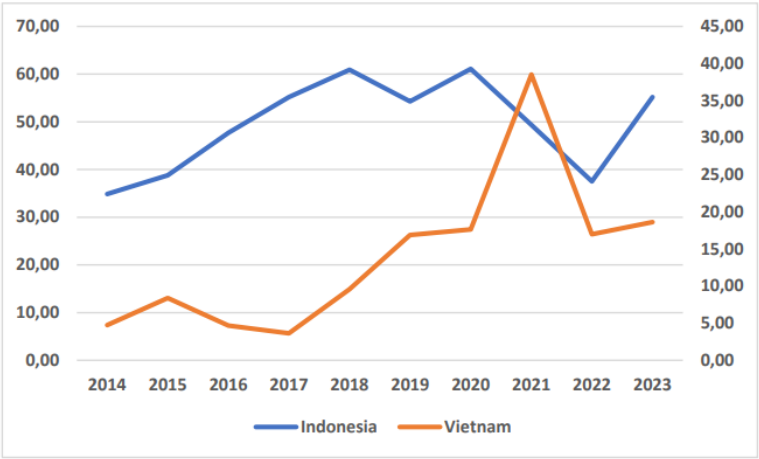

Figure 6. Trends in RCA Value of Coconut Shell Charcoal (HS 4402) Exports from Indonesia and Vietmam

Source : Data processed

The data indicate that Vietnam's RCA values for coconut shell charcoal exports to the Saudi Arabian market during the 2014–2023 period fluctuated considerably. In the early years, Vietnam's RCA values were moderate and relatively unstable, increasing from 4.74 in 2014 to 8.39 in 2015 before declining in subsequent years. The most notable change occurred in 2021, when Vietnam's RCA value surged sharply to 38.52, indicating a substantial improvement in export competitiveness and the country's ability to capitalize effectively on market opportunities. This sharp increase suggests that, despite previously inconsistent performance, Vietnam possesses significant potential to emerge as a strong competitor in the Saudi Arabian market, provided that it can sustain its export performance over the long term.

Comparison of Indonesia and Egypt'sCompetitiveness

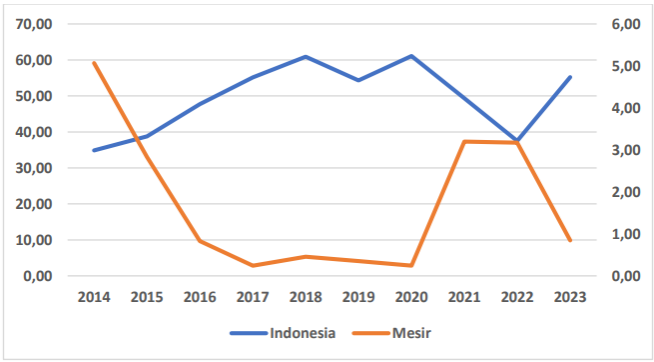

Figure 7. Trends in RCA Value of Coconut Shell Charcoal (HS 4402) Exports from Indonesia and Egypt

Source : Data processed

The figure shows that Egypt's RCA values for coconut shell charcoal exports to the Saudi Arabian market during the 2014–2023 period were generally low and volatile. Egypt's RCA was recorded at 5.07 in 2014, but subsequently declined sharply and remained below one for most of the observation period, reaching its lowest level of 0.24 in both 2017 and 2020. This pattern indicates that Egypt does not possess a strong comparative advantage in exporting coconut shell charcoal.

The average RCA value for Egypt over the 2014–2023 period was 1.724, suggesting that this commodity contributes only marginally to Egypt's total exports and is not a priority sector. Limited availability of raw materials, relatively small production scale, and weak price competitiveness are the main factors constraining Egypt's position compared to major competitors such as Indonesia, Malaysia, and Vietnam. Although a temporary improvement was observed during 2021–2022, this trend was not sustained. Consequently, Egypt remains a minor player and has not been able to compete significantly in the Saudi Arabian market.

Export Dynamic Product (EPD) Analysis Results for Coconut Charcoal Briquettes (HS 4402) in the Saudi Arabian Market

The dynamics of Indonesia's coconut shell charcoal exports to the Saudi Arabian market can be analyzed using the Export Product Dynamics (EPD) method, first introduced by Widodo (2008).

Table 3. EPD Results for Coconut Shell Charcoal Briquettes Exported to Saudi Arabia 20142023.

Country	EPD		Market Position
	Growth Market Share Growth (X)	Product Market Share Growth (Y)	
Indonesia	0,011113	-0.000256	*Lost opportunity*
China	-0,009769	0.008533	*Falling star*
Malaysia	-0,007829	0.000038	*Falling star*
Vietnam	0,006902	0.000142	*Rising star*
Mesir	-0,004704	0.000128	*Falling star*

Source : Data processed

Based on the table above, clear differences are observed in the competitive dynamics of coconut shell charcoal briquette exports among exporting countries. To facilitate comparison, the EPD results are presented in the form of a matrix.

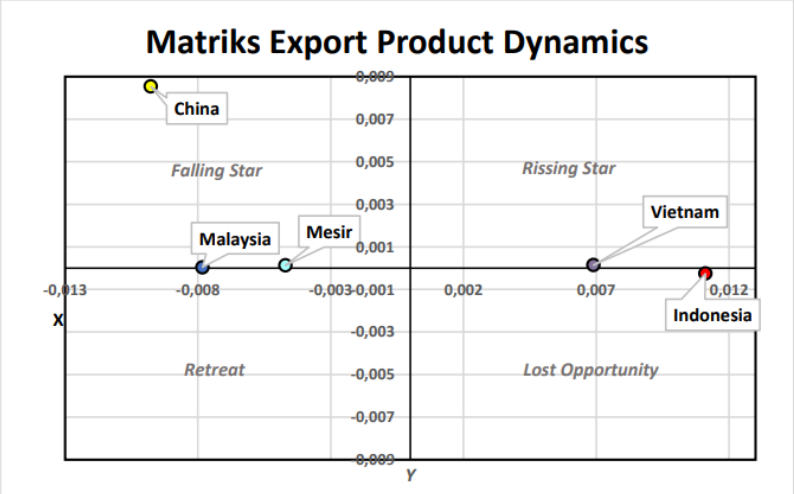

Figure 7. Export Product Dynamics (EPD) Matrix for Coconut Shell Charcoal Briquettes Exporting Countries to the Saudi Arabian Market 20142023

Source : Data processed

The EPD analysis indicates that Indonesia is positioned in the *lost opportunity* category. Although the growth of export market share is positive (0.011113), the product market share has declined (–0.000256), suggesting that increases in export performance have not been accompanied by an expansion of international market share. This condition implies that existing market potential has not been fully utilized, and Indonesia's competitiveness continues to face challenges, particularly in terms of product quality, compliance with standards, and marketing strategies.

China and Malaysia are both classified as *falling stars*. China records positive growth in product market share (0.008533) but experiences a decline in export market share (–0.009769). Similarly, Malaysia shows negative growth in export market share (–0.007829) alongside stagnant growth in product market share (0.000038). These positions reflect a weakening of competitiveness in both countries, driven by intensified global competition and limitations in sustaining export performance.

Vietnam, in contrast, occupies the *rising star* position, with positive growth in both export market share (0.006902) and product market share (0.000142), indicating strong potential to enhance its competitiveness in the international market. Meanwhile, Egypt is categorized as a *falling star*, as its product market share increases slightly (0.000128) while its export market share declines (–0.004704).

XModel Analysis Results of Potential Export Products of Coconut Charcoal Briquettes (HS 4402) in the Saudi Arabian Market

Table 4. XModel Results of Coconut Shell Charcoal Briquettes Exported to Saudi Arabia from 2014 to 2023.

Country	Avverage RCA (2014-2023)	EPD Position	Market Performance
Indonesia	49.07	*Lost opportunity*	Potential Market
China	0.41	*Falling star*	Potential Market
Malaysia	13.72	*Falling star*	Potential Market
Vietnam	13.97	*Rising star*	Optimis Market
Mesir	1.72	*Falling star*	Potential Market

Source : Data processed

Based on Table 4, differences can be observed in the export potential positions of coconut shell charcoal briquettes among the exporting countries. To clarify this comparison, the results of the X-Model calculations are presented in matrix form in the figure below.

Figure 8. XModel Matrix of Coconut Shell Charcoal Briquettes Exporting Countries to the Saudi Arabian Market 20142023

Source : Data processed

The X-Model analysis reveals a clear contrast between comparative advantage and market growth dynamics among countries exporting coconut shell charcoal briquettes to Saudi Arabia Indonesia exhibits the most dominant comparative advantage, as reflected by an average RCA value of 49.49. However, based on the EPD results, Indonesia is positioned in the *lost opportunity* category and is therefore classified as a *potential market*. This condition indicates that despite its strong structural advantage, Indonesia has not yet been able to optimize sustainable growth in market share.

Vietnam is the only country classified as an *optimistic market*, with an average RCA value of 13.97 and an EPD position of *rising star*, reflecting a favorable combination of comparative advantage and positive market growth dynamics. Meanwhile, Malaysia, Egypt, and China are positioned as *falling stars* and categorized as *potential markets*, albeit with relatively weaker competitiveness and export dynamics that tend to decline.

Overall, these findings emphasize that export success is not determined solely by high RCA values, but also by the ability to sustain and expand market share growth. In this context, although Indonesia remains competitively superior in comparative terms, its *lost opportunity* position highlights the need for more adaptive and market-oriented export strategies so that its comparative advantage can be transformed into sustainable competitive advantage.

5. Conclusions

Based on the analysis of Revealed Comparative Advantage (RCA), Export Product Dynamics (EPD), and the X-Model, Indonesia demonstrates a remarkably strong comparative advantage in the export of coconut shell charcoal briquettes (HS 4402) to the Saudi Arabian market. This is reflected in an average RCA value of 49.49 during the 2014–2023 period, which significantly exceeds that of competing nations. However, Indonesia's position in the EPD analysis is categorized as a "lost opportunity," indicating that this comparative advantage has not been fully accompanied by optimal growth in export market share. Within the X-Model framework, this condition classifies Indonesia as a "potential market," signifying that substantial opportunities for export development remain if supported by strategies that are more adaptive and oriented toward market demand dynamics.

In contrast, Vietnam shows the most progressive export performance with a "rising star" position and is categorized as an "optimistic market," reflecting its success in combining comparative competitiveness with sustainable export growth. Meanwhile, Malaysia, China, and Egypt are in "falling star" positions and classified as "potential markets," indicating that although development opportunities still exist, these three countries face challenges in maintaining and increasing export competitiveness. These findings emphasize that export success is determined not only by a high comparative advantage but also by a country's ability to consistently and sustainably strengthen its market share growth.

References

Anjamaniz, A., & Yulistia, J. O. (2024). Analisis ekspor briket arang Indonesia: Strategi dan peluang. *Jurnal Ilmiah Ekonomi Manajemen Bisnis Dan Akuntansi*. https://doi.org/10.61722/jemba.v2i1.642

Aresta Putri, L., Syaukat, Y., & Feryanto. (2024). Dynamics of competitiveness and market position of Indonesian coconut shell charcoal exports in the international market. *Jurnal Sosial Ekonomi Dan Kebijakan Pertanian, 8*(3), 906–920. http://ejournal2.undip.ac.id/index.php/agrisocionomics

Balqis, P., & Yanuar, R. (2021). Daya saing ekspor lada Indonesia di pasar Amerika dan Eropa. *Forum Agribisnis, 11*(2), 182–194. https://doi.org/10.29244/fagb.11.2.182-194

Dewi Mahrani Rangkuty, Lia Nazliana Nasution, Zata Hasyyati, Sulisna Dewi Siregar, & Didi Firmansyah. (2024). *Teori kebijakan moneter, fiskal, dan perdagangan internasional* (pp. 41–73). Tahta Media Group.

Elpawati, Inayah, T., Arlita, A. D., Benalywa, Z. A., & Ismail, M. M. (2024). Measuring the comparative and competition of Indonesian wood charcoal exports in the Saudi Arabian market. *Journal of Law and Sustainable Development, 12*(3), e3320. https://doi.org/10.55908/sdgs.v12i3.3320

Kementerian Keuangan. (2022). *Penetapan sistem klasifikasi barang dan pembebanan tarif bea masuk atas barang impor*.

Kementerian Lingkungan Hidup dan Kehutanan. (2023, January 30). Menteri LHK: Penyelesaian tata batas menuju penetapan kawasan hutan tahun 2023. *www.ppid.menlhk.go.id*.

Milhatu Rojaba. (2023). *Daya saing vanilla (Vanilla planifolia Andrews) Indonesia di pasar internasional tahun 2011–2020*.

Nasution, L. N., Suhendi, S., Rusiadi, R., Rangkuty, D. M., & Abdiyanto, A. (2022). COVID-19 pandemic: Impact on economic stability in 8-EM Muslim countries. *Atestasi: Jurnal Ilmiah Akuntansi, 5*(1). https://doi.org/10.57178/atestasi.v5i1.626

Phung, C. K., & Wikartika, I. (2024). Pemanfaatan pemasaran digital: Meningkatkan potensi ekspor briket arang tempurung kelapa dalam bisnis internasional. *El-Mujtama: Jurnal Pengabdian Masyarakat, 4*(2), 599–612. https://doi.org/10.47467/elmujtama.v4i2.963

Putri, L. A., & Hidayat, N. K. (2023). Analisis komparasi daya saing ekspor arang tempurung kelapa ASEAN di pasar Jepang. *Indonesian Journal of Agriculture Resource and Environmental Economics, 2*(1), 25–36. https://doi.org/10.29244/ijaree.v2i1.50008

Rahman Tsani, R., Kelautan, L., Muhammad Mauluddin, F., Christian Hotlan Tinambunan, R., & Fajar Maulani, S. (2022). Analisis kualitas produk arang briket pada kebutuhan pasar ekspor di Timur Tengah dan Eropa pada PT. Nudira Sumber Daya Indonesia Oleh. *Jurnal Ekonomi Dan Bisnis, 11*(3).

Rosita, N. (2017). *Sriwijaya International Journal of Dynamic Economics and Business: Analysis of work performance and export competitiveness in province of Indonesia. SIJDEB, 1*(3), 277–296. http://ejournal.unsri.ac.id/index.php/sijdeb

Septian Wulandari, R. (2021). *Analisis daya saing dan faktor-faktor yang memengaruhi ekspor arang tempurung kelapa Indonesia ke negara tujuan utama*.

Suhardi, & Afrizal. (2021). *Keunggulan komparatif ekspor Indonesia*. *JEM: Jurnal Ekonomi Dan Manajemen STIE Pertiba Pangkalpinang, 7*, 29–46.
Ulfah, M., Samsir, A., & Alam, S. (2023). Analysis of the competitiveness of Indonesian rubber exports in the international market (Vol. 2, Issue 1). https://ecbis.net/index.php/go/index
UNCTAD. (2020). *Trade and development report 2020*. United Nations Conference on Trade and Development.
Yuliana Maria Dwi PB. (2017). *Optimalisasi bahan baku kelapa*. http://djpen.kemendag.go.id