

MEASURING INDONESIAN COCOA AGROINDUSTRY COMPETITIVENESS FROM A GLOBAL VALUE CHAIN PERSPECTIVE

Pengukuran Daya Saing Agroindustri Kakao Indonesia dari Perspektif Rantai Nilai Global

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Abstract

Indonesian cocoa products in international trade face challenges in quality, food safety, and environmental requirements. Developing the cocoa agro-industry is essential to meet those global demands. The research aims to analyze the competitiveness of business in Indonesian cocoa products using the Global Value Chain (GVC), Revealed Comparative Advantage (RCA), and Trade Specialization Index (TSI) methodology. Research data uses the time series of Indonesian cocoa product export trade from 2001-2020. From a GVC perspective, the diversity of cocoa product exporters and the same competition drive a significant increase in competitiveness. Market access opportunities and regulatory support will encourage domestic industrial growth by utilizing efficient supply chains and making Indonesia part of the global production network. Cocoa products require economic value, from dry beans to ready-to-consume products. They are improving farmer's bargaining position towards agro-industry institutions and better stakeholder coordination. The results of RCA show the comparative advantage of Indonesia cocoa exporters for HS code products 1801, 1802, 1803, 1804, and 1805 in the international market. The stages of identification of Indonesian cocoa products are the maturity stage for cocoa beans, the commercial maturity stage for cocoa paste and butter products, and the growth stage for cocoa product powder.

Keywords: *Competitiveness, Global Value Chain, Indonesian Cocoa Product, Revealed Comparative Advantage, Trade Specialization Index*

Abstrak

Produk kakao Indonesia menghadapi tantangan terkait persyaratan mutu, keamanan pangan, dan lingkungan di pasar internasional. Pengembangan agroindustri kakao sangat penting untuk menjawab ini. Penelitian bertujuan menganalisis daya saing perdagangan produk kakao Indonesia dengan pendekatan *Global Value Chain (GVC)*, *Revealed Comparative Advantage (RCA)*, dan *Trade Specialization Index (TSI)*. Data Penelitian menggunakan *time series* perdagangan ekspor produk kakao Indonesia tahun 2001-2020. Berdasarkan perspektif GVC, keberagaman pengekspor produk kakao dan persaingan yang sama mendorong peningkatan daya saing secara signifikan. Peluang akses pasar dan dukungan regulasi akan mendorong pertumbuhan industri dalam negeri dengan memanfaatkan rantai pasok yang efisien dan menjadikan Indonesia bagian jaringan produksi global. Produk kakao memerlukan nilai ekonomi, mulai dari biji kering hingga produk siap konsumsi. Hal ini bertujuan untuk meningkatkan posisi tawar petani terhadap kelembagaan agroindustri dan koordinasi antarpemangku kepentingan yang lebih baik. Hasil RCA kakao Indonesia menunjukkan keunggulan komparatif eksportir kakao untuk produk kode HS 1801, 1802, 1803, 1804, dan 1805 di pasar internasional. Tahapan identifikasi produk kakao Indonesia berada pada tahap

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kematangan untuk biji kakao, tahap kematangan komersial untuk produk pasta dan mentega kakao, serta tahap pertumbuhan untuk bubuk produk kakao.

Kata kunci: Daya Saing, Rantai Nilai Global, Produk Kakao Indonesia, *Revealed Comparative Advantage, Trade Specialization Index*

JEL classification: F23, L16, L23, M11

INTRODUCTION

Cocoa is one of Indonesia's potential commodities, which has experienced a downgrade as the third largest cocoa bean-producing country in international trade. Starting from 2016, it decreased to fourth position. Since 2018, Indonesia has been in seventh place, with total production in 2020 reaching 220,000 tons (ICCO, 2021). The issue of food security befalls international trade in cocoa as a technical trade barrier, trends in environmental issues, and possible causes for Indonesia's position as a cocoa-producing country to decline.

On the other hand, the Indonesian government supports the cocoa agroindustry as a food and beverage industry group, which is included in the priority scale in the Indonesian National Industrial Development Master Plan Book for the 2015-2035 period (Kemenperin, 2015). The cocoa product processing industry is an industry that has the potential to be developed to answer the global demand for cocoa product consumption. According to

world trade data on the cocoa processing industry, cocoa derivative products produced in Indonesia are mainly intermediate products such as cocoa liquor/mass, butter, cake, and powder. Based on data from the Statistics Indonesia (BPS) in 2019, most of these products were exported with a volume of 285,786 tons (81 percent), and only 68,190 tons were marketed domestically (19 percent). By understanding cocoa statistical data, we can use the Global Value Chain (GVC) approach for more in-depth tool analysis. This approach allows us to depict and assess each step in the cocoa value chain, from production to final consumption. We may use the GVC approach to conduct a more thorough tool analysis by better understanding the statistical data related to cocoa. With this method, we can illustrate and evaluate every stage of the cocoa value chain, from the point of production to the point of consumption.

Value chain analysis is an analytical tool that can inform strategic

decisions in dealing with business competition (Gereffi & Fernandez-Stark, 2016). The GVC approach uses the value chain as an organizational structure to visualize industrial studies that cover all production and service activities (Li et al., 2019), from planning to final use (Tien et al., 2019). The GVC approach provides a conceptual framework for describing, understanding, and managing the value chains of multinational corporations (Anderer et al., 2020) that are increasingly dispersed and geographically dispersed (De Marchi et al., 2014). GVC leads to a separation of production processes in the world. Therefore, to develop the role of Indonesian processed cocoa in the GVC to become products that are reckoned with in the international market, it is necessary to study the potential of the Indonesian cocoa agroindustry from a GVC point of view.

The GVC study of cocoa products should be carried out to identify all value chain elements at the 6-dimensional GVC stage. Most of the GVC dimension categories from other studies only consider the potential for governance, upgrading, ICIO, and geography. This study considers additional dimensions, as Table 1 shows the literature regarding

the categories and scopes used in GVC studies of Indonesian products. In several studies related to GVC, most only consider governance potential, improvement, ICIO and geographic scope. Based on literature studies related to GVC with governance scope on cocoa products (Nabhani et al., 2015), footwear products (Goni & Kadarusman, 2015), geographic coverage on coffee (Fadillah et al., 2019), Upgrading scope on coffee (Vicol et al., 2018a) and upgrades in electronics & garments (Kadarusman & Nadvi, 2016), Inter-Country Input-Output (ICIO) in pulp & paper (Ahmad et al., 2018) and GVC studies that examine more it has many scopes, namely governance, improvement, and local policy networks on yarn products (Nugroho, 2022). In this study, the GVC study of cocoa products considers six dimensions of GVC so that all value chain elements can be identified.

The competitiveness of cocoa products is analyzed to ensure suitable types of cocoa products to be traded on the international market. The aim is to assess export performance (Ermawati & Saptia, 2013) for cocoa and processed products. Revealed Comparative Advantage (RCA) analysis was performed to determine comparative

advantage (Balassa, 1965). The assumption is that trade between countries has a comparative advantage (Wellyanti, 2015). The various trades of cocoa products require the identification of the developmental phases of the types of cocoa products so that they are ready for export in the international market. Even though Indonesia is one of the world's largest producers of cocoa beans, the primary raw material for chocolate, Indonesia is not well known for chocolate products. So, it is necessary to measure the competitiveness of cocoa in world trade to see the existence of this gap. What are the facts on the ground? What needs to be explored according to the facts on the ground? What policies need to be focused on so that they can fill the gap?

This study aims to analyze the competitiveness of trade in Indonesian cocoa products in the international market using the GVC approach,

ascertain the types of cocoa products developed through the calculation of the RCA method, and identify the stages of growth of cocoa products in international trade through the Trade Specialization Index (TSI).

METHOD

This study collects data on exports, imports, production, and plantations. The data is in the form of a data series from 2001-2020. Data sources were obtained from United Nations (UN) Comtrade data, Trade Map, ICCO, Ministry of Agriculture and Plantation data, and Global Competitiveness reports. Sources were obtained from the United Nations (UN) Comtrade, Trade Map, ICCO, Ministry of Agriculture Plantation data, and Global Competitiveness reports. Another source of information was obtained from literature studies. The stages of the research can be seen in Figure 1.

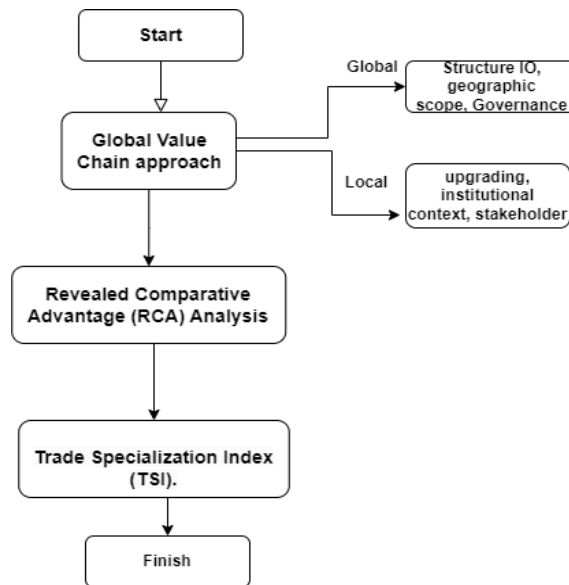


Figure 1. Framework of Research

Global Value Chain (GVC)

The first objective of this study is to conduct a qualitative analysis through the GVC approach to the cocoa agroindustry. The GVC approach has two perspectives: global (top-down) and local (bottom-up). On the global side, determined by industry dynamics at the global level, there are three

dimensions: input-output structure, geographic scope, and governance structure. In comparison, the local perspective describes how each country participates in GVC (Figure 2) and has three dimensions: improvement, institutional context, and stakeholders (Fernandez-Stark & Gereffi, 2019).

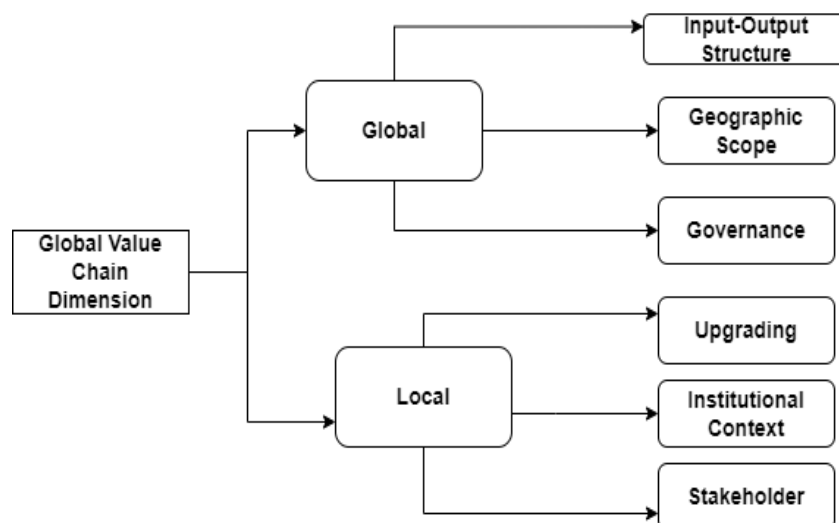


Figure 2. Dimension of Global Value Chain

Competitiveness Cocoa Agroindustry Indonesia

The second objective is to conduct a quantitative analysis using a mathematical approach to measure the potential of Indonesian cocoa products in the global market. To measure the competitiveness of cocoa agroindustry products by calculating RCA and TSI.

Revealed Comparative Advantage (RCA)

RCA is a method that can measure the relative position of a superior country in the world market (Prasada & Dhamira, 2021). Based on their comparative advantage, this study calculates the RCA of several traders of cocoa beans and processed cocoa products. The RCA Mathematical Model developed by (Vollrath, 1991) in general is as follows:

$$RCA = \frac{X_{ij}/X_j}{X_{iw}/X_w} \text{ or } RCA = \frac{X_{ij}/X_{iw}}{X_j/X_w} \dots\dots (1)$$

- x_{ij} : Export value of commodity i from country j
- x_j : Total export value of country j
- x_{iw} : Export value of commodity i from the world
- x_w : Total world export value

RCA rating based on (Budiarti & Anggraeni, 2023), if RCA value > 1 , the product has a comparative advantage above the world average. If RCA value

< 1 , then the product has a comparative advantage below the world average.

The higher the RCA value, the more the product's comparative advantage. Meanwhile, if the RCA value is smaller than 1, the country does not have a comparative advantage.

Trade Specialization Index (TSI)

TSI measures the developmental position of a product that tends to an exporting or importing country (Hanafi & Tinaprilla, 2017). The TSI will identify a product's growth level in international trade. The stages of product development based on TSI are:

- 1) Preliminary stage, between -1 to -0.50
- 2) Stage of import substitution, between -0.51 to 0.00
- 3) Stage of Growth, between 0.01 to 0.80
- 4) Stage of Maturity, between 0.81 up to 1.00
- 5) The stage of re-importing if the value of the TSI back down from 1.00 to 0.00

Mathematically, TSI has a formula as follows:

$$ISP = \frac{X_{it} - M_{it}}{X_{it} + M_{it}} \dots\dots\dots (2)$$

- x_{it} : Export value of product i in year t
- M_{it} : Import value of product i in year t

RESULT AND DISCUSSION

Global Value Chain Perspective

a. Input-Output Structure

The GVC approach is this study's first goal, which ascertains how to regulate global industries by studying the structure and dynamics of various stakeholders in a particular region (Fernandez-Stark et al., 2011). The input-output structure is carried out by identifying the main activities of the cocoa agroindustry in the GVC. Describes converting raw materials into final products, covering all supply chain segments and value-added activities (research), design, marketing, and support services. The input-output structure begins with determining the main activities to be carried out (from providing input to finished output for the final consumer), determining the actors involved in each process (main activities), and mapping the product flow of each process to describe the product in its entirety.

Cocoa agroindustry is a system that involves at least three main actors, namely producers or farmers, marketers or traders, and consumers. Consumer behavior manifested in consumption patterns will determine the quality and quantity of products marketed (Hubacek et al., 2007). The pattern of production

carried out by farmers will determine the number of products that can be marketed (Krugman, 1980). Production patterns are generally influenced by climatic conditions and other factors that affect farmers' production activities (Wahyunadi & Akung, 2012). All parties that directly or indirectly meet consumer needs are included in the cocoa supply chain. Manufacturers, suppliers, operators, warehouses, retailers, and customers are part of the supply chain (Chopra & Meindl, 2013). Cocoa supply chain activities include cocoa plantations, harvesting, splitting cocoa pods, fermentation, drying, shipping to the cocoa product industry, distribution to retailers, and consumer production (Fowler & Coutel, 2017). The production model links multilateral activities with stakeholders in the same sector and clarifies global roles. The supply chain in the structure of output and input is often achieved in the countries involved in the industry by taking advantage of competitive forces. (Ernita & Ampuh Hadi Guna, 2017) Organizations and governments increasingly adopt this methodology to understand various levels of global industries. Figure 3 illustrates the input-output structure of the Indonesian cocoa agribusiness industry (Nussy et al., 2022).

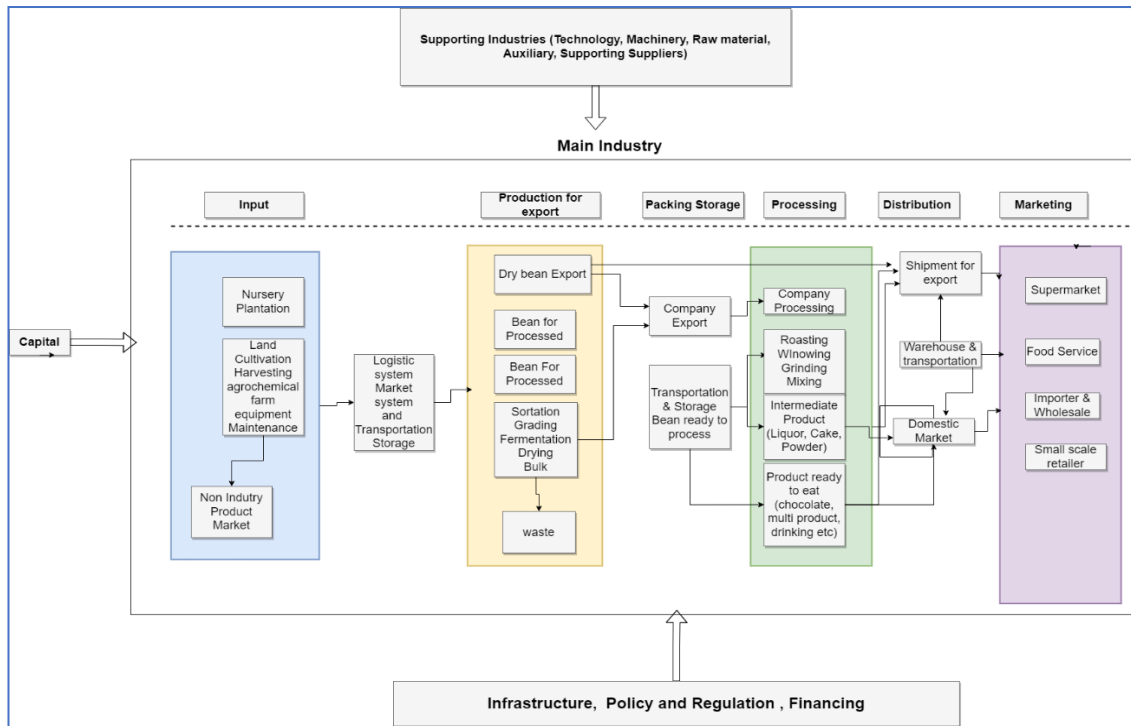


Figure 3. Cocoa Agroindustry Supply Chain-Farmers to Consumers

Each stage has different characteristics and dynamics, such as procuring certain raw materials or selecting suppliers. In the export cocoa agroindustry, the input for the production stage comes from cocoa beans. There is a food safety issue in Indonesian cocoa beans, so the quality of the beans greatly determines the trade volume of Indonesian cocoa beans. Soil conditions, maintenance, use of fertilizers and pesticides, and garden maintenance influence the input phase. The second phase is at the crop production stage, producing dry cocoa beans. Cocoa beans undergo fermentation and non-fermentation processes, sorting, drying, and grading.

There are two types of cocoa bean products: dry ones ready for export and those distributed for processing to manufacture.

In the third phase of the processing stage, there are two types of products to be processed, namely intermediate products that are ready to be used by other industries, such as cocoa butter, cocoa liquor, cocoa powder, and ready-to-eat products such as chocolate, chocolate drinks, and other chocolate-based products. At the processing stage, apart from trying to meet consumer tastes, the industry must also meet the requirements for a good production process and the final product according to quality standards. In the

cocoa agroindustry in Indonesia, the requirements for cocoa products as part of the food industry are fulfilled with the Hazard Analysis Critical Control Point (HACCP) and Good Manufacturing Practice (GMP) systems according to the National Agency of Drug and Food Control or Badan Pengawas Obat dan Makanan (BPOM) standards, certification according to certification product based on Standard National Indonesia (SNI) for cocoa powder, and Sistem Jaminan Produk Halal (SJPH) certification.

In the distribution phase, shipment activities are for exported products and products distributed to other industries for domestic use. Meanwhile, in the market phase, apart from the export market, the GVC is also used for the domestic market, such as retail, coffee shops, and cafes.

The input-output structure in the Indonesian cocoa GVC includes the flow of cocoa beans from farmers to processing and distribution. Processes such as harvesting, drying, fermenting, and packaging cocoa beans are included in this process flow. The

efficiency and effectiveness of this process determines the final quality of the cocoa product.

b. Geographical Coverage

Geography scope in the GVC, according to (Rodrigue, 2012), consists of the geography of production, distribution, and consumption. Based on 2020 International Cocoa Organization (ICCO) statistical data, Indonesia, in terms of production geography, is a supplier of raw materials for cocoa beans in the world's supply chain. Indonesia has very suitable land for cocoa plantations. Statistical data from the Statistics Indonesia (BPS) in 2020 shows that Indonesian cocoa plantations have an area of around 1.7 million hectares spread from Aceh to Papua. Smallholders own 95 percent of Indonesian cocoa plantations. In the cocoa agroindustry, the farmer is a supplier who works closely with exporters or with manufacturers. Figure 4 describes data on production land for Indonesian cocoa plantations based on data from the Ministry of Agriculture.

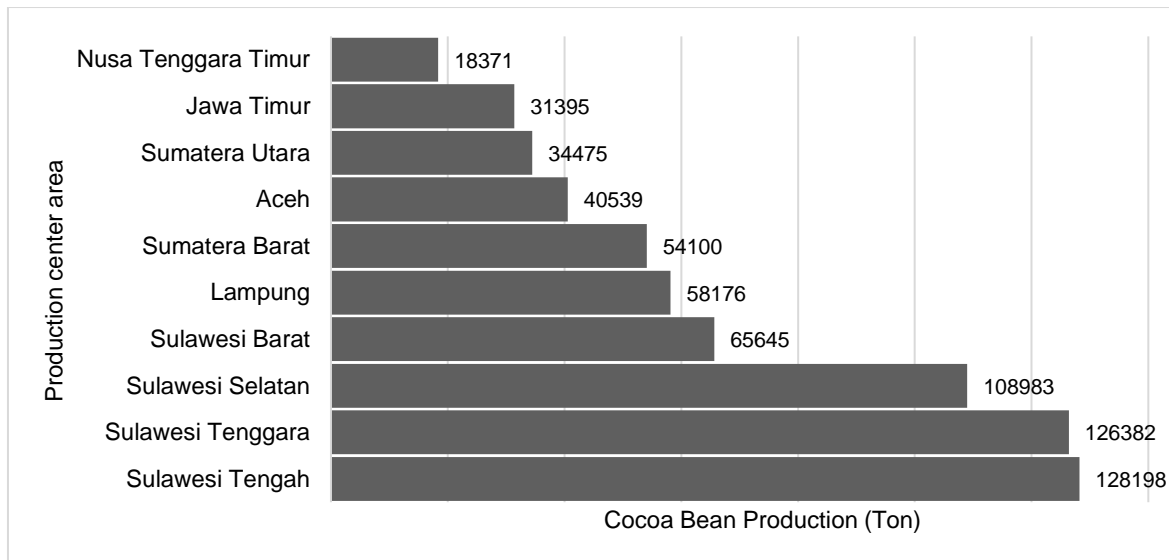


Figure 4. Cocoa Production Area in Indonesia

Source: The Ministry of Agriculture's (2020), processed.

On the other hand, the distance between cocoa-producing countries and importing countries is very far. Indonesia has a farther distance to Europe, for example, when compared to Ghana-Africa, which is also a cocoa-producing country. The opportunity to establish an industry in raw material-producing countries is the reason for the existence of multinational companies. Establishing a multinational company in GVC is based on production, land, labor, and capital factors. Multinational companies in Indonesia are already engaged in cocoa processing. It is essential to ascertain the type of cocoa processing industry involved and the characteristics of the business scale, such as global or domestic, large, medium, or small. Geography by distribution in the cocoa

agroindustry still utilizes shipments to deliver raw materials for exported cocoa beans. Mileage can be shortened to reduce emissions, which is considered in the sustainability analysis.

From consumption geography, the cocoa product is a product that is consumed when the product is ready to eat. Cocoa is one of the refreshing ingredients for plantation commodities, but culturally, consumption patterns affect production. Indonesian people do not consume cocoa products every day, unlike other refreshing products, such as coffee and tea, which are consumed daily. So, processed cocoa products are consumed by countries that regularly consume them, such as Europe.

In cocoa production, geography plays an important role. Indonesia has a

tropical climate ideal for growing cocoa beans, and regional variations in climate and soil conditions influence the characteristics of cocoa beans. Integrating smallholder farmers in different regions into GVCs is essential to ensure consistent and sustainable supply.

c. Governance

Governance is described as 'buyer-based' or 'producer-driven' governance. Governance in GVC explains how a company controls the value chain. So, there will be concerns about the strength and ability of the company (or organization or institution) to exercise control along the value chain. According to (Miranda et al., 2020), governance is based on 'buyer-based' or 'producer-driven' governance.

Indonesia's cocoa agroindustry is seen from the management into producer-driven governance, where supply chain dynamics driven by producers are more vertically integrated along all supply chain segments, utilizing integrated technology or suppliers. This governance understands the entry of enterprise development in a global industry. A cocoa agro-industry company can determine where people operate at any point in the supply chain.

The goal of the supply chain is to maximize the benefits of all supply chain activities. One measure of supply chain success is the quality of coordinated activities at all levels of the supply chain and the increased benefits of each part of the supply chain (Somashekhar et al., 2014).

Vertical coordination involves exchanging information related to product design, process control, and time between companies (Mithöfer et al., 2017). Sometimes, sector-specific factors also hinder the involvement of entrepreneurs in global production networks. Non-tariff barriers, such as food safety and sustainability issues, are still sector-specific factors in the cocoa agroindustry. There are difficulties in meeting international product standards and obtaining quality raw materials under global consumer demands. Coordination of all parties is needed so that the quality of Indonesian cocoa beans meets the standards, departing from cocoa farmers' understanding of the importance of cocoa quality in international trade. If the quality of cocoa beans meets global standards, it is necessary to minimize the possibility of defective beans so that exports do not experience automatic detention. The cocoa agroindustry has farmers who are

small suppliers who depend on several buyers/industries, where the industry level monitor and control. The governance of the cocoa agroindustry, according to Fernandez (2019) includes captive-type governance; suppliers are encouraged to increase their production capabilities by the primary industry to increase the efficiency of their supply chain.

Governance includes the policies, standards, and practices that govern the cocoa industry, such as quality standards, sustainability certification, and trade policies. Farmers, processors, exporters, and the government must work together to ensure good governance. The second set of dimensions consists of scale-up, institutional context, and stakeholders that describe how each country participates in GVC.

d. Upgrading

Describes how producers develop between different stages (Fernandez-Stark and Gereffi 2019) and discusses the strategies countries and other sectors use to improve their position in the global economy. Upgrading is a strategy and effort made by all relevant stakeholders to improve value chain activities to obtain more significant

benefits from the participation of a product in the GVC. Upgrade refers to the cocoa agroindustry strategy to maintain or increase its position in the global economy. Analysis of upgrading the value chain includes process, product, and function improvements that are useful for increasing the ability of actors to face competition. The coffee study (Vicol et al., 2018b) highlighted that upgrading was carried out in coffee bean-producing communities, namely coffee farmers. GVC analysis in the cocoa industry begins with improving the farmer's process as a supplier of raw materials that consistently produces good quality dry cocoa beans that meet standards, makes better fermentation equipment (Ariyanti, 2017), and adopting more advanced technology and equipment to increase the efficiency of industrial machines cocoa and supporting tools that have developed towards digitalization.

At the product improvement level, efforts to increase the productivity of the cocoa agroindustry include penetrating the Indonesian product market into the global market. The acceptability of Indonesian cocoa products in the global market will depend on the quality of the marketed cocoa (Faisal, 2019). Product compliance with certification, technical

regulations, or standards in destination countries and cocoa farming development is necessary to meet global product quality or function demand. In that case, efforts are made to use higher-quality materials or better-quality management systems.

Currently, non-tariff barriers often used are issues related to quality, food safety, and the environment. Then, in functional enhancements, the company begins to design its products, develop marketing and branding capabilities, and supply directly to end markets or consumers.

There is creativity to revive the branding of Indonesian cocoa products on the worldwide market. Cocoa agroindustry activities aim to provide economic value to a product, from dry beans to ready-to-consume products. Then, it takes a ready-to-sell attractive product according to consumer expectations to achieve economic benefits.

In GVC, increasing capacity and quality is a process. For cocoa, improved farming techniques, better post-harvest processing, and product diversification are some examples of improvements. To improve the quality of cocoa beans, farmers need education and training. On the one hand, digital

transformation is also being experienced by the cocoa agroindustry. Digital transformation is a change to the future (irreversible chain) based on information technology, providing significant benefits for organizations/companies. Digitalization has begun to penetrate from the partner farmer level with various digital applications that connect cocoa farmers with the processing industry and the Internet of Things in the cocoa industry to the distribution and consumer level through the marketplace.

e. Institutional context

The industrial value chain has economic and social elements. Identify how local, national, and international policies and conditions shape globalization at each value chain stage. GVC is embedded in the dynamics of economic, social, and environmental institutions. In carrying out its business processes, institutions in the cocoa supply chain will be interrelated. Changes in one institution can affect other institutions. This linkage must be managed to positively contribute to all supply chain elements and reduce the negative impact on each member. Structuring the institutional system must improve the cocoa agroindustry's

performance, improve farmers' bargaining position, and provide better coordination between stakeholders. Institutional support ensures the smooth running of business processes and

coordination in the quasi-cocoa agroindustry supply chain. Figure 5 describes the Flow Mechanism in the Cocoa Agroindustry.

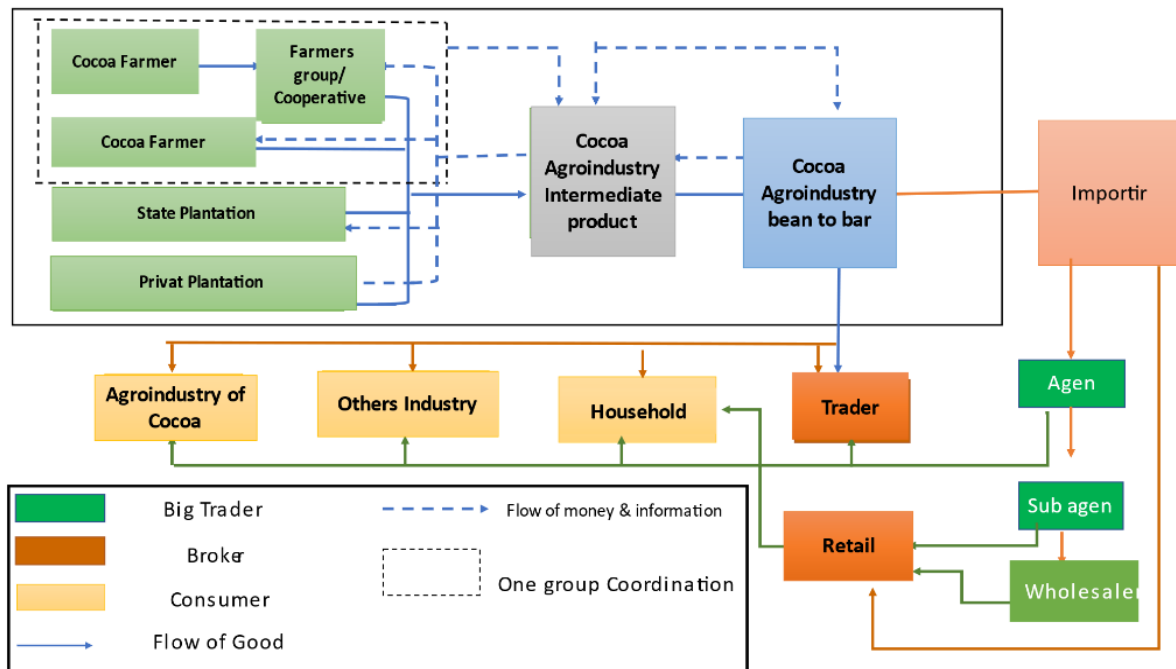


Figure 5. Flow Mechanism in Cocoa Agroindustry

In the social aspect of the cocoa agroindustry, farmer groups, and cooperatives define the quality of cocoa beans. Given the geographical conditions where most of the cocoa plantations are owned by the community, an industrial partnership with farmers has been formed in the cocoa agroindustry. Cooperation that benefits both parties needs to be supported. In an institutional context, GVC comprises cooperatives, farmer associations, and government

institutions. Strong institutions can help farmers with better market access, credit, technology, and price negotiations.

f. Stakeholders

Stakeholders describe various actors who interact to achieve industrial improvement. The global chain approach looks at global industrial settings by studying the structure and dynamics of various stakeholders in a particular region (Fernandez-Stark &

Gereffi, 2019). All industry players are mapped in their primary roles in the supply chain. The Indonesian cocoa agroindustry stakeholders include cocoa farmers, cooperatives, companies, associations, workers, NGOs, and the

government (Syahrudin & Kalchschmidt, 2012). Table 1 shows the mapping of cocoa agroindustry stakeholders and their functions (Nabhani et al., 2015).

Table 1. Mapping Function of Stakeholders of Cocoa Agroindustry

Stakeholder	Function
Government, researcher	Research
Farmer	Plantation; maintenance
Farmer	Supplier cocoa bean
Trader, collector, cooperative	Collecting beans, purchasing Sell to exporter
Export	Buying and selling cocoa beans or products of cocoa
International trader	Export and import
Agroindustry cocoa (local)	Production of intermediate products (cocoa paste, liquor, cake, butter, and powder)
Agroindustry cocoa	Chocolate product
Multinational company	Produce cocoa product

Source: Processing result.

Indonesia has made various efforts to increase domestic cocoa agroindustry production through short-, medium--, and long-term development plans up to 2025. One of them is the regulation regarding obligations according to SNI cocoa powder standards to export raw material to semi-finished products, for example, processing cocoa powder in the cocoa industry to produce semi-finished products (Lestari, 2017). Other regulations related to cocoa products include the obligation to comply with good halal (Hidayat & Siradj, 2015), labels, and GMP standards to fulfil

distribution permits in Indonesia (Wijaya & Rahayu, 2014).

The diversity of exporting countries for cocoa products and the competition for the same export destination countries have encouraged the reorganization of Indonesia's competitiveness, a significant increase in competitiveness. In addition, opportunities for better market access with various regulations will encourage the growth of domestic industry by utilizing more efficient supply chains and making Indonesia part of a global production network or supply chain.

Stakeholders in cocoa GVCs include farmers, processors, exporters, retailers, and consumers. The involvement of all these stakeholders is essential to ensure that the value generated in a GVC is distributed fairly. Ensuring that cocoa farmers are empowered through education, market access, and supportive policies is critical to the industry's sustainability. The existence of partnerships between the cocoa industry and farmers to obtain high-quality cocoa beans can improve Indonesia's position in the cocoa GVC. It improves the final product's quality, supports sustainable economic development, and improves farmer welfare.

Revealed Comparative Advantage (RCA)

The second objective of this study is to analyze the comparative advantage of Indonesian cocoa in beans and processed products as measured by RCA. This analysis will calculate several major exporters of cocoa beans and processed cocoa products to compare their comparative advantages, which industry groups often use for measurement purposes (Serin & Civan, 2008). The RCA values of Indonesian cocoa beans and processed cocoa products will be compared in this analysis.

Based on calculations from Indonesia's export data for 20 years, the data comes from the time series from 2001 to 2020. The results of the RCA calculations are presented in Table 2.

Table 2. The Result of The RCA Calculation

HS Code	Cocoa Product	RCA
1801	Bean	7.09
1802	Shell	1.19
1803	Pasta	7.34
1804	Butter	12.23
1805	Powder	6.06
1806	Chocolate	0.21

Source: data processed from RCA calculations

Based on the data above, Indonesia has competitiveness in products with HS 1801, 1802, 1803, 1804, and 1805 including cocoa bean

products, shells, pasta, butter, and powder. Indonesia has substantial comparative advantages in producing and exporting several cocoa products.

However, there is room for improvement, especially in products with an RCA of less than 1.

Trade Specialization Index (TSI)

As the third objective of this study, TSI is a measure to identify the stages of development of a product so that a country's trend can be identified. TSI will

review the growth rate of Indonesian cocoa products in international trade. Calculation of export-import data for Indonesian cocoa products for 20 years (2001-2020) obtained TSI values for cocoa beans, paste, butter, and powder, presented in Table 3.

Table 3. Calculation of TSI

Period	1801 (Cocoa Bean)	1803 (Cocoa Pasta)	1804 (Cocoa Butter)	1805 (Cocoa Powder)	1806 (Chocolate)
2001	0.81	0.66	0.99	0.73	0.32
2002	0.85	0.96	0.99	0.78	0.29
2003	0.77	0.90	0.99	0.79	0.15
2004	0.75	0.94	0.98	0.67	-0.16
2005	0.81	0.87	0.99	0.62	-0.34
2006	0.86	0.89	0.99	0.59	-0.22
2007	0.88	0.86	0.98	0.54	-0.15
2008	0.86	0.67	0.99	0.52	-0.25
2009	0.86	0.85	0.99	0.35	0.15
2010	0.86	0.81	0.99	0.43	0.25
2011	0.81	0.77	0.99	0.54	0.13
2012	0.72	0.88	0.99	0.49	0.09
2013	0.70	0.79	0.98	0.41	-0.08
2014	-0.26	0.96	0.97	0.47	-0.25
2015	-0.19	0.98	0.98	0.59	-0.40
2016	-0.30	1.00	0.96	0.56	-0.34
2017	-0.80	1.00	0.97	0.49	-0.36
2018	-0.75	1.00	0.96	0.49	-0.39
2019	-0.75	1.00	0.97	0.44	-0.38
2020	-0.73	1.00	0.98	0.55	-0.25

Source: data processed from TSI calculations.

In HS 1801 for cocoa bean products, the maturity stage was reached in 2001-2013, but in 2014, there was a decrease in the TSI value, indicating the import phase. Furthermore, in 2014-2020, cocoa beans entered the import substitution

stage, with TSI values ranging from -0.50 to 0.0, indicating a decline in export specialization. In 2003, 2004, 2012, and 2013, the TSI table for HS code 1801 (cocoa beans) shows a TSI value below 0.81. This shows that Indonesia focused less on cocoa bean products during that

period. Factors such as reduced production efficiency, increased global competition, or shifts in domestic or international market dynamics can cause this. TSI values outside the range of 0.81 to 1.00 in specific years indicate that the Indonesian cocoa bean industry is not consistently at the maturity stage in terms of global trade specialization in those years. Understanding the reasons behind this and the broader context is critical in formulating strategies to increase Indonesia's competitiveness and specialization in the global cocoa market.

HS code 1803 (cocoa paste) has the lowest TSI value of 0.66, and the highest is 1. This range shows that Indonesia has a relatively high level of specialization in the cocoa paste trade. A value close to 1 indicates a strong comparative advantage. Indonesia can compete well in the global market for cocoa paste.

HS code 1804 (cocoa Butter) is at the commercial maturity stage, with a TSI value of 0.96, the highest being 0.99. This indicates that cocoa butter is a stable product with a strong comparative advantage in trade. This shows a very high level of specialization in the cocoa butter trade, placing

Indonesia as one of the leading exporters on the global market.

In the HS code 1805 (cocoa powder), the TSI value between 0.01 and 0.81 indicates that the Indonesian cocoa powder industry is at a growth stage in international trade. This shows that Indonesia has begun to develop unique expertise in cocoa powder products but has not yet reached a high level of specialization. Development is needed to increase the production and export of cocoa powder by improving the quality, branding, and differentiation of cocoa powder products.

Finally, for HS code 1806, chocolate products have a TSI value calculation that is primarily negative (-0.4 to -0.10), indicating that Indonesia does not have a strong comparative advantage in international chocolate trade. A negative value indicates that the proportion of Indonesian chocolate exports is more significant in global trade. Positive values in 2001-2003 and 2009 -2012 may reflect more favorable market conditions or trade policies. The global chocolate industry is highly competitive, and Indonesia may face challenges from countries with more established and diverse chocolate industries. Investments in chocolate processing technology and product

development can help increase the competitiveness of Indonesian chocolate. The low and fluctuating TSI value for Indonesian chocolate shows that this country does not yet have a significant comparative advantage in this sector on the global market. Therefore, coordinated efforts are needed to improve the quality, branding, product innovation, and efficiency of Indonesian chocolate production and marketing to build comparative advantages in the future.

Indonesia is competitive in exports of processed cocoa products, such as cocoa butter and cocoa paste, but there is room for improvement in the cocoa bean industry and derivative products, such as chocolate and cocoa powder. Increasing Indonesia's comparative advantage in the global market requires strategic initiatives, technological investment, quality improvement, and effective marketing strategies.

CONCLUSION AND POLICY RECOMMENDATION

The research results show that in the GVC study, Indonesia has a strong position in international trade in several cocoa products. In the input-output structure dimension, efficiency in the Indonesian cocoa production and

processing process requires improvement, especially in utilizing Indonesia's diverse geographical potential. The geographic dimension of cocoa production affects quality and quantity, so it requires an approach tailored to each area. The Upgrading dimension requires innovation and increased capacity in the cocoa sector, both at the agricultural and processing levels. Governance requires policies and regulations supporting a globally competitive cocoa industry. The Stakeholder dimension requires integration and active participation from all related parties in the cocoa industry to increase efficiency and value distribution. To determine the types of products developed by RCA, cocoa products such as cocoa butter and cocoa paste show a high comparative advantage based on RCA analysis, while cocoa beans and chocolate have a lower comparative advantage.

Meanwhile, the results of identifying the growth stages of cocoa products in international trade with the TSI method can be concluded that cocoa products such as cocoa paste and cocoa butter are at the maturity stage, showing a stable comparative advantage. Cocoa powder is still growing, showing potential for further

development. Meanwhile, the low ITS value for chocolate indicates a lack of comparative advantage in the global market.

This research recommends that the government create policies focusing on products with high comparative advantage to increase production and marketing for products such as cocoa butter and cocoa paste and improving the quality and diversification of products such as cocoa beans and chocolate and developing Technology and Innovation to encourage innovation in cocoa processing and developing new products. The Indonesian government can also develop infrastructure in cocoa-producing areas to support production and distribution efficiency. Implement policies that support the growth and competitiveness of the cocoa industry, including incentives for exports and research and building closer cooperation between farmers, industry, and government to create efficient and sustainable value chains.

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