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Why High Comparative Advantage Does Not Guarantee Market Growth in Indonesian Cocoa Butter Exports ?

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ABSTRACT

Indonesia ranks as the world's third-largest cocoa butter exporter, contributing 11% to global exports. However, export values have declined from USD 791 million (2020) to USD 627 million (2023), presenting a paradox given Indonesia's substantial production capacity, established infrastructure, and supportive policy interventions.This study analyzes the comparative advantage and export performance dynamics of Indonesian cocoa butter in global markets during 2010–2023, using an integrated Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD) framework. Time-series export data were obtained from UN COMTRADE, ITC, and Trademap for HS code 180400. The study compares Indonesia with Malaysia across two contrasting destination markets: the United States (mature, high-value market) and Estonia (emerging EU gateway). RCA analysis measures comparative advantage based on export structure specialization, while EPD categorizes competitive positioning into four quadrants: Rising Star, Falling Star, Lost Opportunity, and Retreat. Indonesia demonstrates exceptionally high RCA values (Estonia: 87.80; US: 50.43), confirming strong comparative advantage. However, EPD analysis reveals divergent market dynamics: Indonesia achieves Rising Star status in Estonia (expanding market share in growing market) but Falling Star status in the US (gaining share in declining market). Malaysia falls into the Lost Opportunity quadrant in both markets, indicating declining competitiveness. The findings reveal a critical RCA-EPD paradox: high comparative advantage does not guarantee sustainable market growth. While RCA reflects structural export specialization, EPD captures dynamic competitive positioning. This divergence underscores that export strategies must integrate both static comparative advantage and dynamic market responsiveness. For Indonesia, maintaining competitiveness requires market diversification, product upgrading, and adaptive strategies tailored to market-specific demand trajectories.

Keywords: Cocoa Butter, Comparative advantage, Export performance RCA-EPD integration, Market dynamics

INTRODUCTION

Indonesia is one of the agrarian countries with a comparative advantage in producing various plantation commodities. In the agricultural trade balance, the plantation subsector plays a role as a national mainstay which consistently produces surpluses from commodity export activities such as palm oil, coffee, rubber, cocoa, and tea, of which Indonesia is the world's main producer (Sanyal et al., 2022).

As the leading cocoa producer in Asia, Indonesia has approximately 1.5 million hectares of cocoa plantations and

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ranks sixth among the world's largest cocoa-producing countries. This commodity not only provides income for millions of farmers but also contributes significantly to national foreign exchange earnings through exports.

Cocoa is one of the strategic plantation commodities that plays a vital role in Indonesia's economy, both as a source of farmers' income and as a contributor to foreign exchange. According to data from Statistics Indonesia (BPS) and the Ministry of Trade, the export value of cocoa and its derivative products reached USD 1.26 billion in 2022, an increase compared to USD 1.21 billion in the previous year. This achievement positioned cocoa as the fourth-largest foreign exchange contributor from the plantation subsector in that year. (Kementerian Pertanian, 2024). One of the leading derivative products of cocoa is cocoa butter, which is widely used in the food, cosmetics, and pharmaceutical industries. This product has high added value and continues to experience growing global demand.

Indonesia holds a strategic position in the global cocoa butter trade. A country's economic progress can be determined through international trade activities, namely exports and imports, by utilizing natural and human resources to compete with other nations (Pratama, Darwanto dan Masyhuri, 2020).

Indonesia ranked as the world's third-largest exporter of cocoa butter in 2023, contributing approximately 11% to global exports with an export value of USD 626.86 million (Tridge, 2025; WITS, 2023). The major destinations included the United States, India, Estonia, Australia, and China (WITS, 2023). However, export values showed a declining trend, decreasing by 1.48% from USD 636 million in 2022 to USD 626 million in 2023 (TrendEconomy, 2024). Despite this decline, cocoa butter remains Indonesia's largest cocoa export commodity, accounting for 40.24% of total cocoa export volume (Statista, 2025).

Nevertheless, despite maintaining a high export ranking, Indonesia's success in penetrating international markets is not without challenges. The export value of Indonesian cocoa butter has shown a declining trend. In 2020, exports reached USD 791 million, but fell to USD 668 million in 2021, USD 636 million in 2022, and further decreased to USD 627 million in 2023 (UN Comtrade, 2025). This condition is influenced by several factors, including intense global competition, fluctuations in world market prices, dependence on specific markets, as well as issues related to production efficiency and the sustainability of raw material supplies. This downward trend presents a paradox: despite Indonesia possessing the fundamental prerequisites for market leadership—including substantial production capacity, established processing infrastructure, broad market access, and supportive policy interventions—actual export performance remains incongruent with this potential.

This decline indicates potential challenges to Indonesia's competitiveness in the global market. It raises concerns about the sustainability of the product's competitive advantage in international trade, particularly as rival countries continue to strengthen their positions through improved production efficiency, innovation, and market expansion. Beyond global challenges, domestic factors also affect the competitiveness of Indonesian cocoa butter. At the upstream level, persistent issues remain in terms of cocoa bean quality, limited adoption of post-harvest technology, and weaknesses in the supply chain system. At the downstream level, the processing industry still faces obstacles in enhancing production efficiency, product innovation, and penetration into new markets. These issues highlight a gap between the commodity's potential and its export

performance, underscoring the need for further research. The combination of internal and external challenges calls for strategies grounded in a comprehensive analysis of Indonesia's competitive position in the export market.

Previous studies have examined cocoa exports in general, yet research specifically addressing the competitiveness of Indonesian cocoa butter exports and the dynamics of its position in the international market remains limited. Considering that cocoa butter is a high value-added product that plays a significant role in the global food and cosmetics industries, such a study is both relevant and necessary. Moreover, with product diversification and downstream development being key priorities in Indonesia's national economic agenda, assessing the competitiveness of processed products like cocoa butter becomes particularly important. This study is expected to provide insights into Indonesia's strengths in competing with other countries and to identify strategies for enhancing export performance in a sustainable manner.

Several studies have shown that the competitiveness of processed cocoa exports is determined not only by production efficiency but also by compliance with sustainability standards, certification, and environmental footprints (Tennhardt et al., 2023; Parra-Paitan et al., 2024; Sassen et al., 2022). The concept of downstream processing or grinding at origin has proven to increase foreign exchange earnings in major cocoa-producing countries such as Ghana (Kongor et al., 2024), making it highly relevant for Indonesia to expand its cocoa butter production. Moreover, energy and water efficiency within the production chain are critical factors influencing the export price competitiveness of cocoa butter (Awafo & Owusu, 2022). These findings highlight the importance of adopting a comprehensive strategy that combines comparative advantages with sustainable competitiveness.

Faced with these challenges, this study aims to provide a comprehensive analysis to measure the level of comparative advantage and observe the developmental trends of Indonesian cocoa butter products in the international market. To objectively evaluate Indonesia's competitive position, an appropriate analytical approach must be employed. One such method is the Revealed Comparative Advantage (RCA) index developed by Balassa, which measures a country's comparative advantage based on its actual export structure. By applying this method, it is possible to determine whether Indonesian cocoa butter possesses relatively higher competitiveness compared to that of rival countries.

However, the RCA analysis is static in nature and does not capture market dynamics over time. Therefore, it needs to be complemented with the Export Product Dynamics (EPD) method, which provides a dynamic perspective. The EPD framework enables the mapping of export products in terms of market growth and relative competitiveness. By combining RCA and EPD approaches, competitiveness analysis becomes more comprehensive, covering both the potential and risks of international trade.

Through this research, it is expected that a clearer understanding will be obtained regarding the strengths, opportunities, and threats faced by Indonesia in the global cocoa butter trade. The findings of this study may also serve as a reference for formulating strategies to strengthen exports, expand destination markets, and improve downstream cocoa industry policies. In this way, the study is expected not only to contribute to the academic literature but also to provide practical benefits for the government, industry players, and other stakeholders in building sustainable national cocoa competitiveness.

RESEARCH METHOD

This study was conducted to analyze the competitiveness of Indonesia's cocoa butter exports in the international market during the period 2010–2023. A descriptive quantitative approach was employed, utilizing secondary data in the form of cocoa butter export statistics from Indonesia and its competitor country, Malaysia. The data were obtained from official sources such as the United Nations COMTRADE, the International Trade Centre (ITC), and Trademap, which provide global trade information based on the Harmonized System (HS) code 180400 for cocoa butter commodities.

The measurement of competitiveness employed two analytical methods: Revealed Comparative Advantage (RCA) and Export Product Dynamics (EPD). The RCA method provides an overview of a product's comparative advantage by comparing a country's actual export performance with that of the world. The RCA value is calculated by comparing the share of cocoa butter exports in Indonesia's total exports with the corresponding share at the global level. If the RCA value is greater than 1, the product is considered to have a comparative advantage and high competitiveness, whereas an RCA value of less than 1 indicates low comparative advantage and competitiveness. The Revealed Comparative Advantage (RCA) values exhibited relatively strong trends during the observation period. RCA is widely used to assess whether a country possesses a comparative advantage in a particular product, with values above 1 interpreted as evidence that the product is exported more intensively than the world average. The RCA formula can be expressed as follows (Balassa, 1965)

$$\mathrm{RCA} = \frac{\mathrm{Xij}/\mathrm{Xnj}}{\mathrm{Xit}/\mathrm{Xnt}}$$

Description:
Xij = Export value of a specific commodity from Indonesia to the destination country
Xnj = Total export value of all commodities from Indonesia to the destination country
Xit = Export value of a specific commodity from the world to the destination country
Xnt = Total export value of all commodities from the world to the destination country

In addition to RCA, the Export Product Dynamics (EPD) method was employed to map the dynamics of Indonesia's cocoa butter exports within a market growth and market share matrix. EPD categorizes the competitive position of a product into four quadrants: Rising Star, Falling Star, Lost Opportunity, and Retreat. This analysis not only illustrates the relative strength of Indonesia's exports but also provides strategic direction by observing export trends and positions in the international market. The quadrant mapping is derived from the position of business strength (X-axis) and market attractiveness (Y-axis), using the following formula.

$$\mathrm{X-axis} = \frac{\sum_{t=1}^{n}\left(\frac{\mathrm{Xi}}{\mathrm{Wi}}\right)\mathrm{t\ x\ 100\%} - \sum_{t=1}^{n}\left(\frac{\mathrm{Xi}}{\mathrm{Wi}}\right)\mathrm{t-1\ x\ 100\%}}{\mathrm{T}}$$

$$\mathrm{Y-axis} = \sum_{t=1}^{n}\left(\frac{\mathrm{Xi}}{\mathrm{Wi}}\right)\mathrm{t\ x\ 100\%} - \sum_{t=1}^{n}\left(\frac{\mathrm{Xi}}{\mathrm{Wi}}\right)\mathrm{t-1\ x\ 100\%}$$

Description:
Xi = Export value of a specific commodity from Indonesia
Xt = Total export value of all commodities from Indonesia
Wi = Export value of a specific commodity from the world

Wt = Total export value of all commodities from the world

The Rising Star quadrant represents a condition in which Indonesia's market share increases in line with the growth of the global market. This is considered an ideal situation, as the market is expanding and Indonesia is able to capitalize on the momentum. Conversely, the Falling Star quadrant occurs when Indonesia's market share is increasing while the global market is declining. Although this condition may provide short-term benefits, the risk of future demand contraction must be anticipated. The Lost Opportunity quadrant describes a situation in which the global market is growing but Indonesia's market share is weakening, indicating that potential opportunities have not been fully captured. Meanwhile, the Retreat quadrant is the least favorable condition, as Indonesia's market share declines alongside a contraction in the global market. The mapping of product competitiveness quadrants using the EPD method is illustrated in Figure 1.



Source: Esterhuizen (2006)

Figure 1
Mapping of Product Competitiveness Quadrant through the Export Product Dynamics (EPD) Method

The country selected for analysis as Indonesia's main competitor, based on the highest cocoa butter export value during the same period, is Malaysia. Meanwhile, the export destination markets analyzed for both Indonesia and Malaysia include countries with high and consistent demand for cocoa butter products, namely the United States and Estonia. By combining these two analytical methods, the results are expected to provide a comprehensive overview of the competitiveness of Indonesia's cocoa butter exports and the strategic direction for strengthening its future export performance.

RESULTS AND DISCUSSION

Competitiveness can be observed from market share; if the market share of a commodity increases, it indicates that competitiveness is also increasing (Ginting, Rahmanta dan Lindawati, 2021). The measurement of competitiveness can be assessed from both comparative and competitive advantages. The competitiveness of cocoa butter from each exporting country reflects the export performance of those countries in the global market.

Comparative advantage can be analyzed using the Revealed Comparative Advantage (RCA) method, which aims to compare Indonesia's cocoa butter competitiveness with that of other exporting countries in key destination markets. An RCA value greater than 1 indicates that Indonesian cocoa butter has strong competitiveness, while an RCA value less than 1 suggests weak competitiveness. The average RCA

values of cocoa butter exports from Indonesia and its competitor country to the main destination market, namely Estonia, are illustrated in Figure 2.

The average RCA value of Indonesian cocoa butter exports to the Estonian market is greater than one, at 87.80. [I7.1] The exceptionally high RCA values observed in this study (ranging from 24.83 to 122.75) warrant careful methodological interpretation. First, these values reflect extreme export specialization rather than proportional increases in global competitiveness. Indonesia's cocoa butter RCA of 87.80 in Estonia indicates that cocoa butter's share in Indonesian exports to Estonia is 87.8 times higher than the world average a function of (1) cocoa butter's dominant position within Indonesia's cocoa export portfolio (40.24% of total cocoa exports), and (2) Estonia's role as a niche EU distribution hub with concentrated import sources.

Second, high RCA values do not guarantee real market share growth. The US market demonstrates this paradox: despite a high RCA of 50.43, Indonesia's EPD classification is Falling Star, indicating that while comparative advantage persists structurally, the global market is contracting (Y-axis = -0.00003427). This reveals that RCA measures relative export composition (intensive margin), whereas EPD captures dynamic competitive positioning (extensive margin).

Third, the stability of high RCA values over 2010-2023 reflects structural path dependency in Indonesia's cocoa export model. While this indicates established production capacity and market access, it also signals limited diversification into higher value-added products. The divergence between RCA and EPD outcomes across markets (Rising Star in Estonia vs. Falling Star in US) underscores that comparative advantage alone is insufficient for sustainable competitiveness market-specific demand dynamics, competitive intensity, and adaptive strategies are equally critical determinants of export performance.

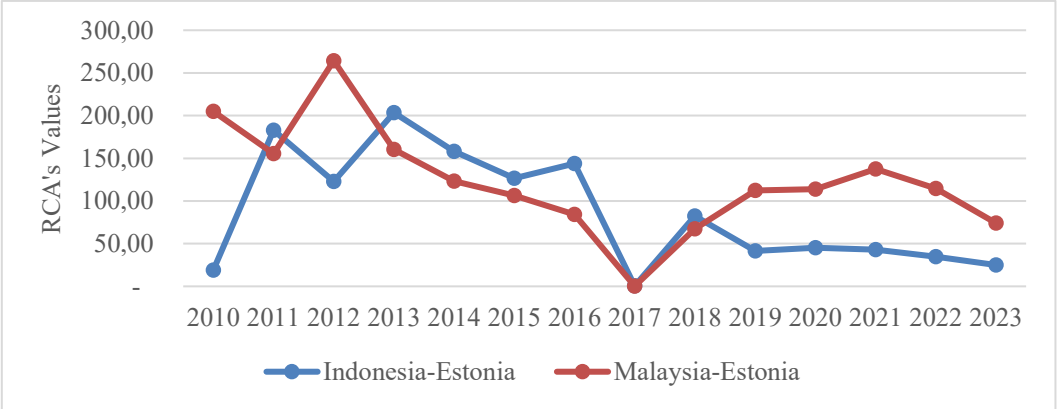


Figure 2
Trends in Revealed Comparative Advantage (RCA) Values of Indonesia and Malaysia in the Estonian Market, 2010–2023

The higher average RCA value of Malaysian cocoa butter compared to that of Indonesia indicates that Malaysian cocoa butter holds a stronger position in the export market to Estonia. The analysis of average RCA values for Indonesian cocoa butter and its competitor in the next main destination market, namely the United States, is presented in Figure 3. The average RCA value of Indonesian

cocoa butter exports to the U.S. market is greater than one, at 50.43. This demonstrates that Indonesia's cocoa butter competitiveness is far above the world average, signifying that Indonesia possesses a strong comparative advantage and that its cocoa butter is highly competitive in the U.S. market. Malaysia, meanwhile, also recorded an average RCA value greater than one, at 24.83 in the U.S. market, which similarly indicates that Malaysian cocoa butter maintains strong competitiveness in the United States.

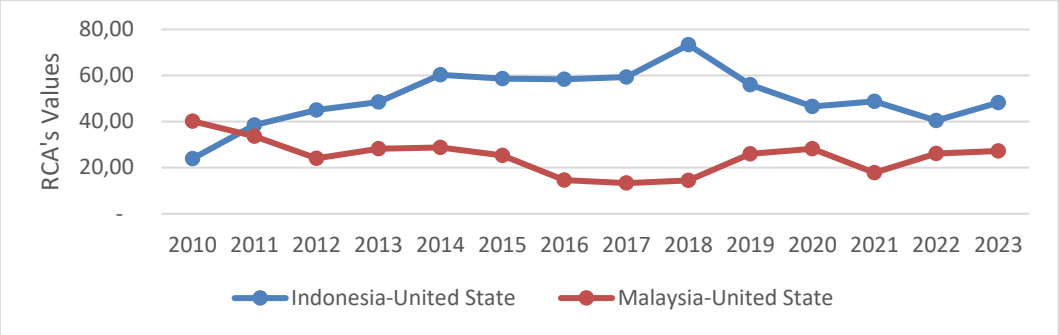


Figure 3
Trends in Revealed Comparative Advantage (RCA) Values of Indonesia and Malaysia in the United States Market, 2010–2023

The result of the Revealed Comparative Advantage (RCA) calculation indicate that Indonesian cocoa butter consistently maintains a strong comparative advantage in the Estonian and United States markets, with average values of 87.80 and 50.43, respectively. These figures, which significantly exceed the threshold of one (RCA > 1), confirm that this commodity is a specialized product within the national export structure. Critically, these high RCA values reflect the success of early downstreaming policies that successfully transformed a dependence on raw material exports into high-value processes products. This finding is consistent with previous research by Nurwansyah et al. (2024) which demonstrated that Indonesia's cocoa butter exports have strong competitiveness in the global market.

However, the sharpd fluctuations visible in Figure 2 and Figure 3 represent structural vulnerabilities to global price volatility and shifting consumer preferences in developed markets. Although Indonesia outperforms Malaysia in the United States market, the declining RCA trends in certain periods suggest that a static comparative advantage is no longer sufficient to face global competition, which increasingly prioritizes quality standards and sustainability over mere volume.

For comparison, the RCA calculation for Malaysia, as another major exporter of processed cocoa, also shows relatively high values. In several markets, both Indonesia and Malaysia are able to maintain RCA values greater than one, resulting in intense competition between the two. There are markets where Indonesia is more dominant with a more stable RCA, but there are also markets where Malaysia holds a stronger position with higher RCA values than Indonesia. This condition illustrates that the relative positions of the two countries vary significantly, meaning that export strategies must consider product differentiation, logistical efficiency, and strengthening relationships with key buyers in each market to generate

positive impacts on export performance (Haddoud et al., 2017). Product differentiation strategies, as found in the study by Ju et al. (2017) have been shown to positively influence the export performance of a country's commodities in the global market.

Although RCA provides an overview of comparative advantage, this indicator alone is not sufficient to determine market development strategies. Therefore, the analysis is complemented with the Export Product Dynamics (EPD) approach. EPD evaluates changes in Indonesia's export share relative to changes in the world market share and maps the results into four quadrants: Rising Star, Falling Star, Lost Opportunity, and Retreat.

The EPD mapping results show that most of Indonesia's main cocoa butter export markets, particularly Estonia, fall into the Rising Star category. This finding reinforces the earlier RCA results, indicating that the product not only possesses strong competitiveness but also has promising growth prospects. Markets in this category generally have a large food and beverage industry base and enforce strict quality standards. Hence, Indonesia's success in maintaining and even expanding its market share highlights the quality and consistency of its competitive exports. Indonesia's position in the Rising Star quadrant of the Estonian market indicates that, in addition to an increase in Indonesia's export share, the global market for cocoa butter in that country also shows a positive growth trend (Fahmid et al., 2022).

Table 1
Average Export Product Dynamics (EPD) Values of Cocoa Butter Exports, 2010–2023

Cocoa Butter Export Destination		Average Value		Position
		X	Y	
EPD to Estonia's Market	Indonesia – Estonia	0,03038382	0,00117652	Rising Star
	Malaysia – Estonia	-0,01167996	0,00011907	Lost Opportunity
EPD to U.S's Market	Indonesia – United State	0,01141885	-0,00003427	Falling Star
	Malaysia – United State	-0,00782033	0,00005291	Lost Opportunity

The Export Product Dynamics (EPD) analysis provides a deeper economic explanation of Indonesia's competitive. In the Estonian market, as show in Table 1, the "Rising Star" position signifies that Indonesia has successfully penetrated the market while regional demand is growing. This success can be attributed to supply chain efficiensy and a stabilizing product reputation in Eastern Europe.

Such a position reflects a combination of strong competitiveness and positive demand growth in the target market. In other words, Indonesian products are not only competitive but are also occupying a market segment with significant potential for further expansion. This indicates that Indonesia's cocoa butter exports to Estonia have the potential to become a driving force in expanding market share across Eastern Europe. The main factors supporting this Rising Star position can be attributed to Indonesia's high RCA value in Estonia, coupled with steadily increasing market demand. This presents a strategic opportunity for Indonesia to strengthen market penetration, broaden distribution networks, and build product reputation in Europe.

Indonesia's position as a Rising Star

reflects dynamic and promising competitiveness. With this status, Indonesia has a significant opportunity to strengthen its market dominance by increasing export volumes, securing long-term trade contracts, and enhancing product value through certification and quality assurance. In Rising Star markets, the most relevant strategies include scaling up export volumes, reinforcing long-term contractual agreements, and adding value through sustainability certifications as well as origin-based branding.

On the other hand, there are markets categorized as Falling Star. Although Indonesia's market share is increasing, global market growth in the United States is declining. This situation provides short-term benefits but cannot serve as a foundation for sustainable expansion. Indonesia still holds opportunities in the U.S. market, but the competition is more intense, causing its market share to be gradually eroded. Critically, this indicates that Indonesia's export strategy in the U.S. remains reactive and risks becoming trapped in a saturated market segment.

The large and continuously growing U.S. market remains a key target, making it essential to strengthen competitiveness through quality improvement, product diversification, and logistical efficiency. Therefore, relevant strategies include maintaining profit margins, increasing distribution cost efficiency, and exercising caution in expanding export commitments. A comparison between the RCA and EPD results reveals that a high RCA value is not always synonymous with a Rising Star position. There are cases where RCA is high, yet the global market is declining, placing the product in the Falling Star category. This underscores the importance of using RCA and EPD together to ensure that market development priorities are accurately aligned.

Conversely, the Export Product Dynamics (EPD) analysis shows that Malaysia's position in cocoa butter exports is less favorable. In both the Estonian and U.S. markets, Malaysia falls into the Lost Opportunity quadrant. This category indicates that Malaysian products not only demonstrate declining competitiveness but also face stagnant or shrinking market demand. Malaysia has failed to capitalize on available export opportunities, thereby limiting the contribution of cocoa butter to its overall national export performance.

This quadrant illustrates a situation in which the global market for cocoa butter is actually expanding, yet Malaysia's export share is declining. Essentially, Malaysia failed to capitalize on the momentum of global demand grwoth, resulting in a lost opportunity to expand or even maintain its market share. Malaysia's placement in the Lost Opportunity category indicates weak adaptability in responding to global demand developments and could lead to a decline in market confidence if corrective strategies for market penetration are not implemented. The Lost Opportunity condition is particularly detrimental, as it reflects fundamental weaknesses in export strategies, ranging from price competitiveness and product quality to the effectiveness of trade networks. If this condition persists, Malaysia risks becoming increasingly marginalized in the global cocoa butter trade.

For Malaysia, the EPD results highlight the urgent need for a comprehensive shift in strategy. The Lost Opportunity status serves as a warning that Malaysia's competitiveness is eroding and that it risks losing its position in global trade. Malaysia must implement fundamental improvements, including enhancing raw material quality, fostering product innovation, and strengthening logistics and distribution systems. Without such strategic measures, it will be difficult for Malaysia to move out of the Lost

Opportunity quadrant and regain competitiveness against Indonesia and other exporting countries.

In the Estonian market, Indonesia's Rising Star position serves as a strong indicator of success in capitalizing on demand growth in the region. This suggests that Indonesia's cocoa butter exports still hold considerable potential for further expansion, provided that appropriate marketing strategies are implemented. In contrast, Malaysia has lost momentum by remaining in the Lost Opportunity quadrant. This indicates Malaysia's inability to seize the opportunities in a growing market, largely due to its limited competitiveness and an industrial orientation that is more heavily focused on downstream chocolate products.

In the U.S. market, although Indonesia is positioned only in the Falling Star quadrant, its condition is still more favorable than Malaysia, which once again falls into the Lost Opportunity category. The Falling Star status indicates that Indonesia retains competitiveness, but the market itself is experiencing declining growth. In this context, Indonesia at least possesses a competitive base that can be strengthened through diversification strategies, product innovation, and quality standard enhancement. While Malaysia's inability to capture opportunities in both markets provides Indonesia with a relative competitive advantage, but the "Falling Star" position serves as an alarm regarding the risks of long-term competitiveness erosion if product diversification is not promptly implemented.

These findings are consistent with Nurwansyah et al. (2024) who emphasize that Indonesian cocoa butter possesses a strong comparative advantage in international markets. However, Indonesia's Falling Star position in the U.S. market may be influenced by global price volatility (Smyth & Osei, 2021) and the concentrated structure of the global chocolate market (Muller & Bauer, 2021). Meanwhile, the Rising Star status in the Estonian market indicates opportunities for Indonesia to optimize sustainability-based branding (Vinci & Rossi, 2024; Tennhardt et al., 2023). Related studies also stress the importance of export tariffs and duty policies in maintaining competitiveness (Tupamahu & Apituley, 2022; Rahmanta & Lindawati, 2025).

CONCLUSION

Based on the integrated RCA and EPD analyses of Indonesian and Malaysian cocoa butter export performance during 2010–2023, this study reveals critical insights into the relationship between comparative advantage and dynamic competitiveness in global markets. Indonesia consistently records exceptionally high RCA values (Estonia: 87.80; United States: 50.43), confirming strong structural comparative advantage in cocoa butter exports. However, these values reflect extreme export specialization—where cocoa butter constitutes 40.24% of Indonesia's total cocoa exports—rather than proportional gains in global market dominance. This specialization is further amplified by bilateral trade concentration, particularly in Estonia's role as a niche EU distribution hub.

The critical finding of this study lies in the RCA-EPD divergence, which challenges conventional interpretations of export competitiveness. In the Estonian market, Indonesia's high RCA (87.80) aligns with its Rising Star EPD status, indicating that comparative advantage translates into sustainable competitive positioning within an expanding market. This represents an ideal scenario where Indonesia not only maintains structural specialization but also captures opportunities from positive demand growth. Conversely, in the United States market, despite maintaining a high RCA

(50.43), Indonesia falls into the Falling Star quadrant. While Indonesia's market share is increasing (X-axis: +0.0114), the global market itself is contracting (Y-axis: -0.00003), signaling vulnerability despite apparent comparative advantage. This paradox demonstrates that RCA measures relative export structure (intensive margin) while EPD captures dynamic competitive positioning (extensive margin), and high comparative advantage does not automatically ensure sustainable market growth.

In contrast, Malaysia exhibits a fundamentally different competitive trajectory. Although Malaysia maintains RCA values above unity (Estonia: 122.75; United States: 24.83), its consistent Lost Opportunity positioning in both markets reveals declining competitiveness and an inability to capitalize on market expansion. Malaysia's cocoa butter export share is declining precisely when global demand is growing, indicating fundamental weaknesses in export strategy, price competitiveness, and adaptive capacity. This divergence between Indonesia and Malaysia underscores the importance of not only possessing comparative advantage but also implementing market-responsive strategies that align with demand dynamics and competitive intensity.

The stability of high RCA values over the 14-year observation period reflects structural path dependency in Indonesia's cocoa export model. While this indicates established production capacity, processing infrastructure, and market access, it also signals limited vertical integration into higher value-added products such as finished chocolate. The persistence of semi-finished product exports (cocoa butter and cocoa powder) suggests that Indonesia has yet to fully leverage downstream processing policies implemented since 2010, which aimed to increase value addition but inadvertently reduced raw material competitiveness by over 70%.

These findings carry significant theoretical and practical implications. Theoretically, this study contributes to export competitiveness literature by demonstrating that comparative advantage alone is insufficient for sustainable competitive positioning. The RCA-EPD integration reveals that static structural specialization must be complemented by dynamic market adaptation, demand responsiveness, and strategic flexibility. Export promotion strategies cannot rely solely on RCA-based assessments; they must incorporate temporal market dynamics, competitive intensity, and demand trajectories captured by EPD analysis.

Practically, the divergent market positions require differentiated strategic interventions. For the Estonian market (Rising Star), Indonesia should pursue offensive expansion strategies: scaling up export volumes, securing long-term contractual agreements with European buyers, strengthening distribution networks across Eastern Europe, and enhancing product value through sustainability certifications (RSPO, organic) and origin-based branding. For the United States market (Falling Star), defensive repositioning strategies are critical: focusing on niche premium segments, improving cost efficiency to maintain margins, diversifying destination markets to reduce dependence on declining US demand, and upgrading to higher value-added products (chocolate confectionery) to escape commodity price pressures. Additionally, Indonesia must address persistent upstream challenges—including cocoa bean quality improvement, post-harvest technology adoption, and supply chain strengthening—to ensure raw material availability supports downstream processing capacity.

In conclusion, Indonesia retains substantial opportunities to strengthen its global cocoa butter trade position, but long-term sustainability requires moving

beyond static comparative advantage toward adaptive, market-specific competitiveness strategies. The contrasting outcomes in Estonia and the United States demonstrate that export success depends not only on what a country produces (comparative advantage) but also on how effectively it responds to evolving market conditions (competitive dynamics). Future research should examine the causal mechanisms underlying the RCA-EPD divergence, particularly the roles of price competitiveness, quality differentiation, sustainability compliance, and global value chain governance in shaping export performance trajectories.

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