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MAPPING IDEA & LITERATURE FORMAT | RESEARCH ARTICLE

A Comparative Study of Cocoa Beans in Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon Using the RCA, RSCA, and MSI Approaches

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ABSTRACT
This study analyzes the competitiveness of cocoa bean exports from Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon using the Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), and Market Share Index (MSI) approaches. Secondary data from 2014 to 2023 were collected from FAO, BPS, UN Comtrade, and Trade Map. The results show that Indonesia experienced a decline in cocoa production from 734,795 tons in 2019 to 641,741 tons in 2023, while export volume decreased by more than 70% over the same period. RCA and RSCA indices confirm that Indonesia lost its comparative advantage, with RCA values falling below one and RSCA remaining negative since 2017. In contrast, Côte d'Ivoire and Ghana consistently recorded strong competitiveness, supported by favorable policies and high productivity. Ecuador showed gradual improvement, while Cameroon's performance fluctuated due to domestic instability. MSI results reveal that Indonesia's global market share fell from 1.96% in 2014 to only 0.15% in 2023. These findings suggest that Indonesia needs to strengthen its downstream cocoa industry, enhance farm productivity, and improve policy support to regain competitiveness. The study contributes to the literature by providing a multi-country comparison of cocoa competitiveness using three quantitative indices and highlights practical implications for policymakers and industry stakeholders.

Keywords: Cocoa Beans, International Trade, Export Competitiveness, RCA, RSCA, MSI.

I. Introduction

International trade plays a vital role in fostering economic growth by enabling countries to optimize their comparative advantages and expand market access. Among various agricultural commodities, cocoa is one of the most strategic, serving as both a key raw material for the global chocolate industry and a significant source of foreign exchange for producing countries. Indonesia ranks among the world's largest cocoa producers, alongside Côte d'Ivoire, Ghana, Ecuador, and Cameroon. However, despite its considerable production capacity, Indonesia's share in the global cocoa export market has been steadily declining. According to FAO (2023) and BPS (2024), Indonesia's cocoa production fell from 734,795 tons in 2019 to 641,741 tons in 2023, mainly due to aging trees, pest infestations, and the limited adoption of modern farming

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practices. At the same time, export volumes dropped by more than 70% as domestic industries increasingly absorbed raw cocoa beans for processing into higher-value-added products such as cocoa liquor, butter, and powder. In contrast, Côte d'Ivoire and Ghana have remained dominant exporters, while Ecuador has experienced steady growth driven by fine-flavor cocoa. Several previous studies (Hasibuan et al., 2012; Al Ghozy et al., 2018; Nisa et al., 2023) have examined Indonesia's cocoa trade performance. However, most of these focused only on bilateral comparisons or single-country perspectives, leaving a research gap in multi-country comparative analyses that simultaneously employ multiple competitiveness indices. This study addresses that gap by comparing the export competitiveness of Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon using the RCA, RSCA, and MSI approaches. This research contributes to the literature by (1) providing updated empirical evidence from 2014 to 2023, (2) integrating three competitiveness indicators within a single framework, and (3) offering practical recommendations for policymakers and industry stakeholders. The findings are expected to support Indonesia in formulating effective strategies to enhance its cocoa export performance in an increasingly competitive global market.

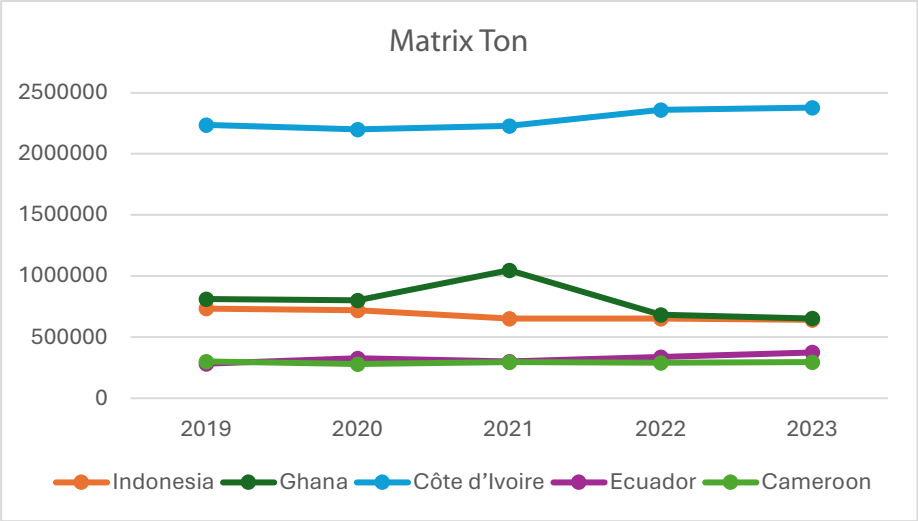

Figure 1. Cocoa Production in Major Countries Worldwide
Source: Food and Agriculture Organization: Cocoa Beans (2019-2023)

According to data from the Food and Agriculture Organization (FAO), Indonesia's cocoa production has exhibited a declining trend during the period 2019–2023, decreasing from 734,795 tons in 2019 to 641,741 tons in 2023. Statistics Indonesia (BPS) further confirms this downward trajectory, reporting a consistent annual decline in production. Several factors have contributed to this decrease, including the aging cocoa plantations, the limited adoption of modern cultivation technologies, and the persistent challenges of pests and diseases that have not been adequately addressed. In addition, less attractive price incentives for farmers and insufficient support for crop rejuvenation programs have further constrained productivity in the cocoa sector.

These conditions underscore the urgent need for structural interventions to enhance Indonesia's competitiveness in the global cocoa market (Statistics Indonesia, 2024). In contrast, Côte d'Ivoire remains the world's leading cocoa bean producer, with an output of 2.2 million tons, followed by Ghana with 1.1 million tons. Indonesia ranks third, producing 667 thousand tons, while Ecuador and Cameroon account for 337 thousand tons and 300 thousand tons, respectively. Côte d'Ivoire and Ghana, both located in West Africa, consistently dominate the top ranks of global cocoa production. Meanwhile, Ecuador and Cameroon also play significant roles in the international cocoa industry, although their production levels are relatively lower compared to the two leading West African producers (IDN Times).

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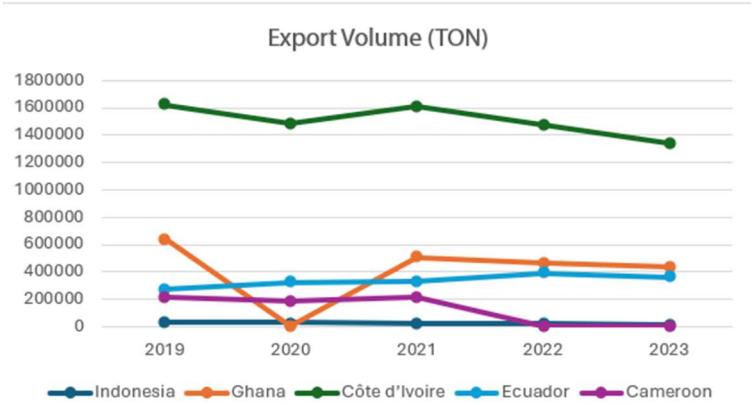

Figure 2. Export Volume of Cocoa Beans from Indonesia, Côte d'Ivoire, Ghana, Ecuador, and Cameroon to the Global Market

The graph above illustrates that Indonesia's cocoa bean export volume has shown a declining trend over the past five years. In 2019, Indonesia recorded an export volume of 30,834 tons. However, this figure decreased to 28,678 tons in 2020 and further declined to 22,280 tons in 2021. Although there was a slight increase to 24,603 tons in 2022, the volume dropped significantly in 2023 by 41.2%, reaching only 14,451 tons. This decline in cocoa bean exports can be attributed to several factors, one of which is the Indonesian government's active promotion of processed cocoa product exports such as cocoa liquor, cocoa butter, cocoa cake, and cocoa powder. With policy incentives and increased investment in the processing industry, many domestic companies have opted to absorb local cocoa beans for processing into semi-finished or finished products, which command higher prices in the global market. This strategy has consequently reduced the volume of raw cocoa bean exports but has simultaneously boosted the export of higher-value-added processed cocoa products (Rakhman, 2020). When compared to other cocoa-producing countries, Indonesia demonstrates a significantly lower export performance. Côte d'Ivoire consistently records the highest cocoa bean export volume each year, although it also experienced a decline from 1,621,749 tons in 2019 to 1,337,478 tons in 2023, representing a decrease of approximately 17.5%. Ghana, likewise, remains a major exporter, with fluctuating export volumes, but still far surpasses Indonesia. Ecuador shows an upward trend in exports, rising from 270,944 tons in 2019 to 362,727 tons in 2023, whereas Cameroon recorded no exports in 2022 and 2023, despite previously reaching 218,002 tons in 2019. These data indicate that although Indonesia is one of the major cocoa producers, its contribution to the global cocoa bean export market remains relatively small compared to its main competitors (BPS, 2024).

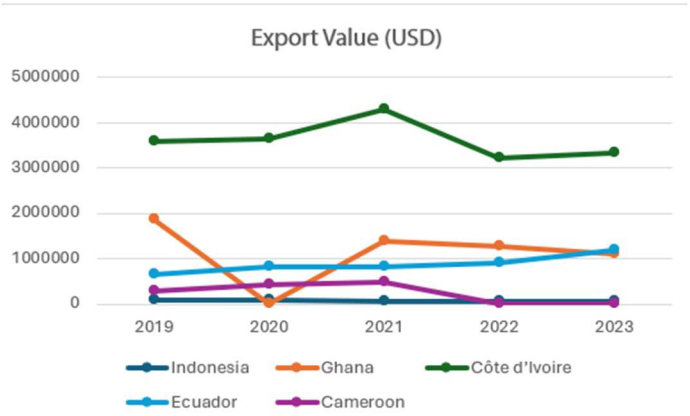

Figure 3. Export Value of Cocoa Beans from Indonesia, Côte d'Ivoire, Ghana, Ecuador, and Cameroon to the Global Market

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The graph illustrates that Indonesia experienced a significant decline in cocoa bean exports from 2019 to 2023. In 2019, Indonesia's export value reached USD 80,621, but it continued to decrease to USD 46,917 in 2023, reflecting a cumulative decline of approximately 41.8%. The sharpest decrease occurred between 2021 (USD 56,290) and 2023 (USD 46,917), amounting to 16.7%. One of the main factors behind this decline in cocoa bean export value is the domestic industry's shift of focus toward processing cocoa into higher-value-added products such as cocoa powder and chocolate, rather than exporting raw beans (ICO, 2023). In addition, government policies restricting raw cocoa bean exports to encourage downstream industries have further contributed to this trend (Ministry of Trade, 2022). Although there was a temporary increase in 2022 to USD 63,852, this recovery was short-lived, highlighting persistent challenges in Indonesia's cocoa plantation sector. Meanwhile, other major cocoa-producing countries continue to record significantly higher export values compared to Indonesia. Côte d'Ivoire remains the leading country in terms of export value, despite fluctuations from USD 3,575,416 in 2019 to USD 3,329,064 in 2023. Ghana also demonstrates a relatively strong export performance, although it has experienced a gradual decline. In contrast, Ecuador has shown remarkable growth in export value, rising from USD 657,272 in 2019 to USD 1,172,172 in 2023, representing an increase of approximately 78.4%.

This growth reflects improvements in production capacity and competitiveness in the global market. According to data from Statistics Indonesia (2024), Indonesia's cocoa export value remains far below that of other major producing countries, indicating that Indonesia's contribution to global export value is relatively low. Taken together, the three sets of data illustrate that Indonesia is indeed one of the world's major cocoa-producing countries. Nevertheless, its contribution to global trade remains limited when compared with other leading producers such as Côte d'Ivoire, Ghana, Cameroon, and Ecuador. In the context of intensifying global competition in commodity trade, it is essential to evaluate Indonesia's export competitiveness in international markets. Quantitative approaches such as Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), and the Market Share Index (MSI) are particularly useful in assessing Indonesia's relative position in the global cocoa market. These indicators provide an objective overview of the country's comparative strength and export performance, while also measuring its market share and position relative to competing nations (Laursen, 2015). Without a comprehensive analysis, Indonesia risks losing strategic opportunities to increase value-added production, expand its market share, and strengthen its position in the global cocoa value chain (Balassa, 1965).

Table 1. RCA and RSCA Indices of Cocoa Bean Exports from Major Producing Countries to the Global Market

Years	Côte d'Ivoire		RCA (%)	Ghana		RCA (%)	Indonesia		RCA (%)
	RCA	RSCA		RCA	RSCA		RCA	RSCA	
2019	568,57	0,99649	57%	227,18	0,99124	23%	0,99	-0,006	0,10%
2020	578,72	0,99655	62%	-	-	-	0,92	-0,041	0,10%
2021	618,61	0,99677	54%	204,56	0,99027	18%	0,54	-0,301	0,05%
2022	551,88	0,99638	66%	204,91	0,99029	25%	0,62	-0,237	0,07%
2023	433,61	0,99540	64%	156,90	0,98733	23%	0,43	-0,395	0,06%

Source: Trade Map (2019-2023)

Based on the RCA and RSCA indicators, Indonesia's cocoa bean export competitiveness declined significantly between 2019 and 2023. Indonesia's RCA value decreased from 0.99 in 2019 to 0.43 in 2023, while the RSCA value also fell from –0.006 in the same period to –0.395. In addition, Indonesia's competitiveness contribution compared with other major cocoa-producing countries remained very low, ranging only between 0.05% and 0.10%, indicating a weakening position of Indonesian cocoa beans in the international market. This decline can be attributed to several factors, including low productivity resulting from aging plantations, pest and disease outbreaks, and limited adoption of modern agricultural technologies (Al Ghozy, 2017). In contrast, competing countries such as Côte d'Ivoire and Ghana demonstrate strong and consistent competitiveness. Côte d'Ivoire maintains an RCA exceeding 500 and an RSCA close to 1 each year, reflecting its dominance in the global cocoa trade with a competitiveness contribution of 57%–66%. Ghana also holds a

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competitive position with RCA values above 150 and RSCA scores above 0.98. More effective trade management systems, stronger government policy support, and better implementation of technology in production and processing have contributed to the success of these two countries (FAO, 2021).

Table 2. Market Share Index (MSI) of Cocoa Bean Export Volumes

Years	Côte d'Ivoire		Ghana		Indonesia		World export
	Export Data	Market Share (%)	Export Data	Market Share (%)	Export Data	Market Share (%)	
2019	1621749	16,18	643642	6,42	30834	0,31	10024476
2020	1486051	14,82	-	-	28678	0,29	10024476
2021	1606412	20,57	508436	6,51	22280	0,29	7808920
2022	1473363	26,84	464621	8,46	24603	0,45	5489575
2023	1337478	14,19	433288	4,60	14451	0,15	9423008

Source: Trade Map (2019-2023)

The MSI table above indicates that Indonesia's cocoa exports experienced a significant decline from 2019 to 2023. In 2019, Indonesia's export volume was recorded at 30,834 tons with a global market share of 0.31%. However, this figure continued to decrease, reaching only 14,451 tons in 2023, with its market share falling to 0.15%. According to Al Ghozy (2017), this decline reflects the weak competitiveness of Indonesia's cocoa exports in the international market. The decline may be attributed to the low quality of cocoa beans, limited access to international markets, and a lack of support for sustainable export policies. Meanwhile, other major cocoa-producing countries such as Côte d'Ivoire and Ghana exhibited different trends in their export volumes and market shares. Côte d'Ivoire maintained its position as the global leader in cocoa exports, contributing the highest share of 26.84% in 2022, although it experienced a decline in 2023. Ghana also succeeded in increasing its export share to 8.46% in 2022 before recording a decline in the following year. This comparison highlights that Indonesia continues to lag in the global export structure (ICCO, 2023). This study aims to conduct a comparative analysis of production, export volume, and export value among Côte d'Ivoire, Ghana, Ecuador, Cameroon, and Indonesia by utilizing historical data from TRADE MAP, UN COMTRADE, BPS, and various other sources. The primary objective of this research is to examine differences in production, export volume, and export value, as well as to analyze the export competitiveness of these five countries using the Comparative Advantage Theory through RCA and RSCA, as well as the Market Share Index (MSI). By understanding the dynamics of trade among the major cocoa-producing countries, this study is expected to provide valuable insights.

II. Literature Review and Hypothesis Development

2.1. Theoretical Background

International trade theory suggests that countries specialize in goods where they hold a comparative advantage, enabling them to maximize welfare and market efficiency (Krugman & Obstfeld, 2018). In the agricultural commodities sector, competitiveness is often measured by trade indices such as the Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), and Market Share Index (MSI). These indices provide quantitative evidence of a country's ability to compete in global markets relative to others.

a. Revealed Comparative Advantage (RCA): introduced by Balassa (1965), RCA evaluates whether a country is specialized in exporting a particular product relative to the world average. An RCA > 1 indicates a comparative advantage, while an RCA < 1 suggests a disadvantage.

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b. Revealed Symmetric Comparative Advantage (RSCA): developed to address the asymmetry of RCA values, RSCA ranges between -1 and +1, providing a more straightforward interpretation of competitiveness (Yu et al., 2009).
c. Market Share Index (MSI): measures the share of a country's exports in the global market for a particular commodity, offering insight into relative dominance and market presence (Hinloopen & Van Marrewijk, 2001).

2.2. Cocoa in Global Trade

Cocoa beans are a critical agricultural commodity, concentrated in West Africa (Côte d'Ivoire, Ghana, Cameroon) and Latin America (Ecuador), while Indonesia is Asia's leading producer. Global demand for cocoa continues to rise, driven by the chocolate and confectionery industries (ICCO, 2022). However, production and trade patterns differ significantly across countries, reflecting differences in policy, productivity, and value-chain integration (Afoakwa, 2016; Kolavalli & Vigneri, 2017).

2.3. Previous Studies

Several scholars have examined cocoa export competitiveness:

a. Indonesia: Hasibuan et al. (2012) and Al Ghozy et al. (2018) found that Indonesia's RCA values have declined over time due to productivity constraints.
b. Ghana and Côte d'Ivoire: Gyan & Bajan (2022) highlighted the strong comparative advantage of West African exporters supported by government interventions.
c. Ecuador: Suarez et al. (2019) emphasized the role of quality differentiation in expanding Ecuador's cocoa market share.
d. Comparative Studies: Antriyandarti, E. (2023) compared several producing countries but focused only on RCA, without incorporating RSCA and MSI.

These studies provide valuable insights but are limited by their a single-country focus, bilateral comparisons, or reliance on a single index.

2.4. Research Gap and Hypothesis Development

The literature indicates a lack of multi-country analysis that simultaneously integrates RCA, RSCA, and MSI to assess the competitiveness of cocoa exports. Addressing this gap is crucial for a comprehensive understanding of how Indonesia's performance compares to other major producers. Based on the literature, the hypotheses are formulated as follows:

H1 : There are significant differences in cocoa export competitiveness among Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon.Indonesia shows a declining trend in competitiveness compared to other major exporters.Countries with strong government policy support (e.g., Ghana and Côte d'Ivoire) demonstrate higher competitiveness indices.

2.5. Research Framework

Cocoa is one of the most important commodities in global trade, particularly for major producing countries such as Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon. Among these five countries, the level of competitiveness in exporting cocoa beans to the international market varies. In the context of a continuously evolving global market and increasingly intense competition among countries, each producing nation must understand the strength of its export competitiveness. Therefore, this study employs three main analytical tools, namely Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative

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Advantage (RSCA), and the Market Share Index (MSI). These approaches are used to objectively and systematically measure and compare the export competitiveness of cocoa beans across the five countries. In this research, RCA is applied to determine whether a country has a comparative advantage in cocoa bean exports compared to other commodities. RSCA is then used to address the limitations of RCA, providing more balanced results that allow for direct comparisons across countries. Meanwhile, MSI is utilized to examine the market share, or the proportion of the global market controlled by each country. Through these approaches, this study aims to identify the competitive position of each country, including Indonesia's position relative to its competitors. The findings are expected to provide valuable insights for policy formulation and the development of strategies to strengthen Indonesia's cocoa exports in the international market. The research framework of this study is presented in the following figure:

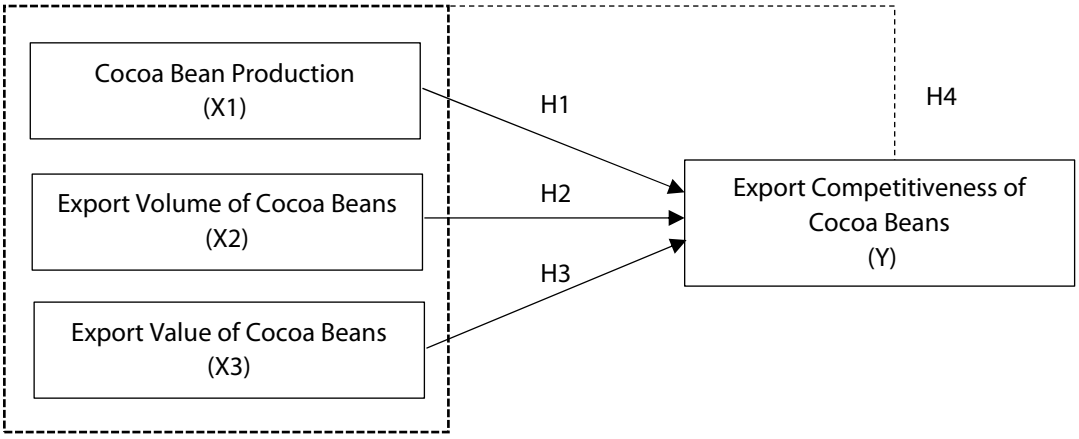

Figure 4. Research Framework of Cocoa Export Competitiveness Study

2.6. Conceptual Framework

The conceptual framework of this study integrates trade theories and competitiveness indices to evaluate Indonesia's position relative to other producing countries. RCA, RSCA, and MSI are employed as key indicators to assess comparative advantage and market performance. The conceptual framework is illustrated in the following figure:

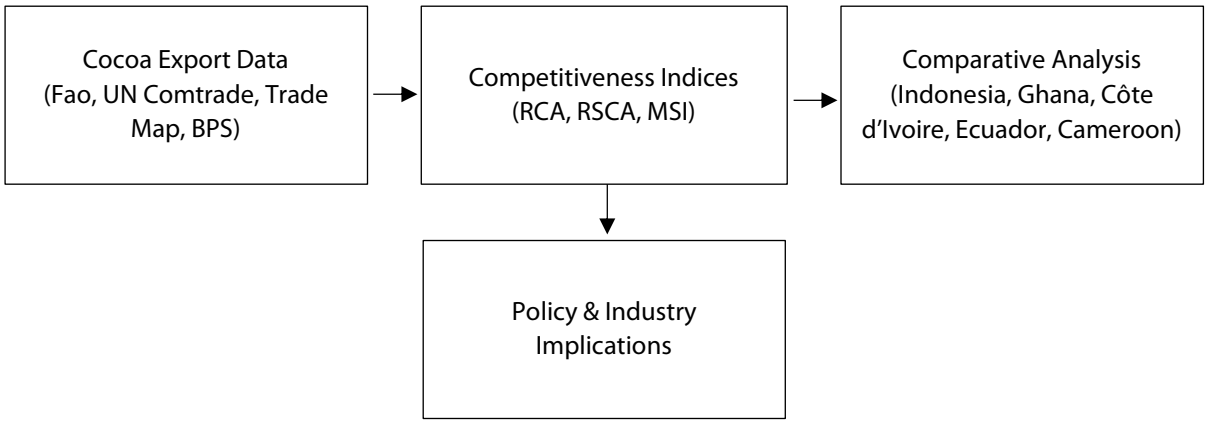

Figure 5. Conceptual Framework of Cocoa Export Competitiveness Study

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2.7. State of The Art (SOTA)

Table 3. Previous Studies on Export Competitiveness

No	Title, Author(s), Year	Variables / Theory / Phenomenon	Key Findings
1	*Perbandingan Daya Saing Crude Palm Oil Indonesia dengan Malaysia di Negara Tujuan Utama Ekspor* (Asrilis Boy Saban & Tanti Novianti, 2023)	Export competitiveness of CPO; Export market share; RCA, RSCA, MSI	Indonesia demonstrates relatively higher competitiveness than Malaysia in key export destinations such as India and China, while Malaysia remains stronger in markets like the Netherlands. Both countries exhibit comparative advantage, but Indonesia's RCA and RSCA values are more stable across major destinations.
2	*Analisis Ekspor Kakao Indonesia di Pasar Internasional* (Muhammad Ridho Al Ghozy, Aris Soelistyo, & Hendra Kusuma, 2018)	Cocoa exports; Trade competitiveness; Trade trends; Trade policy	Industrial downstreaming policies have impacted the export structure, resulting in a rise in processed cocoa exports compared to raw beans.
3	*Analisis Kinerja dan Daya Saing Perdagangan Biji Kakao dan Produk Kakao Olahan Indonesia di Pasar Internasional* (Abdul Muis Hasibuan, Rita Nurmalina, & Agus Wahyudi, 2012)	Cocoa bean exports; Processed cocoa exports; RCA; Constant Market Share (CMS)	Indonesia shows more substantial competitiveness in processed cocoa compared to raw beans. However, RCA results indicate that Indonesia's competitiveness remains lower than that of Côte d'Ivoire and Ghana.
4	*Analisis Komparatif Daya Saing Ekspor Biji Kakao antara Indonesia, Pantai Gading, dan Ghana: Pendekatan RCA dan CMS* (Rizki Vanzza Aji, Zulkarnain Ishak, & Mukhlis, 2017)	Cocoa export competitiveness; RCA; CMS	Indonesia's competitiveness is weaker than that of Côte d'Ivoire and Ghana based on RCA values.
5	*Daya Saing Ekspor Lemak Kakao Indonesia di Pasar Internasional* (Aldianti Nurwansyah, Candra Nuraini, & Dwi Apriyani, 2024)	Cocoa butter exports; RCA; RSCA; Export Competitiveness Index (ECI)	Indonesian cocoa butter exports exhibit a strong comparative advantage with an average RCA of 9.84.
6	*Comparative Analysis of Indonesian Cocoa Competitiveness in the International Market* (D.P.J.I.N. Nisa, D. Darsono, & E. Antriyandarti, 2023)	RCA; RSCA; Export Competitiveness Index (ECI)	Indonesia retains a a comparative advantage in several export markets, but competitiveness remains volatile, underscoring the need for downstream development and enhanced product quality.
7	*Analysis of Competitiveness and Export Trends of Indonesian Cocoa to the Five Destination Countries for 2010–2019* (N.P. Augustin, E. Prasetyo, & S.I. Santoso, 2021)	RCA; Export Competitiveness Index (ECI); Export trends; Market share	Indonesia has relatively strong competitiveness in certain destinations; however, export trends are fluctuating, indicating a need for market diversification and quality enhancement strategies.

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III. Research Methodology

3.1. Research Design

This study adopts a quantitative descriptive approach to evaluate the competitiveness of cocoa bean exports across major producing countries. A quantitative design was chosen to enable systematic measurement and comparison using international trade indices such as RCA, RSCA, and MSI.

3.2. Objects and Scope of Research

The research focuses on five major cocoa-producing and exporting countries: Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon. These countries were selected because they represent the top global exporters with distinct market structures and policy frameworks. Indonesia was chosen as the focal point, while the other four countries serve as benchmarks for comparative analysis.

3.3. Data and Sources

The study relies exclusively on secondary data covering the period 2014–2023. The primary data sources include:

a. Food and Agriculture Organization (FAO)
b. United Nations Comtrade Database (UN Comtrade)
c. International Cocoa Organization (ICCO)
d. Badan Pusat Statistik (BPS, Statistics Indonesia)
e. Trade Map (ITC)

Data collected includes annual production volumes, export volumes, export values, and market shares of cocoa beans.

3.4. Analytical Tools

The data were processed using Microsoft Excel 2019 for descriptive analysis, index computation, and graphical visualization. RCA, RSCA, and MSI values were calculated manually with formula applications in Excel to ensure transparency and replicability.

3.5. Analytical Methods

Basri & Munandar (2010) state that in evaluating the comparative advantage of an export product, the following equation can be applied:

$$\mathrm{RCA} = \frac{(\mathrm{X_{ij}}/\mathrm{X_{it}})}{(\mathrm{X_{wj}}/\mathrm{X_{wt}})}$$

Where:

- X_{ij}: Export value of commodity j from country i
- X_{it}: Total exports of country i
- X_{wj}: Total world exports of commodity j
- X_{wt}: Total world exports of all commodities

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Based on this formula, if the RCA value is greater than one (RCA > 1), the country is considered to have a comparative advantage in that product. Conversely, if the RCA value is less than one (RCA < 1), it indicates the absence of a comparative advantage. After determining RCA, the Revealed Symmetric Comparative Advantage (RSCA) is calculated to compare the competitiveness of cocoa bean exports between Indonesia and the other four major producing countries. RSCA is calculated using the following equation:

$$\text{RSCA} = \frac{(\text{RCA} - 1)}{(\text{RCA} + 1)}$$

According to this formula, RSCA values range between -1 and 1. If the RSCA value is greater than zero (RSCA > 0), the exported product is considered to have strong competitiveness. Conversely, if the RSCA value is less than zero (RSCA < 0), the exported product is considered to lack competitiveness. Subsequently, a Market Share Index (MSI) analysis is conducted to measure the market share of cocoa beans in the global market between Indonesia and the other four central producing countries. According to Ibrahim (2015), market share represents the percentage of a company's (or country's) control over the total market (market segmentation) for a given product. The analysis of market share serves several functions: measuring the exporter's (Indonesia's) market scale, assessing the level of success (market penetration), and serving as an evaluation tool for Indonesia's cocoa bean trade performance. MSI is calculated using the following equation:

$$\text{MSI} = \frac{X_{ij}}{X_{wj}}$$

Where:

- X_{ij}: Export volume of commodity j from country i
- X_{wj}: Total world export volume of commodity j

The larger the MSI value, the greater the market share of a company or country for a particular commodity. Conversely, the smaller the MSI value, the lower the market share of that company or country for the respective commodity (in this case, cocoa beans).

3.6. Research Procedure

The research procedure consists of the following steps:

a. Collection of production and trade data (2014–2023) from FAO, UN Comtrade, BPS, and Trade Map.
b. Organization and cleaning of data for consistency.
c. Calculation of RCA, RSCA, and MSI for each country annually.
d. Comparative analysis across countries and identification of trends.
e. Interpretation of results in relation to trade theory and previous studies.

IV. Literature Review and Hypothesis Development

4.1. Analysis Results

This chapter presents the results of data analysis conducted to examine the export competitiveness of cocoa beans from the five leading producing countries, namely Indonesia, Ghana, Côte d'Ivoire, Ecuador, and Cameroon. The analysis employs three quantitative approaches: Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), and the Market Share Index (MSI). The data analyzed comprises production volume, export volume, and export value of cocoa beans in each country during the period 2014–2023, obtained from credible sources such as Trade Map and the Food and Agriculture Organization of the United Nations (FAO). The purpose of this analysis is to depict the competitive position of

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each country in the international cocoa market and to identify trends and patterns of competitiveness over the past decade. The analysis results are presented in the form of tables, figures, and descriptive narratives to facilitate interpretation. Furthermore, this chapter discusses production dynamics and fluctuations in export values. Accordingly, this chapter constitutes a central part of addressing the research questions and testing the hypotheses formulated in the preceding chapter.

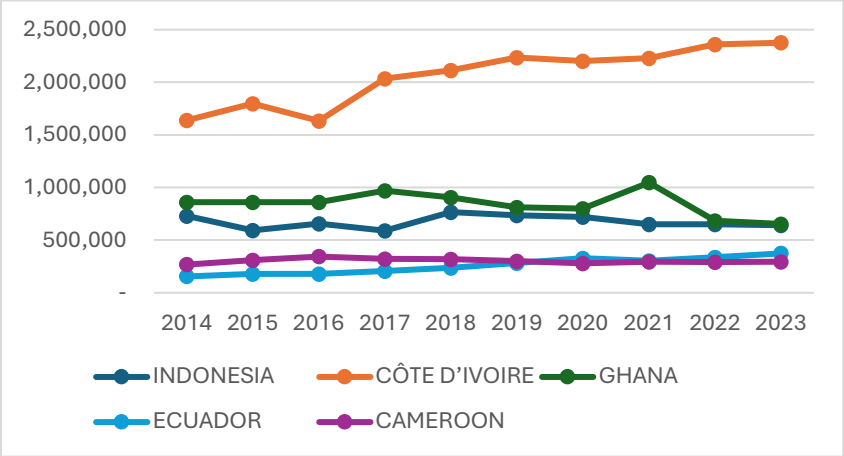

Figure 6. Cocoa Bean Production in Major Producing Countries

Source: Food and Agriculture Organization: Cocoa (2014-2023), authors' calculation.

Indonesia's cocoa production shows a fluctuating yet declining trend, decreasing from 728,400 tons in 2014 to 641,741 tons in 2023, with a peak of 767,280 tons in 2018. The decline is primarily attributed to structural challenges, including the dominance of smallholder farmers with limited capital, insufficient replanting efforts, and restricted access to technology and training programs (BPS, 2024). In comparative terms, Indonesia has gradually lost its position in the global cocoa hierarchy, falling behind Côte d'Ivoire, Ghana, and Ecuador, and only remaining slightly above Cameroon in terms of production volume. Côte d'Ivoire, as the world's largest cocoa producer, experienced continuous growth, from 1.63 million tons in 2014 to 2.38 million tons in 2023. This expansion is supported by government policies, including fixed producer prices, investment in agricultural infrastructure, and plantation expansion (Dago & Pei, 2025). In contrast, Ghana recorded a production decline from 858,720 tons in 2014 to 653,700 tons in 2023. Contributing factors include the spread of the cocoa swollen shoot virus, illegal mining activities (galamsey) that degraded farmland, climate change–induced irregular rainfall, and an aging farming population without sufficient generational renewal (Dormon et al., 2004).

Despite the decline, Ghana's production still surpasses Indonesia's, underlining Indonesia's relative weakness in sustaining competitiveness. Ecuador demonstrated a steady increase in cocoa production, rising from 156,215 tons in 2014 to 375,719 tons in 2023. The growth was driven by replanting programs, the the adoption of sustainable farming practices, and diversification of the export market. As the leading producer of fine-flavor cocoa, Ecuador benefited from rising global demand for premium-quality cocoa. Its production surge allowed Ecuador to overtake Indonesia in recent years, further reducing Indonesia's global ranking (Avadí et al., 2023). Cameroon's cocoa production fluctuated but overall rose slightly from 269,228 tons in 2014 to 295,819 tons in 2023. However, the sector remains constrained by political instability, particularly armed conflict in the Southwest and Northwest (the Anglophone crisis), as well as illegal cross-border trade to Nigeria that undermines official production and export volumes (The Farmer's Journal Africa, 2023). Indonesia still produces more cocoa than Cameroon, but the margin has narrowed.

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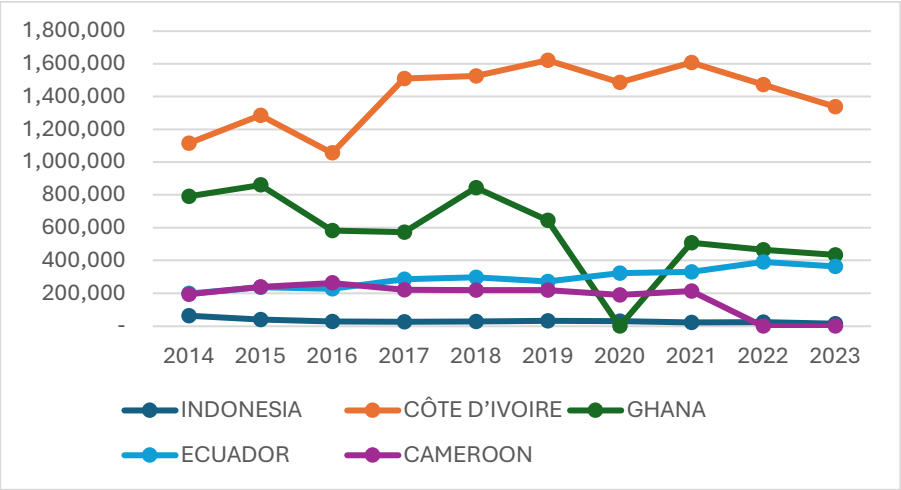

Figure 7. Cocoa Bean Export Volume of Indonesia, Côte d'Ivoire, Ghana, Ecuador, and Cameroon to the World

Source: Trade Map (2014-2023), authors' calculation.

Indonesia's cocoa bean exports have experienced a sharp decline, dropping from 63,334 tons in 2014 to only 14,451 tons in 2023, a reduction of more than 77%. This downturn is driven by multiple structural challenges, including pest infestations such as Phytophthora palmivora (black pod disease), aging cocoa trees with an average age exceeding 20 years, and land conversion to more profitable crops such as oil palm. Additionally, government policy imposing high export taxes to encourage domestic processing has further reduced the competitiveness of raw bean exports (ICCO, 2023). In contrast, Côte d'Ivoire remains the global market leader, with average exports exceeding 1.3 million tons per year, despite temporary declines in 2016 and 2020. The 2016 decrease was attributed to prolonged El Niño–induced drought, while the 2020 decline resulted from a temporary export ban aimed at stabilizing domestic prices. Nevertheless, Côte d'Ivoire maintains its dominant position due to vast plantation areas and consistently high productivity (Cocoa Barometer, 2022). Ghana, the second-largest exporter, recorded fluctuating export levels, peaking at 861,216 tons in 2015 before declining sharply to 433,288 tons in 2023. This decline is linked to irregular weather patterns, the spread of the swollen shoot virus, and government restrictions on raw bean exports aimed at stimulating the domestic processing industry (Ghana Cocoa Board, 2023).

Ecuador shows a contrasting trajectory, with exports rising steadily from 198,890 tons in 2014 to 391,727 tons in 2022—nearly doubling within eight years. This success is primarily driven by heavy investment in premium Arriba Nacional varieties, increasing adoption of sustainable farming practices, and growing demand for fine-flavor cocoa in international markets (USDA, 2023). Cameroon, by comparison, demonstrates stagnation with exports averaging around 200,000 tons in most years. Constraints include poor transport infrastructure, reliance on smallholder farmers with low productivity, and competition from alternative crops such as coffee and rubber. However, initiatives from the World Cocoa Foundation and the national government have begun to improve bean quality and market access, particularly in the European Union (Cameroon Cocoa Development Corporation, 2020). Position of Indonesia Compared to its competitors, Indonesia has fallen significantly behind. While once a notable exporter in Asia, its declining raw bean exports now place it far below Côte d'Ivoire, Ghana, and Ecuador, and only slightly above Cameroon. This shift highlights Indonesia's transition from a raw bean exporter to a country increasingly reliant on downstream processing industries, though at the cost of reduced competitiveness in global cocoa bean markets.

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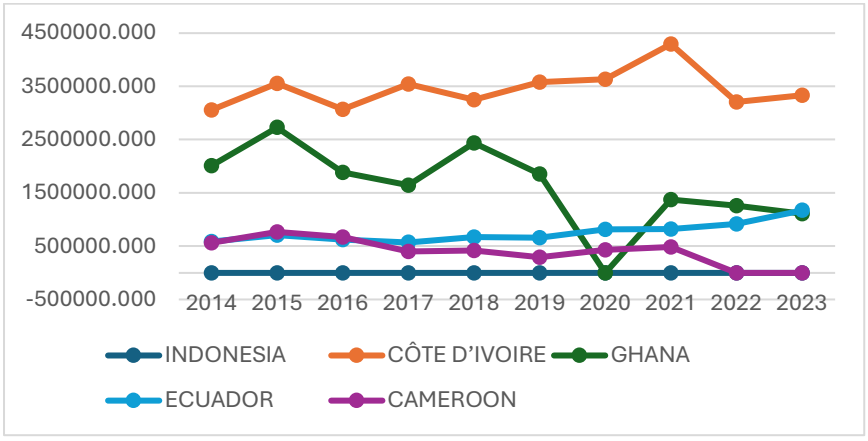

Figure 8. Cocoa Bean Export Value (US$) of Indonesia, Côte d'Ivoire, Ghana, Ecuador, and Cameroon to the World

Source: Trade Map (2014-2023), authors' calculation.

Indonesia experienced a significant decline in cocoa bean export value from 2014 to 2023. In 2014, the export value reached USD 196,492, but it consistently decreased to USD 46,917 by 2023. Unlike other producers, this decline followed a continuous downward trend rather than fluctuating movements. The main factor driving this decline is the shift in Indonesia's export orientation from raw beans to semi-finished and processed cocoa products, such as cocoa liquor, cocoa butter, and chocolate (Ministry of Agriculture RI, 2020). Côte d'Ivoire consistently ranked as the world's top exporter in terms of cocoa bean export value. Its annual exports remained above USD 3 billion, peaking in 2021 at USD 4.29 billion. This success is attributed to decisive government intervention, including guaranteed minimum prices for farmers and significant investments in downstream processing industries, which reinforce its dominance in the global cocoa trade (ICCO, 2022). Ghana, another leading producer, recorded high export values in the early period, peaking at USD 2.73 billion in 2015. However, its export earnings gradually declined to USD 1.11 billion in 2023. This downward trend reflects structural challenges in Ghana's cocoa sector, including climate variability, pest and disease outbreaks—particularly the cocoa swollen shoot virus—and production inefficiencies (Ghana Cocoa Board, 2022).

Ecuador presents a contrasting case, with steady growth in export value from USD 587,528 in 2014 to USD 1.17 billion in 2023. This expansion reflects not only increased production but also the premium market positioning of Ecuador's Arriba Nacional (or fino de aroma) variety, which enjoys high international demand (International Trade Centre, 2022). Cameroon showed sharp fluctuations in export value. In 2015, exports peaked at USD 767,181, before plunging to USD 293,015 in 2019. These fluctuations stem from domestic political instability, weak transport and logistics infrastructure, and low farmer productivity due to limited access to technology and financing. Nonetheless, government support programs and international initiatives, particularly from the World Cocoa Foundation, have aimed to improve quality and export resilience (UNCTAD, 2023). Position of Indonesia: Compared to its competitors, Indonesia's cocoa bean export value has declined the most sharply, placing it far behind Côte d'Ivoire, Ghana, and Ecuador. While once a notable exporter, Indonesia now ranks only slightly above Cameroon. This shift reflects Indonesia's structural transition toward exporting processed cocoa products, but also highlights its declining competitiveness in the raw bean segment of the global cocoa market.

Table 4. RCA and RSCA Index of Cocoa Beans in the World's Major Producing Countries

Years	Côte d'Ivoire		Ghana		Cameroon		Ecuador		Indonesia	
	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA	RCA	RSCA
2014	476,86	0,99581	256,50	0,992233	216,335	0,990798	45,23	0,9567	2,21	0,377
2015	422,76	0,99528	296,61	0,99328	282,946	0,992956	57,52	0,9658	1,14	0,067
2016	498,13	0,99599	305,58	0,993477	542,592	0,99632	63,92	0,9692	1	0,002

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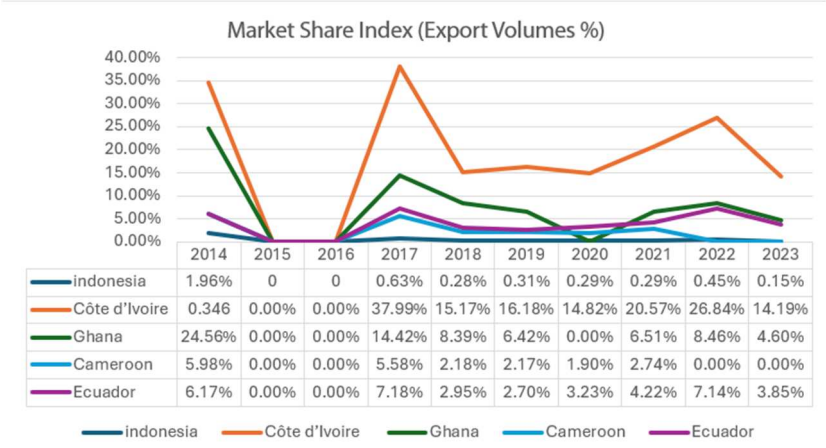
2017	561,20	0,99644	229,97	0,991341	249,044	0,99200	60,35	0,9674	0,64	-0,221
2018	567,95	0,99648	294,16	0,993224	228,066	0,99126	64,22	0,9693	0,83	-0,093
2019	568,57	0,99649	227,18	0,99124	147,59	0,98654	60,55	0,9675	0,99	-0,006
2020	578,72	0,99655	0	0	269,63	0,99261	80,17	0,9754	0,92	-0,041
2021	618,61	0,99677	204,56	0,99027	249,00	0,99200	69,03	0,9714	0,54	-0,301
2022	551,88	0,99638	204,91	0,99029	0	0	73,05	0,9730	0,62	-0,237
2023	433,61	0,99540	156,90	0,98733	0	0	90,04	0,9780	0,43	-0,395

Source: Trade Map (2014-2023), authors' calculation.

Côte d'Ivoire consistently demonstrates a dominant position in cocoa bean exports, with RCA values above 400 throughout 2014–2023 and RSCA scores approaching 1 (ranging from 0.9952 to 0.9967). These indicators confirm Côte d'Ivoire's most substantial comparative advantage among global producers, consistent with its role as the world's largest cocoa supplier (FAO, 2023). Ghana also records very high competitiveness, with RCA values consistently above 200 and an average RSCA exceeding 0.99. Although Ghana's RCA declined to 156.90 in 2023, reflecting reduced export performance relative to total national exports, its overall comparative advantage remains strong (ITC Trade Map, 2023). Cameroon initially achieved high competitiveness, with RCA peaking at 542.59 in 2016 and RSCA values above 0.99 until 2021. However, its competitiveness has weakened in recent years due to political instability, poor transport infrastructure, and declining production capacity (UNCTAD, 2023). Ecuador shows a gradual improvement, with RCA rising from 45.23 in 2014 to 90.04 in 2023, and RSCA ranging between 0.9567 and 0.9780.

Although these figures are significantly lower than those of West African producers, the upward trend reflects Ecuador's successful diversification strategies and enhanced export competitiveness in premium markets (ICCO, 2023). By contrast, Indonesia consistently records the lowest competitiveness. RCA fell from 2.21 in 2014 to only 0.43 in 2023, while RSCA turned negative from 2017 onwards. This indicates that Indonesia has lost its comparative advantage in cocoa bean exports, primarily due to declining production volumes, aging plantations, land conversion to alternative crops, and limited replanting programs (Ministry of Agriculture RI, 2023). Compared with its competitors, Indonesia's RCA and RSCA trends place it at the bottom of global cocoa exporters. While Côte d'Ivoire and Ghana remain dominant, and Ecuador shows steady improvement, Indonesia has shifted away from raw bean exports, underscoring its growing dependence on processed cocoa products rather than maintaining competitiveness in the primary cocoa trade.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
indonesia	1.96%	0	0	0.63%	0.28%	0.31%	0.29%	0.29%	0.45%	0.15%
Côte d'Ivoire	0.346	0.00%	0.00%	37.99%	15.17%	16.18%	14.82%	20.57%	26.84%	14.19%
Ghana	24.56%	0.00%	0.00%	14.42%	8.39%	6.42%	0.00%	6.51%	8.46%	4.60%
Cameroon	5.98%	0.00%	0.00%	5.58%	2.18%	2.17%	1.90%	2.74%	0.00%	0.00%
Ecuador	6.17%	0.00%	0.00%	7.18%	2.95%	2.70%	3.23%	4.22%	7.14%	3.85%

Figure 9. Market share index (MSI) Indonesia, Pantai Gading, Ghana, Ecuador, and Cameroon
Source: Trade Map (2014-2023), authors' calculation.

Indonesia recorded a very low share of cocoa bean exports during 2014–2023. Its highest share was only 1.96% in 2014, but it consistently declined to below 1% in subsequent years. By 2023, Indonesia's export share fell to just 0.15%, reflecting a very weak position in the global cocoa market. The persistently low MSI indicates Indonesia's limited contribution to the international cocoa trade and its declining competitiveness in raw bean exports. Ghana initially held a substantial export share of 24.56% in 2014, positioning it as one of

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the leading global players. However, its share gradually declined, reaching 4.60% in 2023. Despite this downward trend, Ghana remains one of the largest exporters, although its relative weight in the global cocoa trade has diminished due to production and structural challenges. Côte d'Ivoire consistently dominated global cocoa bean exports, with a share of 34.60% in 2014, rising to 37.99% in 2017. Although its share declined in later years, the country still accounted for 14.19% in 2023, reinforcing its status as the global leader in cocoa exports. This dominance reflects the scale of production and the global market's reliance on Ivorian cocoa.

Ecuador showed a relatively stable yet fluctuating export share, ranging between 2% and 7% during 2014–2023. Its peak occurred in 2022 at 7.14%, before declining to 3.85% in 2023. While smaller than Côte d'Ivoire and Ghana, Ecuador has maintained a competitive presence, particularly through its niche market for premium fine-flavor cocoa. Cameroon held a moderate share in global cocoa exports, peaking at 5.98% in 2014 before gradually declining to between 1.90% and 2.74% during 2018–2021. Although recent data for 2022–2023 are unavailable, Cameroon continues to contribute as a medium-level exporter despite structural limitations. Position of Indonesia, Compared with its peers, Indonesia's MSI is the lowest and has declined most sharply, indicating a loss of competitiveness in the raw cocoa bean segment. While Côte d'Ivoire and Ghana dominate through volume, and Ecuador builds strength in premium markets, Indonesia has shifted away from raw bean exports, reflecting its policy emphasis on downstream cocoa processing.

V. Conclusion

This study analyzed the competitiveness of cocoa bean exports in Indonesia, Côte d'Ivoire, Ghana, Ecuador, and Cameroon using RCA, RSCA, and MSI indicators for the period 2014–2023. The key findings can be summarized as follows:

a. Côte d'Ivoire and Ghana remain the dominant cocoa exporters worldwide, with consistently high RCA values (ranging between 200–400) and RSCA values close to 1. Government interventions, large-scale plantations, and stable productivity support their strong performance.
b. Ecuador demonstrates a significant upward trend in both production and export competitiveness. Its RCA nearly doubled between 2014 and 2023, reflecting success in penetrating premium cocoa markets such as Arriba Nacional.
c. Cameroon shows moderate competitiveness. Initially strong, its performance has declined in recent years due to political instability and weak infrastructure.
d. Indonesia records the weakest performance among the five countries. Its RCA fell from 2.21 in 2014 to 0.43 in 2023, RSCA values have been negative since 2017, and MSI declined from 1.96% to 0.15%. These results indicate a loss of comparative advantage in raw cocoa bean exports.
e. The decline in Indonesia's raw cocoa competitiveness can be attributed to several structural issues, including aging plantations, limited replanting programs, pest and disease infestations, land conversion, and government policies that prioritize processed cocoa exports over raw beans.

In conclusion, Indonesia has lost its position as a major cocoa bean exporter. It now lags far behind Côte d'Ivoire, Ghana, and Ecuador, and only slightly outperforms Cameroon.

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