

An Investigation of the Dynamic of Cocoa Commodity Competitiveness in Indonesia and Ivory Coast Before and During Covid-19 Pandemic

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Abstract

As a primary agricultural commodity, cocoa is the essential commodity and source of income for farmers, workers, and companies in terms of its supply chain. In Indonesia, cocoa is a commodity number three after coconut palm oil and rubber. Therefore, it plays a crucial role in creating job opportunities, which focusing on agribusiness and domestic agroindustry, environmental conservation, and regional development. In conjunction with the significant contribution of cocoa as an agricultural commodity, this study seeks to investigate the cocoa commodity competitiveness dynamics in Indonesia and Ivory Coast before and during the Covid-19 pandemic. This study calculates the data of export using a four-digit Harmonized System (HS) on the basis of the United Nations' Standard International Trade Classification (SITC) from 2016 to 2020. In determining the country's competitiveness, this study applies the Balassa Revealed Comparative Advantage (BRCA). This study indicates that the competitive dynamics of cocoa commodities occurred in Indonesia and Ivory Coast before and during the Covid-19 pandemic. Thus, the chocolate industry network should promote good governance for improving sustainable agricultural resources, including fair and inclusive labour policy and green supply chains incentives. Also, creating a better policy climate for effective agricultural management and developing a downstream chocolate industry should be crucial for both countries.

Keywords

Comparative advantage, Agricultural Commodity, Cocoa, International Trade, Agriculture Innovation and Conservation

1. Introduction

Cocoa is the main agricultural commodity for most countries globally, both as a country exporter and importer. For many countries, cocoa is an important source of income for the state as well as farmers and all workers and companies in the supply chain. For Indonesia, cocoa is a commodity number three foreign exchange-producing agriculture after coconut palm oil and rubber. The main source of income for 1.7 million heads of farming actors scattered in almost all provinces and 81 thousand. Employee families' large plantations play a role in creating employment opportunities, encouraging agribusiness and domestic agroindustry, environmental conservation, and regional development (Ariningsih et al., 2010). According to International Cocoa Organization (ICCO), amount of cocoa consumed worldwide can be described from the grinding data, namely the number of cocoa beans that are processed into products semi-finished/intermediate/semi-finished, which in the form of paste (liquor), fat (butter), and powder (powder). The grinding of cocoa is carried out in Europe (especially in the Netherlands and Germany), Africa (especially in Ivory Coast and Ghana), America (especially in the United States and Brazil), and Asia and Oceania (especially in Indonesia and Indonesia Malaysia). However, countries that do grinding

cocoa do not necessarily consume all processed products; some are indeed consumed, all domestically, some are exported domestically semi-finished product form (International Cocoa Organization, 2020).

Cocoa plants are grown in tropical areas around the Equator, where land and climate are favourable for planting cocoa beans. In terms of world contribution, West African countries including Ivory Coast, Ghana, Nigeria and Cameroon contributed around 70 percent of the world's cocoa beans. The Ivory Coast, followed by Ghana, is the two cocoa largest producer, accounting for about 50 percent of the world's cocoa. In 2016, the Ivory Coast alone produced around 1.6 million metric tons of cocoa beans. The nation is expected to produce cocoa beans with almost 1.9 million metric tons during the 2016-2017 period (Shahbandeh, 2021). Following the national cocoa development roadmap, the Indonesian government started to boost the cocoa supporting industry.

For this reason, Indonesia's Ministry of Finance has set an export duty for cocoa beans of up to 15% under No. 67/PMK.011/2010 regulation which has been in effect since 2010. This regulation aims to develop the domestic cocoa downstream industry, promoting exports of high-performance cocoa products and then creating more competitive cocoa products. The regulation has affected the increase of exports value and shifted from cocoa beans to semi-processed cocoa products, such as cocoa in the forms of paste, fat and powder.

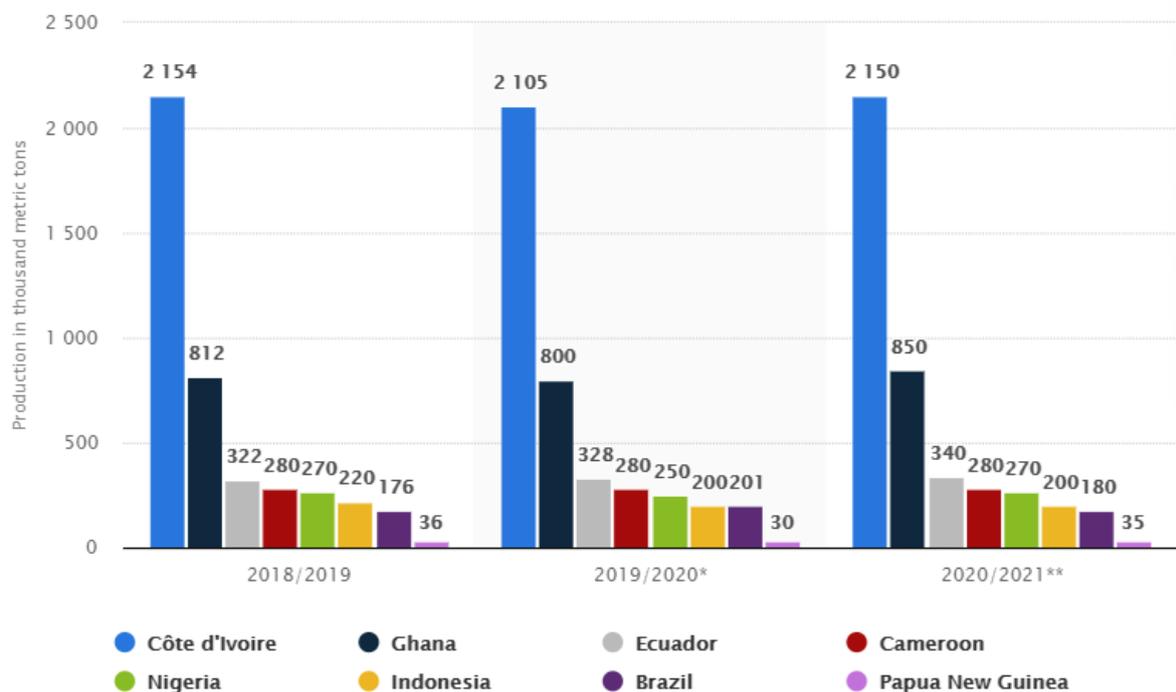


Figure 1. Global cocoa bean production in 2018/19 and 2020/21, by country (in 1,000 metric tons)

Source: Statista (2021)

With changes in the export's composition and international market dynamics for each type of Indonesian cocoa product, from raw to processed cocoa, it will be crucial in understanding the competitiveness of Indonesian cocoa. It is substantial when countries determine the agricultural strategy to gain from international cocoa trade. Especially with the downward trend in world production, the increase in world consumption can be seen as an opportunity-filled by Indonesian cocoa (Tresliyana et al., 2015). Therefore, comparative advantage analysis is needed for a basis of policymaking for all cocoa stakeholders in Indonesia and the Ivory Coast. The policies taken can be directed according to actual national and global conditions. This research aims to determine the cocoa comparative advantage dynamics between Indonesia and Ivory Coast before and after Covid-19 pandemic, then discuss the pattern of cocoa competitiveness of main cocoa producer's countries in the world.

2 Methodology

This research calculates the data based on cocoa commodities of Indonesia and the Ivory Coast from 2016 to 2020. Data of exports of Indonesia were collected from the International Trade Center publication, the United Nations and BPS Statistics Indonesia. Data of Ivory Coast's exports were collected from the ITC calculations based on *Institut National de la Statistique (INS) de Côte d'Ivoire*. In order to understand the comparative advantage appropriately, the data are based on 4-digit level Harmonized System (HS) following the Standard International Trade Classification (SITC). The comparative advantage approach is a powerful method that can be implemented to understand the market map with the highest likelihood of success. Several common uses of BRCA

indexes are eligible to uncover countries' fundamental patterns of comparative advantage, evaluate the differential effect of changes in the trade of different products, or identify countries who are relatively close competitors in a given market (French, 2017). Two different approaches are chosen to calculate the country's comparative advantage on trade. Firstly, the Domestic Resource Cost (DRC) method. The DRC methodology is more dynamic but requires data on the cost of production that is not available, especially for developing and less developing countries. Secondly, the Revealed Comparative Advantage (RCA) method. The RCA method normally is less predictive than the DRC. Many studies use RCA because the data are normally available, especially for less developed countries. It aims to understand the dynamics of comparative advantage in the long run; data availability is necessary. Therefore, the RCA, with its consequence, will be the best choice. RCA measures a country's export market share in a similar industry group as other producer countries; therefore, it is normally adopted to measure comparative advantage (Serin & Civan, 2008).

Since being introduced by Balassa (1965), RCA has been popularly adopted in understanding comparative advantage between domestic and foreign countries. However, with the new paradigm, as Greenaway & Milner (1993) explained, the Balassa comparative advantage is biased from the perspective that it just ignores the influence of imports and just takes exports into account. This simplification could imply the problem of underestimation of the comparative advantage or disadvantage dynamics where the problem of asymmetry information and adverse selection occur. In addition, many scholars choose to adopt Balassa RCA in explaining more comprehensive and objective measurement methods (Balassa, 1989). The exports performance of Indonesia and Ivory Coast in cocoa products to the counterpart is calculated by the export value of all cocoa and cocoa preparation products from Indonesia and Ivory Coast to total exports to the importing country. Thus, this is usually known as the ability or inability of Indonesia and Ivory Coast exports to compete against the importer countries. BRCA calculations of Indonesia are formulated in the formula below.

$$BRCA_{Indonesia} = \frac{\left(\frac{X_{fi}}{X_i}\right)}{\left(\frac{X_{fw}}{X_w}\right)}$$

Where:

- X_{fi} : Export value of Indonesia cocoa commodities to the importer countries of Indonesia
- X_i : The total export value of aggregate Indonesia commodities to the Indonesia's importer countries
- X_{fw} : The value of world cocoa commodities exports to cocoa importers in global trade chain
- X_w : The total value of world's exports

While, the BRCA calculations of Ivory Coast can be calculated based on the formula below.

$$BRCA_{Ivory\ Coast} = \frac{\left(\frac{X_{fj}}{X_j}\right)}{\left(\frac{X_{fw}}{X_w}\right)}$$

Where:

- X_{fj} : Export value of Ivory Coast's cocoa commodities to the importer countries of Ivory Coast
- X_j : The total export value of all Ivory Coast's commodities to the importer countries of Ivory Coast.
- X_{fw} : The value of world cocoa commodities exports to cocoa importers in global trade chain
- X_w : The total value of world's exports

If the BRCA score is below 1, it shows that the commodities have weak competitiveness. If the BRCA score is between 1 – 2, cocoa and cocoa preparations have a medium competitiveness level. If the score is higher than 3, it states that the product has a strong comparative advantage.

3 Results and Discussion

3.1 Results

Cocoa in the world is produced by the African region (mainly from Ivory Coast, Ghana, Cameroon, Nigeria), America (mainly from Ecuador and Brazil), and Asia-Oceania (mainly from Indonesia and Papua New Guinea). Over the past 5 years, cocoa production increased by about 800 thousand tons, from 3.997 million tons to 4.824 million tons. As a result, ascension occurred in the African region (from 2,922 million tons to 3.693 million tons)

and America (from 677 thousand tons to 853 thousand tons. However, in Asia, there was a decrease in production by 120 thousand tons, from 397 thousand tons to 277 thousand tons.

The amount of cocoa consumed worldwide can be described from the grinding data, namely the number of cocoa beans that are processed into products semi-finished/intermediate/semi-finished, which in the form of paste (liquor), fat (butter), and powder (powder). The grinding of cocoa is carried out in Europe (especially in the Netherlands and Germany), Africa (especially in Ivory Coast and Ghana), America (especially in the United States and Brazil), and Asia and Oceania (especially in Indonesia and Indonesia Malaysia). Countries that do grinding cocoa do not necessarily consume all processed products; some are indeed consumed domestically, some are exported domestically semi-finished product form.

Table 1. Result of BRCA Calculation for Indonesia and Ivory Coast in Cocoa and Cocoa Preparations

HS Code	HS description	RCA Indonesia					RCA Ivory Coast				
		2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
1801	Beans of cocoa, roasted or raw, broken or whole	0.34	0.26	0.31	0.36	0.30	3.37	3.85	3.77	3.91	3.50
1802	Cocoa skins, shells, husks, and other cocoa waste	0.31	0.47	0.41	0.33	2.01	8.31	7.75	9.20	8.44	0.53
1803	Cocoa paste, whether or not defatted	3.16	2.60	2.16	2.01	1.55	2.36	1.97	2.11	2.13	2.34
1804	Cocoa oil, fat and butter	4.95	5.45	6.00	5.77	5.57	0.84	0.76	0.78	0.67	0.72
1805	Cocoa in powder form, without added sugar or other sweetening material	2.51	2.70	2.56	2.59	3.16	0.26	0.27	0.28	0.24	0.28
1806	Chocolate and all food preparations with cocoa ingredient	0.07	0.06	0.06	0.07	0.06	0.05	0.04	0.05	0.05	0.05

Source: ITC Database (2021)

This paper describes the analysis in three steps in comparing cocoa competitiveness dynamics in Indonesia and the Ivory Coast. In the first step, we calculate the competitiveness level using BRCA Approach and compare Indonesia's and Ivory Coast's competitiveness during 2016-2020. In the second step, we look at the BRCA calculation and see whether both countries have competitiveness in particular cocoa commodities. In the last step, we see the competitiveness of cocoa and cocoa preparations in Indonesia and the Ivory Coast. In determining the level of competitiveness, we divide the level into three categories. If the BRCA score is under 1, it means the commodities have weak competitiveness. If the score is between 1-3, the products have a medium level of competitiveness. When the BRCA score reached more than 3, that means the products have strong competitiveness.

During 2016-2020, Indonesia enjoyed advantage-specialisation in three groups of commodities, namely HS Code 1803, HS Code 1804, and HS Code 1805. Table 1 displays that HS-1804 commodities persistently exhibited high competitiveness with RCA score higher than three. For example, cocoa in oil form, fat and butter had exhibited a strong RCA score during the last five years. The other products, such as cocoa in powder form, without added sugar or other sweetening material, had consistently gained a positive trend in comparative advantage with RCA between 2 and 3. Another product, such as cocoa paste, remains stable with a medium level of competitiveness, whether or not defatted.

Unfortunately, Indonesia has a lower comparative advantage in some commodities, including HS-1801, HS-1802 and HS-1806, with RCA under 1 since 2016. The argument of the export uncompetitiveness was explained by Robert (2004) in China and ASEAN cases and Kien (2009) with the gravity model in ASEAN countries. They found that distance between Indonesia and export destination countries represents the cost of transportation, so the further away the distance will reduce trade flow because it will increase transportation costs. It also is related to the export duty policy for cocoa beans issued by the government of Indonesia since 2010. The export duty policy succeeded in inhibiting cocoa bean exports so that the domestic cocoa processing industry succeeded in developing and resulted in an increase in processed cocoa exports (Maulana & Kartiasih, 2017).

In the same period, Ivory Coast enjoyed the level of competitiveness of the cocoa product, especially for HS-1801, HS-1802 and HS-1803. Cocoa beans, roasted or raw, broken or whole, have persistently contributed strong comparative advantage for Ivory Coast international trade with BRCA score above 3. Cocoa skins, shells,

husks, and other cocoa waste were the champion product for the country from 2016 until 2019. Unfortunately, these commodities exhibited weak competitiveness during 2020. It could be the effect of Covid -19, which decrease the demand for these commodities. The Covid-19 pandemic is more complicated than the previous crisis, which is not affected by the sudden increase in food prices and food affordability caused by hyperinflation. Covid-19 seems to entangle food systems such as unemployment, food price uncertainty and unstable food supply chains (Clapp & Moseley, 2020). Another product, such as Cocoa paste, whether or not defatted, experienced a medium level of competitiveness with BRCA score between 2 to 3.

Table 2. Indonesia and Ivory Coast BRCA Result of Cocoa and Cocoa Preparations in 2016-2020

HS Code	HS description	Indonesia: Is it competitive?					Ivory Coast: Is it competitive?				
		2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
1801	Beans of cocoa, roasted or raw, broken or whole	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
1802	Cocoa skins, shells, husks, and other cocoa waste	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No
1803	Cocoa paste, whether or not defatted	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1804	Cocoa oil, fat and butter	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
1805	Cocoa in powder form, without added sugar or other sweetening material	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
1806	Chocolate and all food preparations with cocoa ingredients	No	No	No	No	No	No	No	No	No	No

Source: Author calculation from ITC Database (2021)

Table 2 indicates no significant cocoa comparative advantage changes in both countries before and after the covid pandemic except for cocoa skins, shells, husks, and other cocoa waste. Indonesia has experienced a weak comparative advantage for these products since 2016. When compared Indonesia to the other two leading exporters, the comparative advantage of Indonesia's cocoa bean exports is far below that of Ivory Coast and Ghana. These two countries are the primary producers of cocoa beans which account for more than 50 percent of the cocoa bean production in the world. In addition, cocoa beans from these countries have gone through fermentation, so that the price is higher than other countries (Ragimun, 2012). Cocoa production competition also occurs in the African region, for example, Nigeria, which is currently developing various techniques for cocoa rehabilitation and rejuvenation of cocoa plantations to increase production and productivity (Taiwo et al., 2015).

During the period 2020, when the pandemic affected many countries, Indonesia gains from cocoa skins, shells, husks, and other cocoa waste international trade compared to the rest of the world. Unfortunately, Ivory Coast was the country that exhibited weak competitiveness in similar products during the covid-19 pandemic. If we see table 2, from 2016 until 2019, cocoa skins, shells, husks, and other cocoa waste were the featured product for Ivory Coast's international trade commodities. Therefore, when the sudden pandemic hit the whole country, these products become uncompetitive for Ivory Coast.

Table 3. Cocoa and Cocoa Preparations Level of Competitiveness for Indonesia and Ivory Coast 2016-2020

HS Code	HS description	Indonesia: Competitiveness Level					Ivory Coast: Competitiveness Level				
		2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
1801	Beans of cocoa, roasted or raw, broken or whole	Weak	Weak	Weak	Weak	Weak	Strong	Strong	Strong	Strong	Strong
1802	Cocoa skins, shells, husks, and other cocoa waste	Weak	Weak	Weak	Weak	Medium	Strong	Strong	Strong	Strong	Weak

1803	Cocoa paste, whether or not defatted	Strong	Medium	Medium	Medium	Weak	Medium	Weak	Medium	Medium	Medium
1804	Cocoa oil, fat and butter	Strong	Strong	Strong	Strong	Strong	Weak	Weak	Weak	Weak	Weak
1805	Cocoa in powder form, without added sugar or other sweetening material	Medium	Medium	Medium	Medium	Strong	Weak	Weak	Weak	Weak	Weak
1806	Chocolate and all food preparations with cocoa ingredients	Weak	Weak	Weak	Weak	Weak	Weak	Weak	Weak	Weak	Weak

Source: ITC Database (2021)

Considering the level of competitiveness calculation in table 3, we can see Indonesia and Ivory Coast contradict their international trade. When Ivory Coast enjoyed a strong comparative advantage for cocoa beans, roasted or raw, broken or whole (HS-1801), Indonesia was the country that exhibited weak competitiveness during the last five years. This phenomenon is also experienced by other commodities, cocoa skins, shells, husks, and other cocoa wastes (HS-1802) were featured products for Ivory Coast from 2016 until 2019, then suddenly these products became uncompetitive in 2020. On the other hand, Indonesia had weak competitiveness in similar commodities (HS-1802), except in 2020, when Indonesia enjoys medium competitiveness.

The most volatile products were cocoa paste, whether defatted (HS-1803), both countries experienced strong, medium and weak competitiveness during the last five years. Commodities that are the mainstay for Indonesia during the previous five years were cocoa oil, fat and butter (HS-1804). During 2016-2020 Indonesia enjoyed a strong comparative advantage. Even the covid-19 pandemic has no significant effect on the international trade of this product. In contrast, for similar products, Ivory Coast persistently exhibited weak competitiveness during 2016-2020. For other commodities, for instance, cocoa in powder form, without added sugar or other sweetening material (HS-1805), although Indonesia enjoys medium competitiveness, Ivory Coast had weak competitiveness. The last commodities, chocolate and all food preparations with cocoa ingredients (HS-1806), both Indonesia and Ivory Coast exhibited weak competitiveness.

3.2 Discussion

Massive production of HS-1806 is the indicator of a country's chocolate processing industry development. So, when these commodities are weak, Indonesia and Ivory Coast export mostly cocoa raw material or semi-finished products. Consequently, the added values of cocoa commodities are less than those countries which produce HS-1806 more. For example, Germany, Belgium and Italy are the top chocolate exporters countries globally, although they have no single cocoa farm. Belgium is the main player in the cocoa supply chain, importing the beans from Ivory Coast and Ghana and exporting them across Europe and other continents. Belgium is also home to the world's largest chocolate industry, supporting its annual chocolate exports worth \$3.1 billion. Unfortunately, According to World Economic Forum, farmers are among the lowest earners from a tonne of sold cocoa, accounting for just 6.6% of the final sale value. The bitter side of the cocoa global supply chain is that cocoa farmers in Ghana make \$1/day, while those in Ivory Coast make around \$0.78/day—both significantly below the extreme poverty line. It is below the threshold for extreme poverty at \$1.90/day established by The World Bank. Farmers are often unable to bear the costs of cocoa farming as a result of low incomes. In turn, they employ children, who miss out on education, are exposed to hazardous working conditions, and get paid little or no wages (Bhutada, 2020). Similar problems also occurred in Indonesia. Cocoa bean price fluctuations in Indonesia are always following international prices (Tsowou & Gayi, 2019). The export tax for some cocoa bean products leads the price received by Indonesian farmers (farm gate price) was only 65% to 77.3% of international prices (Neilson et al., 2013).

In the short term, the Covid-19 pandemic has affected the exchange rate of both Indonesia and the Ivory Coast, which could imply price stability. According to FAO analysis, the pandemic Covid-19 affects all aspects of food and agriculture, including cocoa. Restrictions of international and national movements as well as gathering could have a negative effect on production. Fertiliser distribution and all production facilities will be hampered, and then it could have consequences to lower production. Likewise, transportation results to the market are also hampered, processing in factories and distribution of products to retail outlets. All of these will result in a decrease in supply. The massive restriction of movement, the obligation to work from home, implies less income for those who work in the non-formal sector.

Consequently, many workers will reduce the consumption budget and minimise the purchase of secondary and tertiary needs. Chocolate will be placed in a non-priority position for daily consumption (Abdoellah, 2021). The substantial shocks affected by the Covid pandemic will decrease revenue and loss potential market, which are initially influenced by travel prohibitions, lockdown, and production limitations. There will be new challenges for cocoa producers in the new normal era, including significant changes in business landscape, use of e-commerce, and consumer education. Therefore, countries should adopt a new strategy in winning the market competition (Cadby, 2021)

Shortly, cocoa networks must maintain in good governance mechanism. The chocolate industry that gained higher added value in cocoa production process should consider accountability, fairness, and transparency in the whole production process. It can be implemented when the cocoa industry considers farmers' revenue and sustainable rural development (Daniels et al., 2012). Through governance reforms collaboration, the existing sustainability and ethical challenge that is well known in this industry can be addressed and resolved for the sustainability of the chocolate industry that creates prosperity for all parties (Thorlakson, 2018). It can be implemented when cocoa producer's country develops multi-stakeholder partnerships in creating global engagement of all cocoa and chocolate stakeholders to ensure the implementation of a sustainable cocoa market.

4 Conclusion

Indonesia and Ivory Coast have experienced international trade dynamics in Cacao commodities since the last decades. Ivory Coast, Ghana and Indonesia have contributed around 70 percent of cocoa production in the world. According to the BRCA analysis, both countries have enjoyed strong competitiveness mainly from raw material or semi-finished cocoa commodities. For instance, Indonesia has a strong and medium comparative advantage for cocoa paste, whether or not defatted, as well as cocoa oil, fat and butter. While Ivory Coast is competitive in producing cocoa skins, shells, husks, and other cocoa waste, and cocoa beans, roasted or raw, broken or whole. Unfortunately, both countries experienced weak competitiveness in processed or final cocoa commodities such as chocolate and all food preparations with cocoa ingredients (HS-1806). For Indonesia, international trade revenues from cocoa commodities are profitable, especially for semi-processed cocoa products. For Ivory Coast, as it is the major cocoa exporter product globally, it depended on market stability to gain from trade. Furthermore, Ivory Coast and Indonesia should increase the added value of cocoa commodities by developing the downstream chocolate industry. It could be realised if both countries focus more on increasing their human development capacity in chocolate production. Moreover, the dynamics of international trade should be considered that all stakeholders in those countries have to perform well, ignore business as usual efforts, overcome the problem of child labour, and create sustainable agriculture resources.

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