

## CHAPTER **FOUR**

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# The Three Great Stimulants: An Analysis of the Cocoa, Coffee, and Tea Value Chains in Africa

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## INTRODUCTION

Monocrop cultivation of cocoa, coffee, and tea, the world's three great stimulants,<sup>1</sup> emerged in Africa in the 19th century as colonizing countries sought to cater to European consumers. Following independence, African countries continued to export agricultural commodities, with little change in the established production and trade structures. As post-colonial governments adopted industrialization and import substitution policies in the 1970s, heavy state intervention and taxation of export crops became the norm, particularly for cocoa, coffee, and tea, and little attention was given to agricultural diversification.

In the 1980s and 1990s, agricultural markets and trade were liberalized under the umbrella of structural adjustment programs. However, African agricultural exports remained concentrated in traditional tropical products, with Europe as their main market. Today, the cocoa, coffee, and tea value chains are still characterized by the concentration of domestic producers in unprocessed, typically low value-added upstream activities. The nature of the three crops in part explains why processing into final or semi-final products is likely to take place in or near consumer countries, rather than in Africa. Nevertheless, persistent technical, infrastructural, and institutional barriers in Africa also hinder advances and diversification in production and limit the region's potential to move up the value chain and offer final products in the large global markets for these products.

This chapter assesses the participation of African countries in cocoa, coffee, and tea value chains and considers whether African countries are trading above or below their potential at various processing levels. Our findings show that Africa's exports are concentrated in unprocessed cocoa and coffee and semi-processed tea, with a significant proportion of these exports involving little or no processing. In addition, many African countries are under-trading cocoa, coffee, and tea across all three levels of processing, and thus have substantial potential to trade more both in volume and in terms of product variety and sophistication. Our findings also highlight the importance of the emerging trade flows with developing countries as well as the importance of expanding intra-African trade, as a first step toward international competitiveness.

The chapter is organized as follows: First, we provide a brief historical overview of the production of these three crops and the determinants of value-chain participation rooted in the continent's colonial heritage and post-independence policies. In the next section, we analyze trade in cocoa, coffee, and tea by processing level. We identify Africa's top exporters and main market destinations by commodity, and calculate the revealed comparative advantage of different African countries. We then present our main findings from a gravity model used to estimate differences between actual and predicted levels of trade. These estimates show us whether African countries are over- or under-trading in the three commodity chains. This analysis is followed by a discussion of major institutional, technical, and infrastructural barriers to greater participation in global value chains for cocoa, coffee, and tea. The chapter's conclusion offers key policy recommendations for more diversified and higher value-added trade within these three value chains.

## THE HISTORY OF TRADE IN STIMULANTS

The structure of African agriculture and the degree of participation in value chains today has been largely shaped by the continent's colonial trade relations. Before the arrival of the first European maritime traders to the west coast of Africa in the 15th century, trade within Africa

<sup>1</sup> Cocoa, coffee, and tea are the best-known edible plant species containing caffeine. Chocolate, coffee, and tea are therefore known as stimulant foods and beverages.

was based on specialization and complementarity. For example, the savannah region south of the Sahel produced cereals, the Sahara specialized in rock salt, the Sahel provided livestock and leather products, West Africa was rich in gold, and North Africa was famous for textiles (Akyeampong 2015). Beyond the continent, Arab traders facilitated exchange with Asia. Trade caravans exported goods from inland locations in Africa and imported Asian goods (such as textiles, silks, spices, and glass) to the continent (Bjornlund et al. 2020).

With the establishment of European trading companies, increasing trade flows between Africa and the European colonial powers were accompanied by large-scale land-intensive agriculture. Production of export crops such as cocoa, cotton, peanuts, palm oil, and rubber expanded at the expense of traditional food and fiber crops. Two main events drove this evolution: On the supply side, the abolition of the slave trade by the British Empire in the 19th century increased the labor available for agriculture. On the demand side, industrialization raised European living standards and preference for luxury goods, such as sweets. In the case of chocolate, for example, the mechanization of chocolate-making increased the demand for cocoa significantly (Akyeampong 2015). Africa's growing concentration in export commodities increased the exposure of African communities to fluctuations in global demand and prices for exported goods. Not only did volatility increase but also emerging industries were eroded as export-oriented agriculture expanded, a trend that would continue even after African countries gained independence.

Following the division of Africa into colonial territories at the Berlin Conference of 1884, African colonies were transformed into monocrop, export-oriented producers catering to markets in the northern hemisphere. For example, cocoa was grown in Ghana and Nigeria, coffee in Kenya and Tanzania, and tea in Kenya and Malawi. Colonizers established marketing boards that controlled prices and exports of these commodities, with just a small fraction of the consumer price passed on to the farmers. The absence of domestic profit margins and lack of local wealth accumulation left little room for upgrades, investment, or development in the agriculture sector (Bjornlund et al. 2020).

African countries acquired their independence between the mid-1950s and the mid-1970s. However, most countries continued to specialize in colonial-era export crops. Post-colonial political structures favored the status quo in agriculture as those who held power were often the same people who had benefited from colonial rule, and foreign aid to the newly independent governments was initially granted to maintain the interests of donor countries in crops, raw materials, and natural resource extraction (Bjornlund et al. 2020). In the 1970s, African countries adopted import-substitution and industrialization policies. To fund these development policies, agricultural production and exports were heavily taxed and further burdened by pervasive state intervention in agricultural markets. In West Africa, for example, state boards controlled prices,<sup>2</sup> marketing, and exports of cocoa and coffee beans (Westlake 2014). In addition, overvalued exchange rates, put in place to make imports of industrial inputs artificially cheaper, made crop exports less competitive. These heavy distortions of the agriculture sector acted as disincentives for local growers to diversify production or upgrade their traditional exports of cocoa, coffee, and tea to more sophisticated products.

In the 1980s and 1990s, declining economic performance forced African countries to resort to repeated structural adjustment programs. Under the umbrella of liberalization, privatization, and deregulation, most restrictions and distortionary interventions were lifted from the agriculture sector. However, trade liberalization also led to increased volatility through exposure to external shocks and declining global commodity prices.

<sup>2</sup> Yet, it is important to note that Boratav (2001), based on 20 sub-Saharan countries, finds that deregulation and the elimination of marketing boards has not been associated with improvements in real producer prices or in the terms of trade.

Although African countries failed to diversify and upgrade their exports, they did diversify their export destinations slightly. Indeed, while preferential access granted to European markets encouraged the continued concentration of African exports in the European Union (EU) and OECD countries – especially under the Everything but Arms (EBA) and the Generalized System of Preferences (GSP) schemes with Europe and the African Growth and Opportunity Act (AGOA) scheme with the United States – China became an important buyer of African exports. Based on UNCTAD data, the EU is now the export destination for 33 percent of Africa’s total exports and China is the destination for 14 percent. Moreover, tariff escalation (tariffs that increase with the product’s level of processing) led to a deeper specialization in unprocessed products. For instance, the EU tariff imposed on coffee beans under the GSP is 0 percent, while roasted beans face a 2.6 percent tariff. The same applies to cocoa beans (0 percent), cocoa butter (4.2 percent), and cocoa paste (6.1 percent). Consequently, this concentration in trading partners acted as a disincentive to moving away from traditional exports like cocoa, coffee, and tea and exploring new opportunities in new markets. In addition to these trade policy factors, the processing stages in value chains for cocoa, coffee, and tea are dominated by a small number of multinational firms. This concentration of power in downstream activities makes it difficult for domestic firms in Africa to compete and market their products internationally. Together these factors have led to the specialization of African countries in unprocessed products. The following section provides an overview of trade in stimulants by processing level.

## OVERVIEW OF TRADE IN COCOA, COFFEE, AND TEA

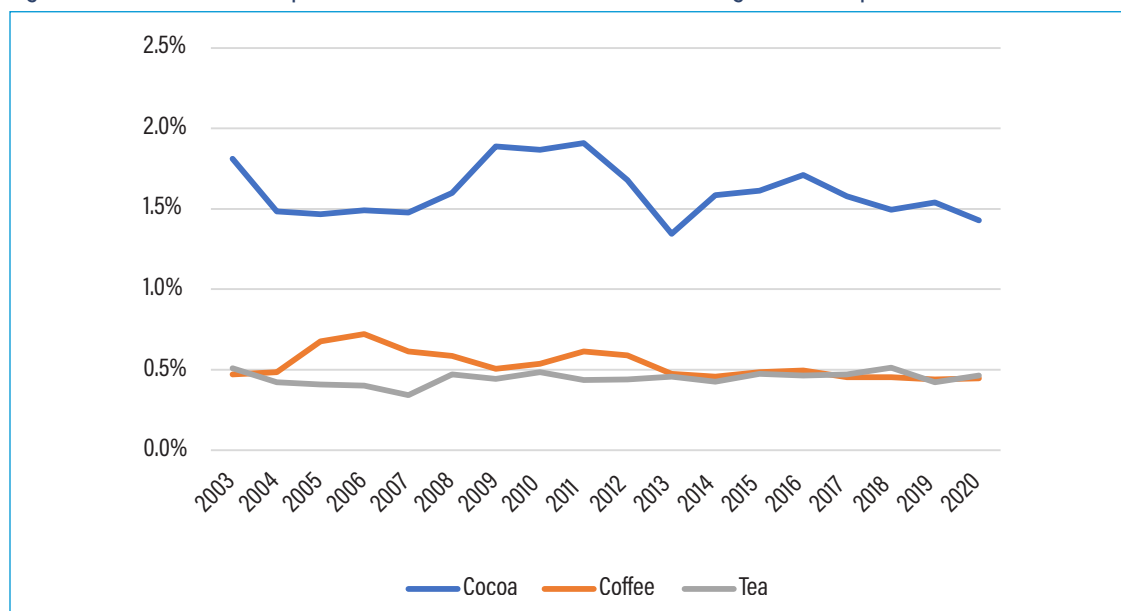
### Trade flows

To analyze Africa’s trade performance in the cocoa, coffee, and tea value chains, we begin by looking at the evolution of Africa’s total exports of the three commodities and then at trade in each commodity by processing level. Next, we assess the position of African countries among the world’s top exporters of these commodities and calculate Africa’s revealed comparative advantage for each by level of processing. Finally, we look at the evolution of Africa’s major export destinations. Throughout the analysis, we compare the average trade performance in two periods: 2006–2010 and 2016–2020.<sup>3</sup>

Figure 4.1 depicts the evolution of the share of cocoa, coffee, and tea exports in total African agricultural exports by value between 2003 and 2020. The share was relatively stable over time for coffee and tea, at about 0.5 percent, and has slightly declined for coffee, from 1.8 percent in 2003 to 1.4 percent in 2020.

<sup>3</sup> We adopt these two periods in order to include the most recent years and compare Africa’s performance over an entire decade.

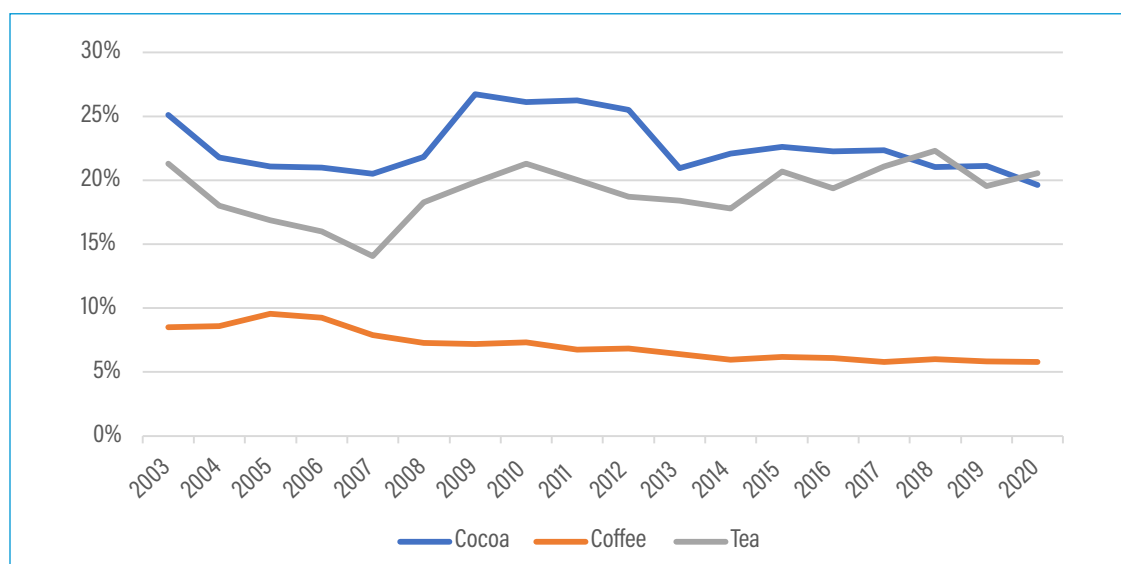
Figure 4.1 Share of African exports of cocoa, coffee, and tea in total African agricultural exports



Source: 2022 AATM database.

Africa's share in the world's total exports of the three commodities is illustrated in Figure 4.2. Clearly, Africa is a major producer and exporter of cocoa, providing nearly one-fifth of the world's cocoa exports. This share has decreased over time, however. Following its recovery from a drop during the global crisis, Africa's share of cocoa exports remained above 25 percent between 2009 and 2013, but fell to 19.6 percent in 2020. The same declining trend during the crisis can be observed for tea exports, with Africa's share in world exports reaching a low of 14.1 percent in 2007. African tea exports recovered to 21.3 percent in 2010, and by 2020 accounted for 20.6 percent of the world's exports. Africa's significant share of global tea exports is explained by Kenya's contribution, as one of the world's major tea producers and exporters and by the role of the Mombasa Tea Auction in marketing African tea. African coffee exports comprise a much smaller share of global exports, with a steady decline from 8.5 percent in 2003 to 5.8 percent in 2020.

Figure 4.2 Share of African exports in world exports of cocoa, coffee, and tea



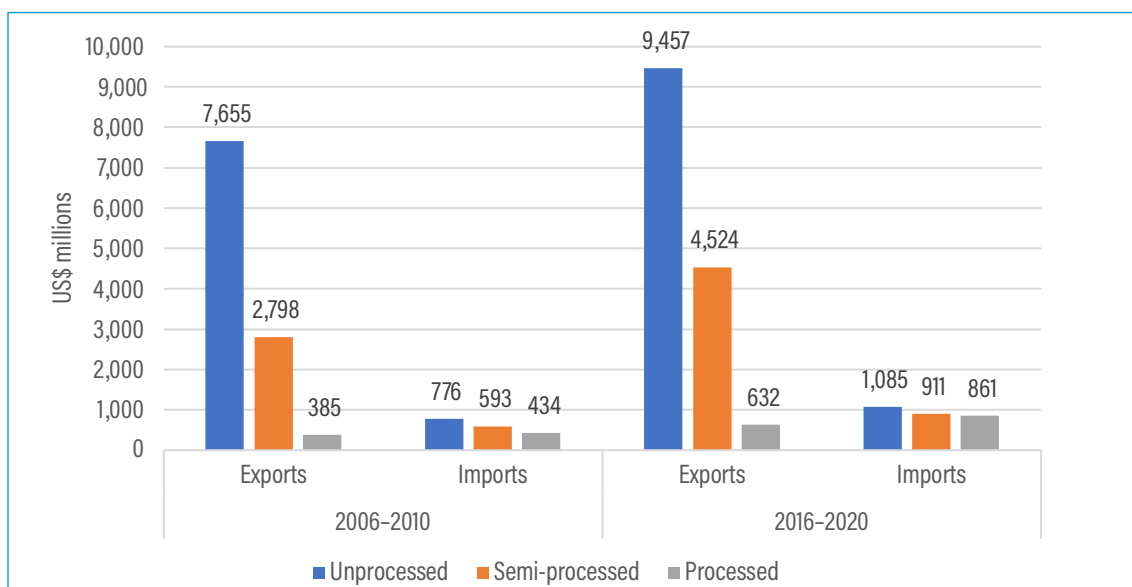
Source: 2022 AATM database.

### Trade by level of processing<sup>4</sup>

Figure 4.3 depicts the average value of exports and imports of cocoa, coffee, and tea by level of processing during two periods, 2006–2010 and 2016–2020. African exports of the three goods are typically dominated by unprocessed commodities. During the first period, the average value of unprocessed exports of cocoa, coffee, and tea was US\$7.655 billion<sup>5</sup>, which constituted more than 70 percent of Africa’s total exports of the three goods. During the second period, this concentration appears to diminish slightly, as the average value of unprocessed exports (\$9.457 billion) dropped to 64.7 percent of the total value of exports. The value of semi-processed commodities increased from \$2.798 billion to \$4.524 billion between the periods, with an increase in share from 25.8 to 30.9 percent. The share of processed goods remains modest, with an increase from 3.5 to 4.3 percent between the two periods.

Imports of the three commodities by value are relatively small compared to the exports. Unprocessed imports of cocoa, coffee, and tea rose from \$776 million during the first period to \$1.085 billion during the second. Total African imports of unprocessed and semi-processed goods include intra-African imports that are likely imported for the purpose of processing and re-exporting. For example, Egypt is a major importer of semi-processed tea not only for domestic consumption but also for packaging, marketing, and re-export. Apart from Ethiopia’s consumption of coffee and Egypt’s consumption of tea, Africa is not a major consumer of these three products. This is in line with the historical concentration of African agriculture in export cash crops. Income levels and the market size in Africa could also explain the limited imports of processed products, which suggests low variety of imports and low consumption. In addition, regional value chains for these commodities are underdeveloped. According to 2022 AATM data, the shares of intra-African exports in total African exports were stable at around 0.02 percent for cocoa, 0.15 percent for coffee, and 0.2 percent for tea between 2006 and 2020. As will be explained later in this chapter, differences in trade policy among Africa’s regional economic communities, especially in tariffs and nontariff measures, hinder the development of value chains within Africa and undermine the potential for the development of locally manufactured products.

Figure 4.3 African exports and imports of cocoa, coffee, and tea, by level of processing



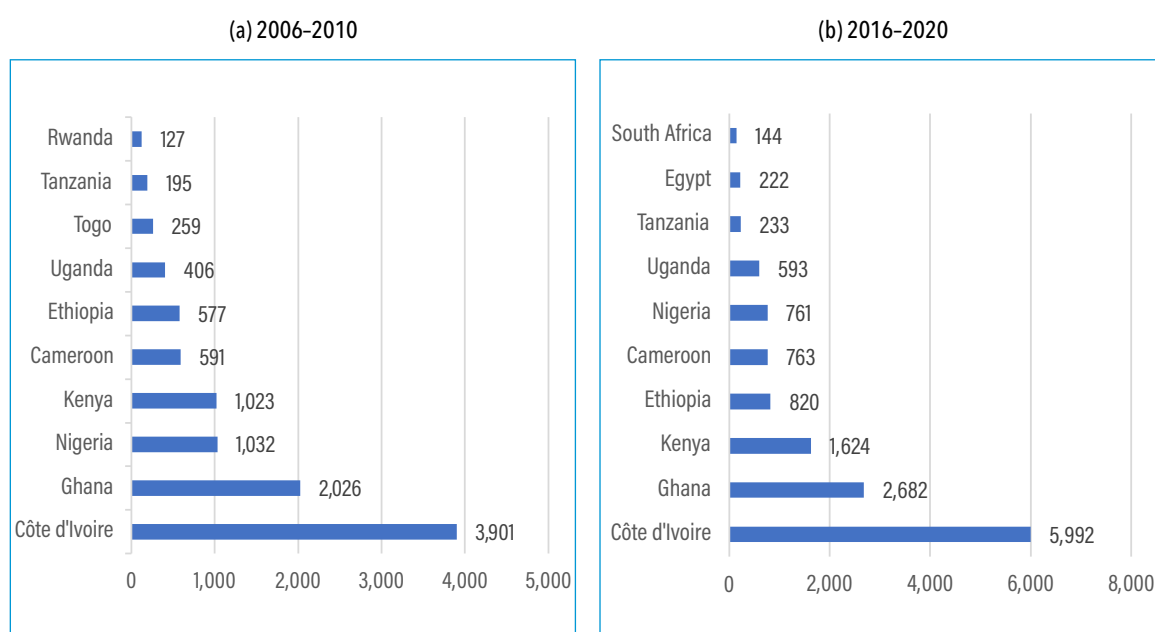
Source: 2022 AATM database.

<sup>4</sup> For an explanation of the levels of processing of cocoa, coffee, and tea, see Appendix Table A4.1.

<sup>5</sup> Throughout this chapter, \$ refers to US dollars.

Figure 4.4 shows the top 10 African exporters of the three commodities for both periods. It is important to note that total African exports of these products increased from \$10.8 billion in 2006–2010 to \$14.6 billion in 2016–2020. Côte d'Ivoire is the top exporter, followed by Ghana, Kenya, and Ethiopia. Côte d'Ivoire's share of exports among the top 10 exporters rose from 38.4 percent on average to 43.3 percent between the two periods. Together, Côte d'Ivoire and Ghana account for more than 62 percent of the total exports of the top 10 countries. Egypt is the only North African country ranking among the top 10 exporters, and only in the second period; its entry among the top 10 may be explained by the re-exports of Kenyan tea after packaging and marketing.

Figure 4.4 Top 10 exporters of cocoa, coffee, and tea (US\$ millions)



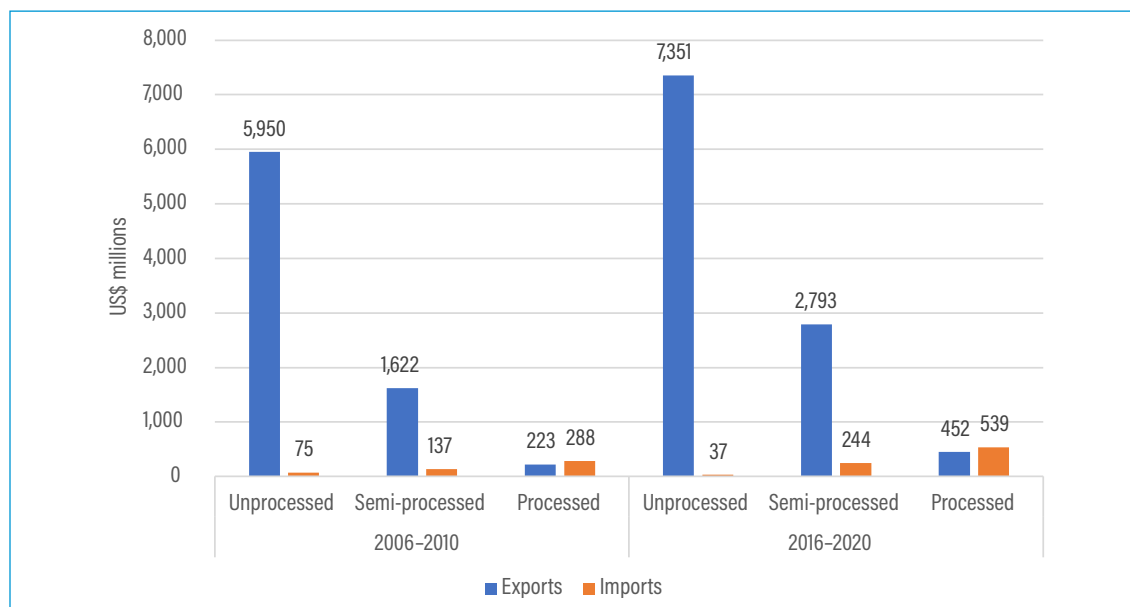
Source: 2022 AATM database.

For a better understanding of trade patterns by level of processing, we look at each commodity separately (Figures 4.5, 4.6, and 4.7).

Figure 4.5 shows cocoa exports and imports by level of processing. Cocoa trade is concentrated in unprocessed exports. These increased by 23.5 percent (from \$5.95 billion to \$7.35 billion) between the two periods. Much of this increase occurred in the first period, when the price of cocoa beans rose from \$1.57 to \$3.07 per kilo, while during the second period, the price remained relatively stable, at about \$2.50 per kilo.<sup>6</sup> Exports of semi-processed and processed cocoa increased faster (by 72.3 and 108 percent respectively) yet continue to constitute a minor share of total cocoa exports. Imports of processed cocoa are only slightly larger than Africa's processed cocoa exports (\$539.16 million and \$451.5 million respectively), suggesting limited variety of chocolate and other food preparations containing cocoa available for domestic consumption, as well as limited consumption overall.

<sup>6</sup> The International Cocoa Organization (ICCO)'s daily prices of cocoa beans can be found at: <https://www.indexmundi.com/commodities/?commodity=cocoa-beans&months=240>.

Figure 4.5 Cocoa exports and imports, by level of processing

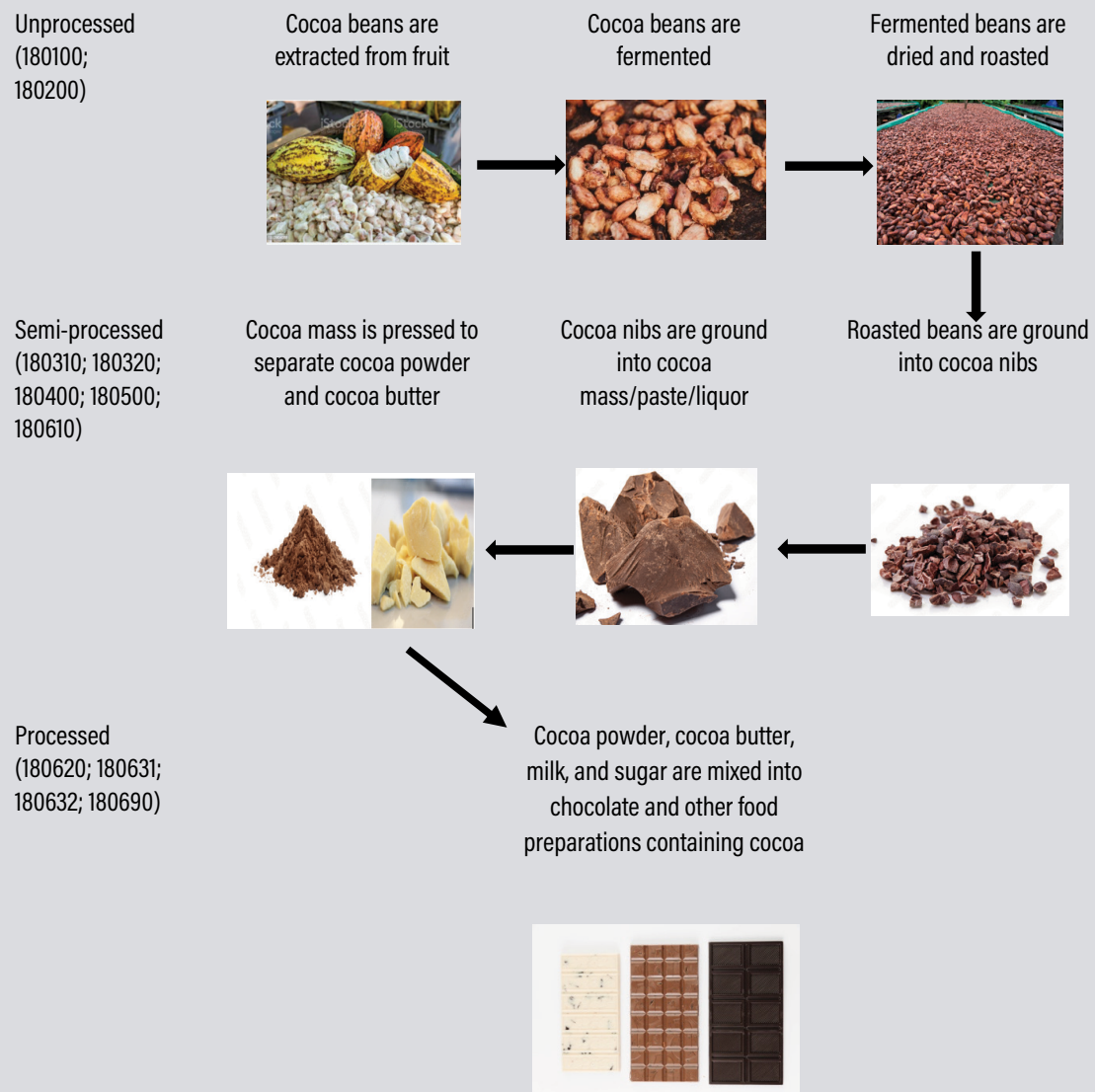


Source: 2022 AATM database.

The cocoa value chain is complex and capital intensive. On the upstream end, about 90 percent of cocoa is grown by geographically dispersed smallholders (UNCTAD 2019). On the downstream end, cocoa processing and chocolate manufacturing are concentrated among a small number of large and increasingly vertically integrated multinational firms (Fold and Neilson 2016). Chocolate manufacturing is characterized not only by advanced technology and logistical requirements but also by fierce differentiation, branding, and marketing strategies. Box 4.1 depicts the processing levels in the cocoa value chain. After the beans are extracted from cocoa buds, fermented, and dried, they are typically exported to undergo the next steps. These include roasting and shelling the beans and then grinding the cocoa nibs into cocoa mass. The cocoa mass is then treated chemically and pressed to separate cocoa butter and cocoa powder, before both products are processed with other ingredients to produce chocolate.<sup>7</sup> African producers face several obstacles to entering into cocoa processing. First, adequate ventilated storage with cool temperatures is required to deal with the region's warm and humid weather conditions. Second, in addition to the lack of efficient logistics, high marketing costs and the difficulties many African countries encounter in meeting quality requirements at competitive costs undermine the potential for African producers to increase their exports of processed cocoa products.

<sup>7</sup> International Cocoa Organization, <https://www.icco.org/processing-cocoa/>

### Box 4.1 The cocoa value chain



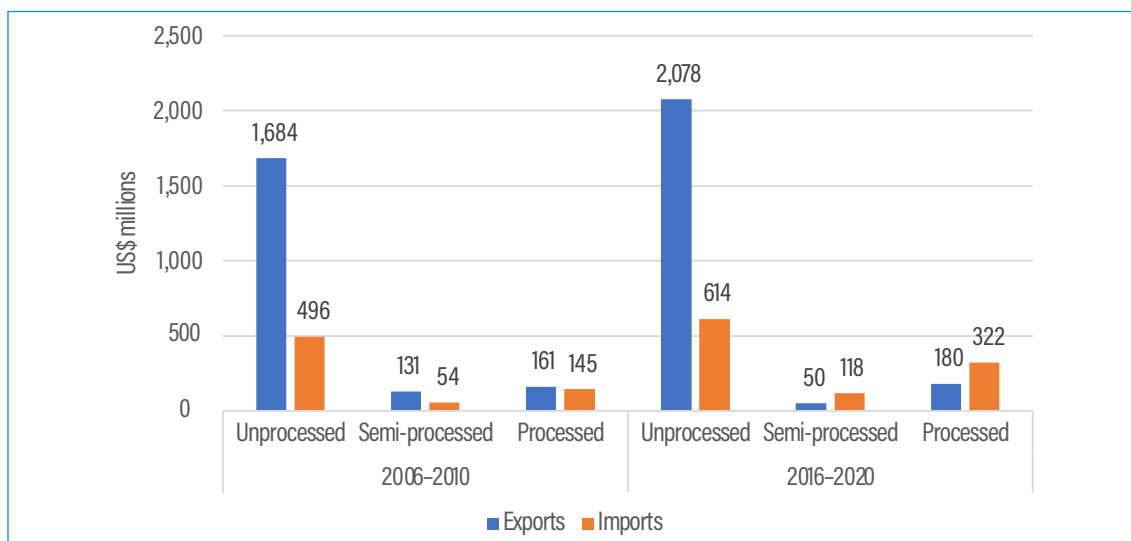
**Source:** Elaborated by authors. Images are from freepik.com. Numbers refer to Harmonized System 6 (HS6) codes.

Two countries offer notable success stories in product upgrading and exports of chocolate: South Africa and Egypt. Both countries engage in chocolate manufacturing and cater to regional markets – South African Development Community (SADC) countries in the case of South Africa and Middle East and North African markets in the case of Egypt. These two countries also serve as regional hubs for confectionery multinationals. Other large cocoa producing countries, including Ghana and Côte d'Ivoire, have also succeeded in upgrading along the cocoa value chain by investing in grinding and exporting cocoa paste and cocoa butter to developed countries (UNCTAD 2019).

Coffee exports and imports by processing level are shown in Figure 4.6. Although the coffee value chain is less complex than that of cocoa, little coffee processing is done in Africa. African exports are concentrated in unprocessed (fermented, dried, and unroasted) coffee beans. These are collected from farmers by cooperatives and traders and shipped abroad. For the

coffee to keep its quality and aroma, the next step (roasting coffee beans) is better performed near the consumer market. Exports of unprocessed coffee increased by 23.5 percent (from \$1.683 billion to \$2.078 billion) between the two periods. At the same time, exports of semi-processed coffee (including roasted coffee beans) dropped substantially from \$131.4 million to \$50.2 million but exports of processed coffee (including but not limited to extracts, essences, and concentrates of coffee) increased slightly from \$161 million to \$180 million. Globally, coffee processing (especially roasting) is dominated by a small number of large firms. The concentration of multinational firms in the roasting industry allows them to capture a substantial share of the difference between international and retail prices (Slob 2006; Ghoshary and Mohan 2021). As in the case of cocoa, the processing of coffee into final products (such as coffee concentrates) requires a level of technical sophistication that many African countries cannot provide on a competitive basis. To compete with famous brands, some African producers try to differentiate their coffee by offering certified organic beans. Imports of unprocessed coffee rose from \$496.4 million to \$613.7 million between the two periods, perhaps as a result of increased intra-African imports, and imports of both semi-processed and processed coffee more than doubled.

Figure 4.6 Coffee exports and imports, by level of processing



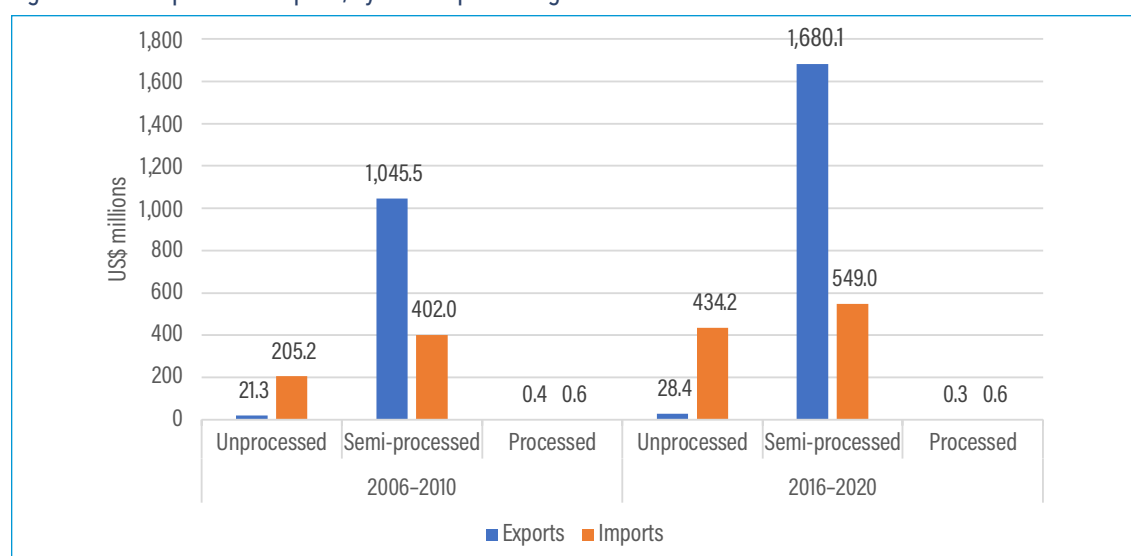
Source: 2022 AATM database.

While the African trade structure for coffee and cocoa is characterized by the concentration of exports in unprocessed commodities, Figure 4.7 shows that trade in tea is different.<sup>8</sup> Exports of unprocessed tea were negligible throughout the study period. The tea value chain is relatively short because the tea leaves require rapid processing. The harvested (green) tea leaves must be picked and transported to the processing factory on the same day to begin the process of fermentation and drying. When the leaves dry, they are cut into smaller pieces (rolled) to promote further oxidation. The leaves are then dried again before being sold to suppliers for packaging and marketing purposes. Given the need for rapid processing, Africa's trade in unprocessed tea may be explained by intra-African trade, especially bulk tea imports by Kenya from neighboring countries for processing, blending, and re-export purposes. Kenya has the largest tea auction in the world (the Mombasa Tea Auction), where a significant proportion of African-grown tea is blended and sold – more than 90 percent of Uganda's and Rwanda's tea exports and more than 40 percent of Tanzania's and Burundi's tea exports are sent to Kenya to be auctioned (UNCTAD 2019).

<sup>8</sup> African trade in unprocessed maté tea is negligible, as this herb is mainly grown, consumed, and exported by South American countries.

Africa's exports of semi-processed (black/fermented) tea rose from \$1.045 billion to \$1.68 billion between the two periods, while imports within the same category rose from \$402 million to \$549 million. African imports of semi-processed tea may be explained by intra-African trade and by North African imports of tea from Asia for blending, consumption, and re-export (Sandrey 2017). According to UNCTAD (2019), the intra-African market accounts for nearly 25 percent of total African tea exports. Egypt and Morocco alone account for nearly half of the continent's tea imports, which are primarily sourced from China, India, and Sri Lanka. There is an increasing trend in differentiation of African tea, as producers offer organic products or certification such as carbon offset labeling as a potential means to generate additional revenue for African firms (FAO 2015).

Figure 4.7 Tea exports and imports, by level of processing



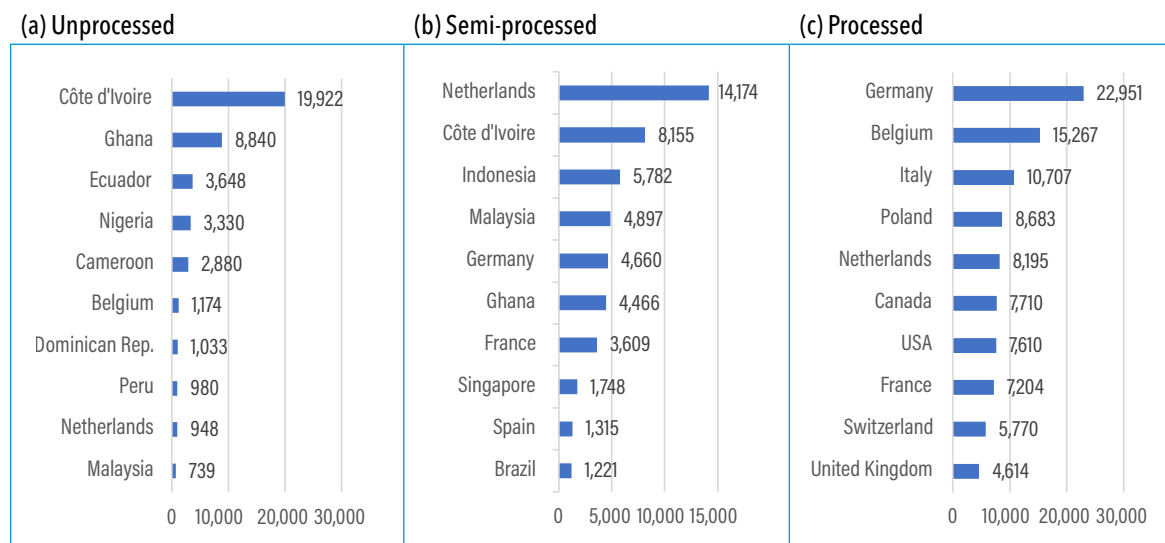
Source: 2022 AATM database.

### Leading exporters of cocoa, coffee, and tea

As a result of the colonial agricultural policy favoring monocropping and Africa's post-independence policies, Africa's export structure remains concentrated, with each country exporting a narrow set of commodities. In line with West Africa's historical leading role in exports of unprocessed cocoa, Côte d'Ivoire and Ghana are the two top exporters, as shown in Figure 4.8. In fact, West and Central Africa was the world's top regional exporter in the early 20th century, and by the early 2000s accounted for over 70 percent of global cocoa exports (Traoré 2009). Belgium and the Netherlands, two of the largest cocoa bean re-export hubs in Europe, appear among the top 10 exporters of unprocessed cocoa. Three South American countries – Ecuador, Dominican Republic, and Peru – are also ranked among the top 10 exporters. Malaysia, the only Asian country on this list, ranks tenth among exporters of unprocessed cocoa worldwide.

The group of top 10 exporting countries of semi-processed cocoa is quite different from that of unprocessed cocoa (Figure 4.8). Only a couple of African countries are among the top 10 exporters: Côte d'Ivoire in second place and Ghana in sixth. The Netherlands dominates the exports within this category, and several other European countries are also ranked among the top 10. Three Asian countries also appear in this ranking as major exporters, likely reflecting the growing chocolate industry in Asia and the related processing of cocoa for re-export and for domestic chocolate production. Exports of processed cocoa (including chocolate) are dominated by European countries, the United States, and Canada.

Figure 4.8 Top 10 exporters of cocoa (US\$ millions), 2016–2020

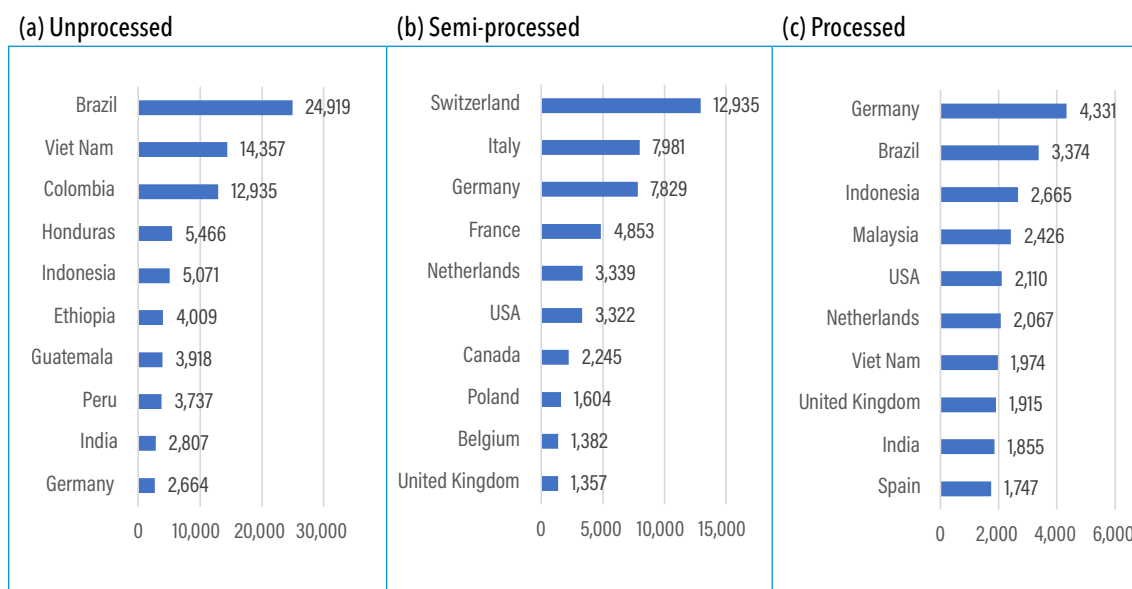


Source: 2022 AATM database.

In the case of coffee, African countries play a smaller role in global markets. Coffee originated in Ethiopia before its consumption spread to Yemen, Asia, and the rest of the world. It was the main export commodity of Ethiopia by the late 19th and early 20th century, and today, Ethiopia is both the leading coffee producer and consumer in Africa (UNCTAD 2018). As shown in Figure 4.9, Ethiopia is among the top 10 exporters of unprocessed (dried) coffee beans worldwide. However, South American and Asian countries dominate the export market: Brazil is ranked first, followed by Viet Nam and Colombia.

Processing and consumption of coffee is concentrated in Europe, Canada, and the United States, and much of the value is captured in roasting, branding, and marketing activities in these countries. Asian and African countries are absent from the list of top 10 exporters of semi-processed (roasted) coffee. As for processed coffee products, African countries are also absent, while four Asian countries (Indonesia, Malaysia, Viet Nam, and India) appear in the ranking.

Figure 4.9 Top 10 exporters of coffee (US\$ millions), by level of processing (2016–2020)



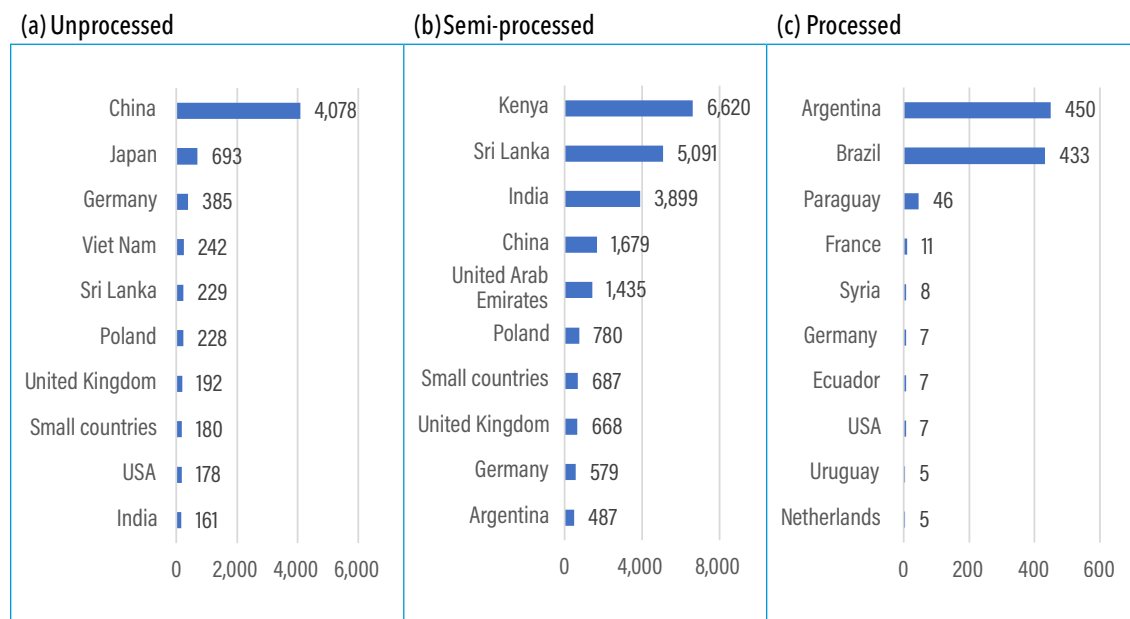
Source: 2022 AATM database.

As for exports of tea, unsurprisingly, China, where tea originated, is by far the largest exporter of the unprocessed commodity (Figure 4.10). For semi-processed (black, fermented) tea, Kenya is the top exporter, followed by several Asian countries (Sri Lanka, India, China, and the United Arab Emirates). In Africa, tea was first commercially grown in Malawi, before British settlers brought it from India to Kenya (Sandrey 2017).<sup>9</sup> Under colonial rule, tea growing expanded to other African countries such as Uganda, Tanzania, Zimbabwe, and in the West, Cameroon (Dufrêne 2019). Kenya's predominance as a major global and African exporter of tea can be explained by the role of the Mombasa tea auction. Tea grown in neighboring countries is imported by Kenya, blended, and re-exported through the auction. African production constitutes a vital part of the global tea trade with 33 percent, the largest regional share. As for processed tea (*maté*), the export market is dominated by Brazil and Argentina, as the *yerba maté* plant is native to South America. The presence of European countries, the United States, Canada, and Syria<sup>10</sup> among the top 10 exporters can only be explained by re-exports of imported *maté*.

<sup>9</sup> Commercialization of tea began in Kenya in 1924 (FAO 2015) when the tea companies Brooke Bond and Finlay acquired fertile land areas of Mount Kenya and the Rift Valley for large-scale tea growing. The companies strictly controlled prices and quantities in favor of Asian-grown tea and applied tea restriction schemes. Later, they controlled the market through an international tea agreement (Ndege 2021). In the late 1950s, the Kenya Tea Board was established to regulate tea production. After Kenyan independence in 1963, land reforms enabled small farmers (previously prohibited from growing tea) to enter the sector (FAO 2015).

<sup>10</sup> *Maté* tea was first introduced to the Middle East with the return of Syrian and Lebanese migrants from South America who brought the herb and the necessary tools to prepare it. Since then, it has become one of region's established drinks (especially among Alawite and Druze communities). Syria is the second-largest importer of *maté* tea (Sulaiman et al. 2021). This ranking could indicate that Syria re-exports *maté* tea regionally (especially to Lebanon). For more information, see Sulaiman et al. (2021).

Figure 4.10 Top 10 exporters of tea (in US\$ millions), by level of processing (2016–2020)



Source: 2022 AATM database.

Note: “Small countries” is an aggregation of small economies and undesignated zones not explicitly specified in the database (such as Andorra, Saint Maarten, etc.).

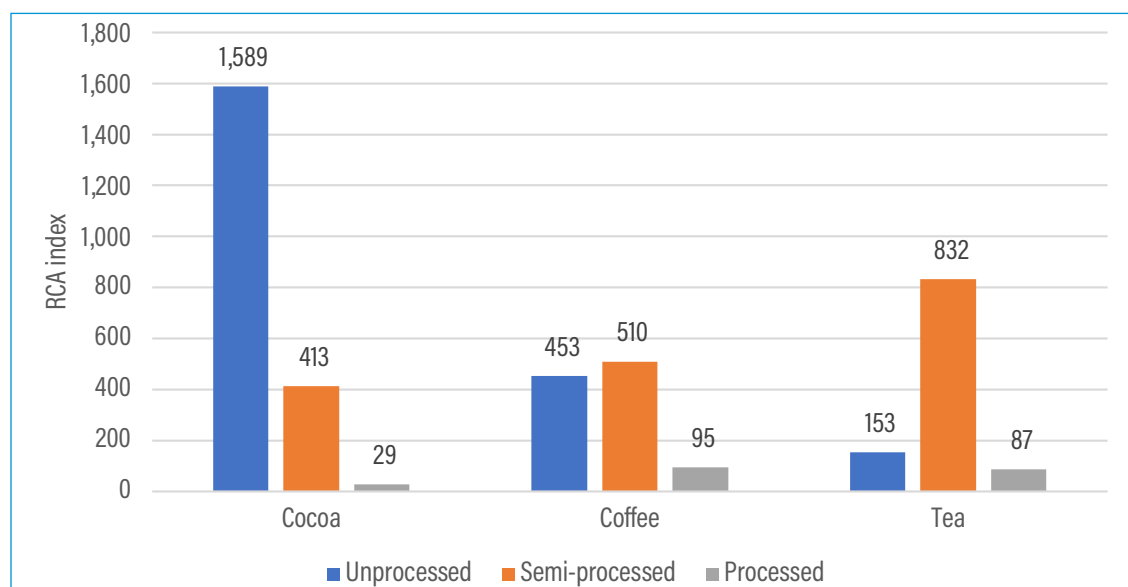
### Revealed comparative advantage

Figure 4.11 shows the average revealed comparative advantage (RCA) index<sup>11</sup> for African exports of the three commodities by level of processing (an index greater than 1 indicates a comparative advantage). Unprocessed cocoa has the highest RCA index. This is not surprising, given the dominant role of West African countries (such as Côte d’Ivoire and Ghana) in the trade of unprocessed cocoa beans. Thanks to Kenya’s leading role in tea exports, the region’s RCA index is particularly high for semi-processed (black/fermented) tea. In line with African countries’ global ranking in the exports of unprocessed coffee and semi-processed cocoa, these RCA indices are also high. The RCA index is also high for semi-processed coffee despite the absence of Africa from the top 10 global exporters. For processed products, African countries also have a relatively high RCA index. However, given Africa’s modest processed exports, the values of the index are significantly lower than those for unprocessed and semi-processed goods.

11 The revealed comparative advantage (RCA) index compares the share of one product in a country’s total exports to the share of the same product in world exports. We use the RCA index defined by Balassa (1965), in which the RCA of country  $r$  for product  $k$  is measured by the product’s share in the country’s exports in relation to its share in world trade. Let  $X_{rs}^k$  be the trade flow of product  $k$  from country  $r$  to country  $s$ . With a dot meaning a summation,  $X_r^k$  is total exports of country  $r$  and  $X_{..}^k$  total world exports. Thus, the RCA of country  $r$  for product  $k$ ,  $RCA_r^k$ , is measured by the share of the

product in the country’s exports compared to its share in world trade as:  $RCA_r^k = \frac{X_r^k / X_{..}^k}{X_r^k / X_{..}^k}$ , with  $X_r^k$  and  $X_{..}^k$  as the values of country  $r$ ’s exports of product  $k$  and world exports of product  $k$ .

Figure 4.11 African revealed comparative advantage, by level of processing



**Source:** 2022 AATM database.

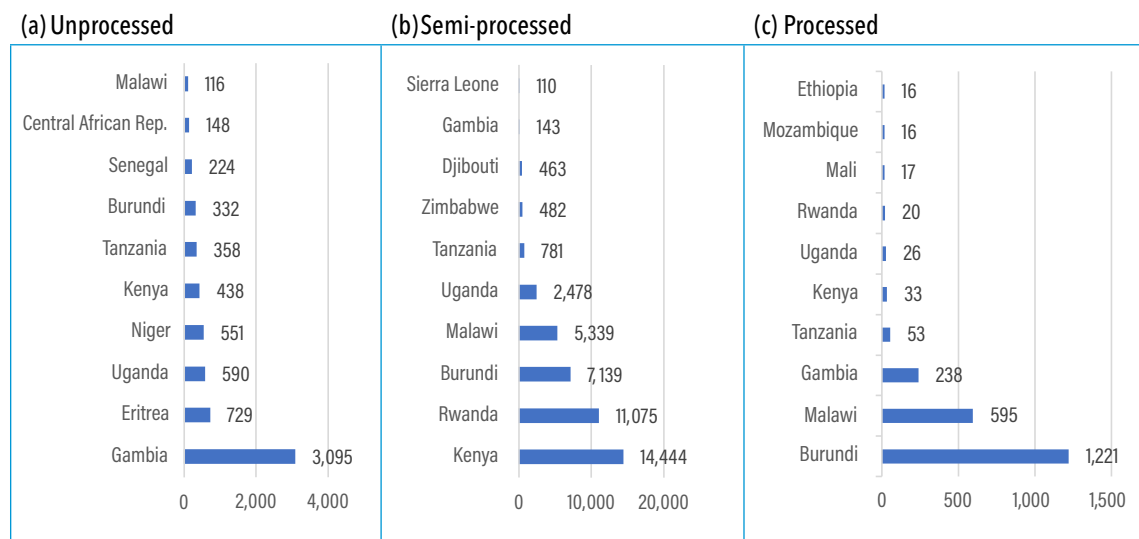
**Note:** Figures are the average over 2003–2020. An RCA greater than 1 indicates a revealed comparative advantage (RCA).

At the country level, countries with the highest RCA scores for exports of unprocessed cocoa are primarily West African countries, with Sao Tome and Principe ranked first, followed by Côte d'Ivoire and Ghana (Figure 4.12). In semi-processed cocoa, West African countries, including Côte d'Ivoire and Ghana, and also East African countries including Ethiopia, have high RCA scores. Finally, in processed cocoa, West African countries (Sao Tome and Principe, Côte d'Ivoire, and Sierra Leone) occupy the top ranks. Two North African countries, Egypt and Tunisia, also appear among the 10 countries with the highest RCA scores for processed cocoa, likely explained by their production and export of chocolate and food preparations containing cocoa to regional markets in the Middle East and North Africa and in sub-Saharan Africa. It is worth noting that the RCA scores for cocoa are significantly lower at higher processing levels, reflecting the concentration of African exports in unprocessed cocoa. Recently, the International Cocoa Council announced that Nigeria, Côte d'Ivoire, Ghana, and Cameroon produced more than 70 percent of the global cocoa supply, but that less than 1 percent of chocolate comes from Africa (Davis 2020).



processing, leaving little room for unprocessed exports. The indicator reveals a comparative advantage for Kenya at the three processing levels, as well as the highest RCA for semi-processed tea. Other East African and Southeast African countries, including Rwanda, Burundi, Malawi, and Uganda, also have high RCA scores. For processed (maté) tea, Burundi has the highest RCA score, followed by Malawi and Gambia.

Figure 4.14 Revealed comparative advantage of top 10 countries for tea, by level of processing



**Source:** 2022 AATM database.

**Note:** Figures are average over 2003–2020. An RCA greater than 1 indicates a revealed comparative advantage.

## Major Trade Partners

Figure 4.15 shows the share of the top 10 export destinations for unprocessed, semi-processed, and processed cocoa. These top 10 markets account for more than 80 percent of African exports of unprocessed and semi-processed cocoa beans and more than 66 percent of processed cocoa products. The Netherlands, home to one of the world's largest cocoa-grinding industries (CBI 2021) is the leading export destination for unprocessed cocoa, accounting for 20.6 percent on average during the first period and 28.1 percent on average during the second period. Top European importers include Germany, Belgium, and France. The United States is also among the top importers of unprocessed African cocoa, with a share of 10.8 percent on average in the first period and 11.9 percent in the second period. One of the emerging export destinations among Asian markets is Malaysia, whose share in unprocessed cocoa exports increased from 4.0 to 7.5 percent between the two periods.

For Africa's semi-processed cocoa, the top 10 export destinations are European countries, the United States, and Canada. The Netherlands is again the top destination for African exports (with more than 24.0 percent of Africa's exports during both periods), followed by France (16.1 percent), the United States (9.0 percent), and Germany (7.1 percent).

The market for processed cocoa products (chocolate) has a different, more diversified structure that includes OECD and non-OECD countries. While the main importer is France (with a share of 26.8 percent), several Arab countries also import processed cocoa products from Africa. These include Saudi Arabia (11.6 percent), the United Arab Emirates (7.2 percent), and Kuwait, Jordan, and Iraq with smaller shares. The leading exporter of processed cocoa products to the Middle East and North Africa region is Egypt (UNCTAD 2019). Poland and the United States

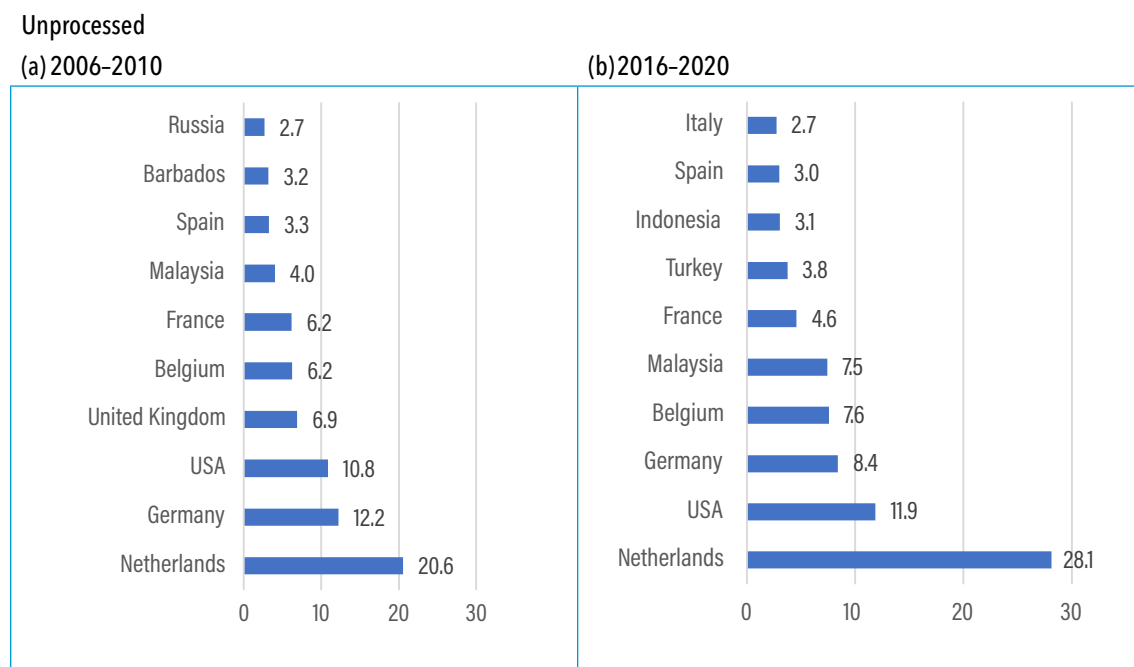
are also among the top 10 importers, though with relatively minor shares. Overall, the top 10 importers of chocolate account for two-thirds of African processed cocoa.

As for the coffee export market (Figure 4.16), Germany is the top importer of unprocessed (unroasted) coffee beans. Its average share decreased from 18.6 percent in the first period to 14.1 percent in the second period. The United States moved up from third to second ranked with an increase of its share from 8.3 percent to 12.9 percent. Italy’s share increased from 8.9 to 9.2 percent between the two periods. Together the top 10 importers account for 66.3 percent of total African exports of unprocessed coffee.

The export destinations for semi-processed and processed coffee are more diverse, with Saudi Arabia as the leading importer of semi-processed coffee (16.2 percent), followed by Namibia and Botswana (9.1 and 8.9 percent respectively). The changes in the top 10 list of importers between the two periods reflect reduced concentration in OECD countries and a larger presence of developing countries.

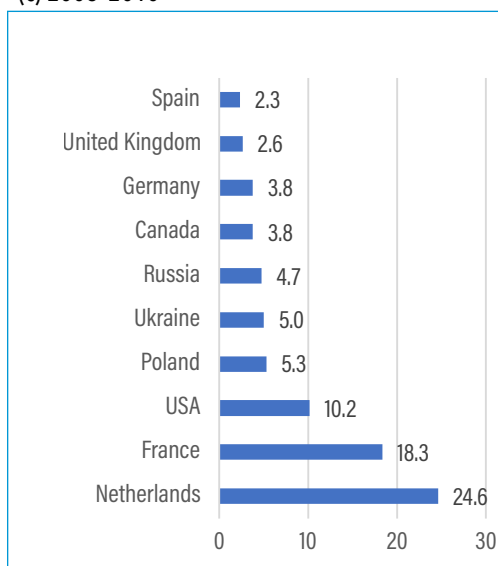
The export destinations for processed coffee exports also differ, with minimal presence of OECD countries. During the first period, Greece was the leading importer of processed coffee from Africa, with a share of 21.8 percent, but during the second period, the top 10 market destinations are all African and Middle Eastern countries. This may indicate the challenges facing African exporters in accessing OECD markets. Standards are less stringent in developing countries, which opens the door for export destinations beyond Africa’s traditional trade partners.

Figure 4.15 Destination of African cocoa (%), by level of processing

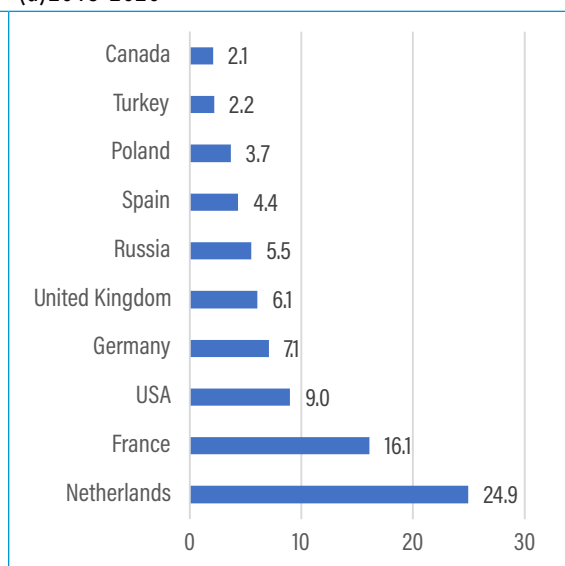


## Semi-processed

(c) 2006–2010

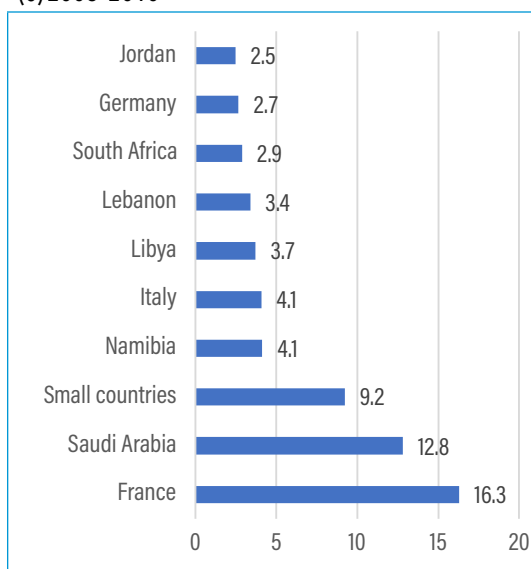


(d) 2016–2020

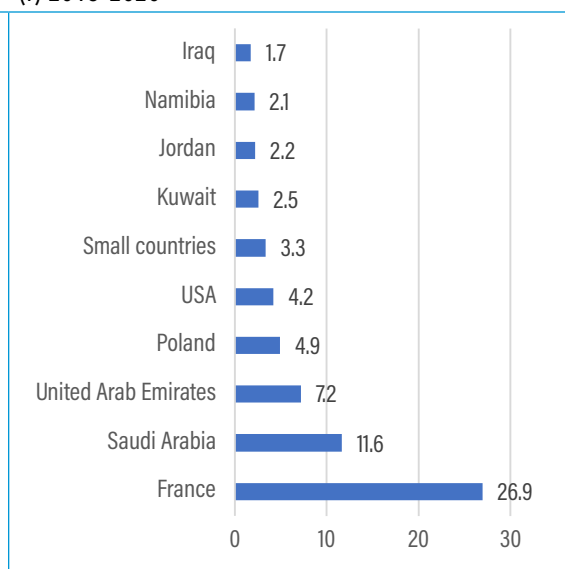


## Processed

(e) 2006–2010



(f) 2016–2020



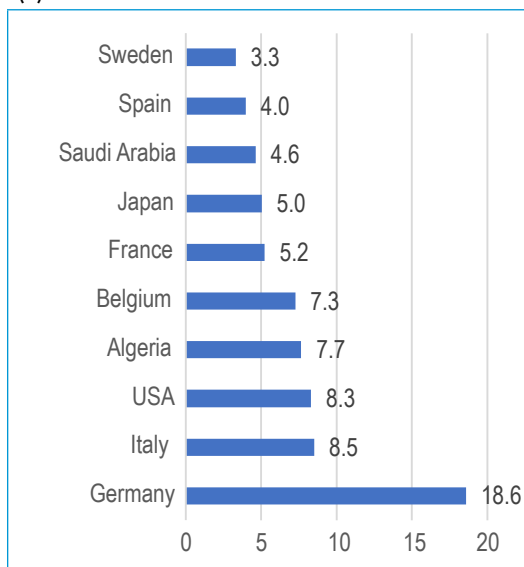
**Source:** 2022 AATM database.

**Note:** "Small countries" is an aggregation of small economies and undesignated zones not explicitly specified in the database (such as Andorra, Saint Maarten, etc.).

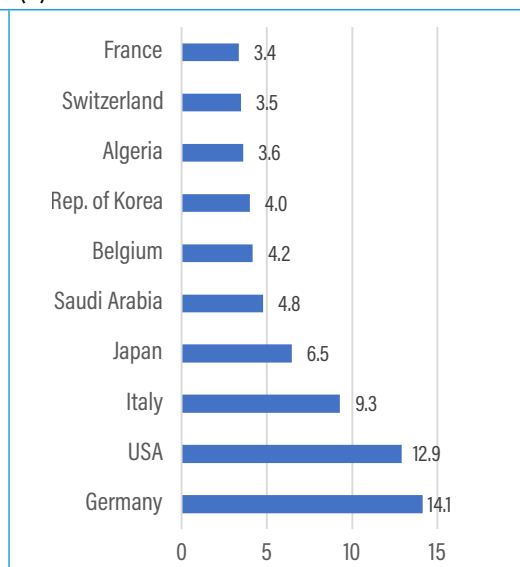
Figure 4.16 Destination of African coffee (%), by level of processing

Unprocessed

(a) 2006-2010

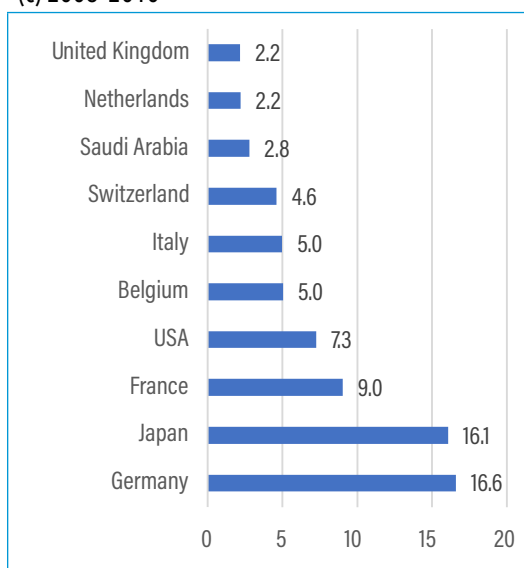


(b) 2016-2020

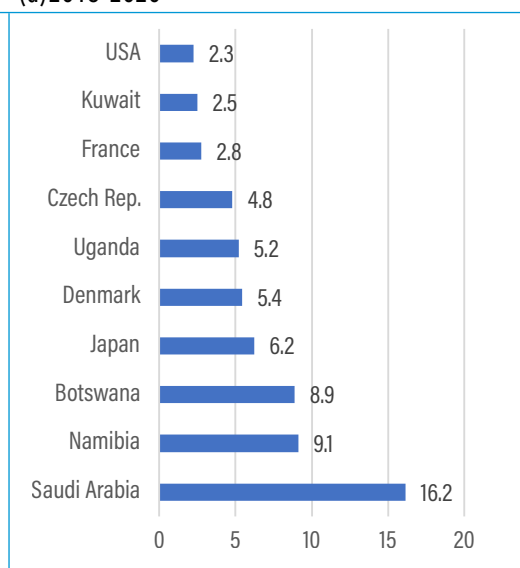


Semi-processed

(c) 2006-2010

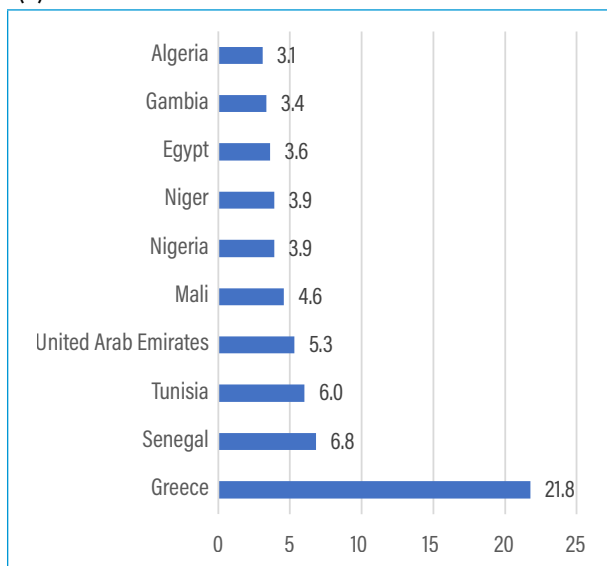


(d) 2016-2020

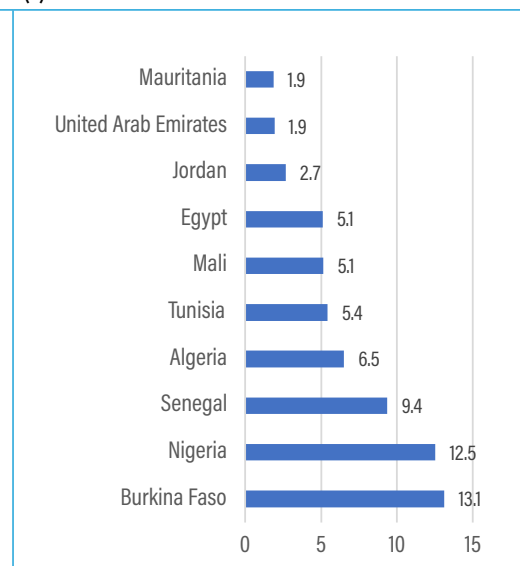


## Processed

(e) 2006-2010



(f) 2016-2020



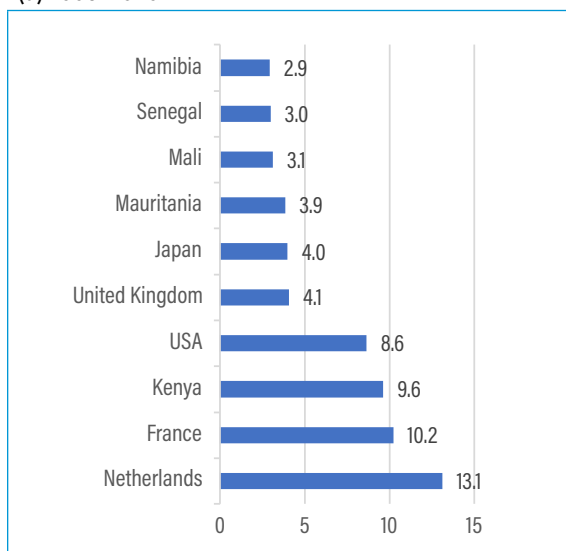
Source: 2022 AATM database.

Market destinations for African tea exports are more diversified than those of coffee and cocoa (Figure 4.17). Between 2006 and 2010, leading importers were the Netherlands, France, Kenya, and the United States. By the 2016–2020 period, China became the major importer of unprocessed tea from Africa, followed by the United States, Kenya, and several European, African, and Middle Eastern countries. For semi-processed tea, the first period was marked by the leading role of the United Kingdom, which imported more than 20 percent of Africa’s total tea exports, followed by Pakistan (18.1 percent) and Egypt (11.7 percent). During the second period, Pakistan became the major export destination, accounting for almost one-third of Africa’s total tea exports. Egypt’s share also increased, up from 11.7 to 14.1 percent, while the UK share dropped from 20.2 to 13.1 percent. Finally, markets for Africa’s processed tea exports are concentrated in the United States, Japan, Ireland, and other OECD countries.

Figure 4.17 Destination of African tea (%), by level of processing

## Unprocessed

(a) 2006-2010

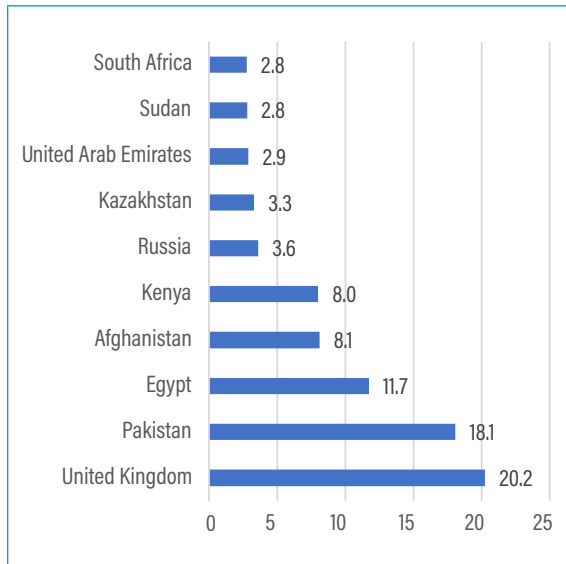


(b) 2016-2020

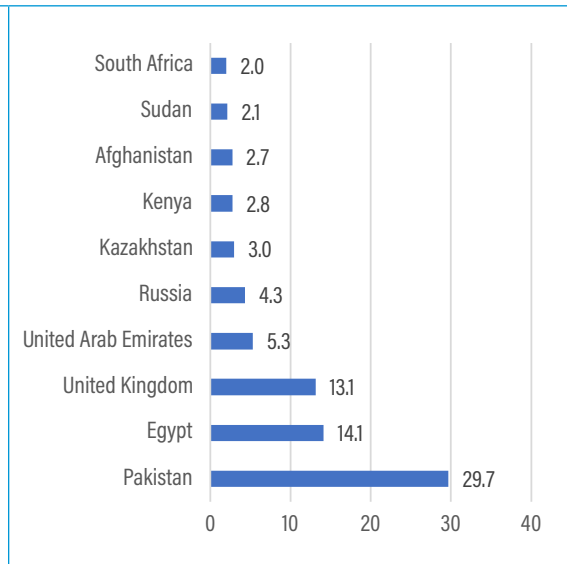


### Semi-processed

(c) 2006-2010

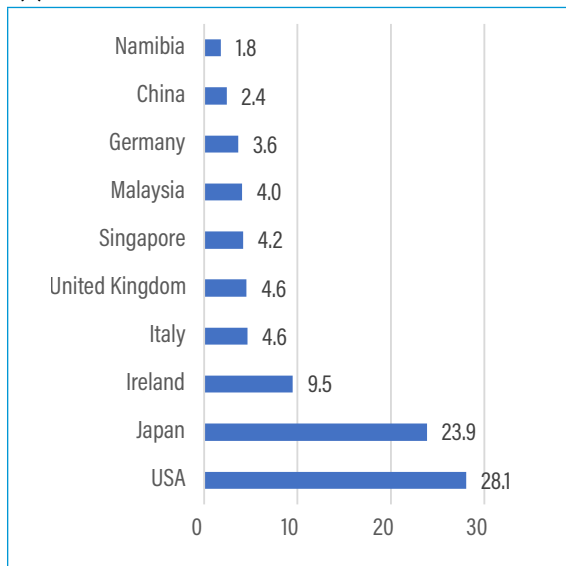


(d) 2016-2020

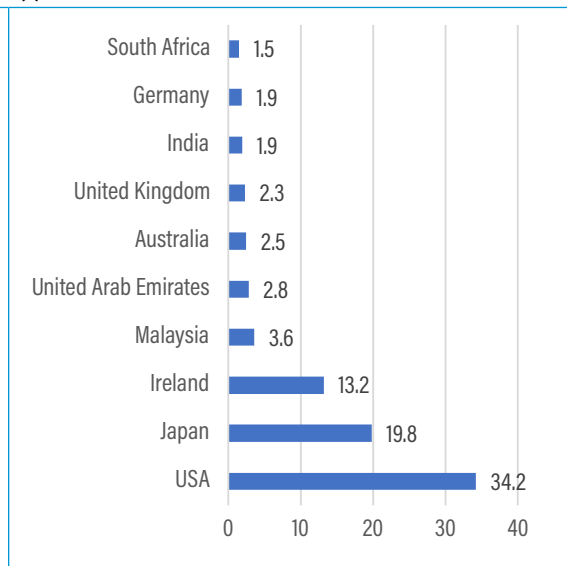


### Processed

(e) 2006-2010



(f) 2016-2020



Source: 2022 AATM database.

Following this presentation of the main trends in export composition and destinations for cocoa, coffee, and tea, it is important to consider to what extent African countries are under-trading or over-trading. This will allow us to assess their actual trade performance relative to their export potential.

## DO AFRICAN COUNTRIES FULLY EXPLOIT THEIR POTENTIAL?

To answer this question, the trade literature uses models to estimate the predicted trade (based on countries' economic fundamentals) for comparison with the actual trade between countries. If predicted trade is more than actual trade, then the country is said to be under-trading and there is untapped trade potential. Here we compare actual trade in cocoa, coffee, and tea with what it should be (given its determinants) to evaluate trade performance.

As discussed above, African exports are concentrated in tropical commodities like cocoa, coffee, and tea. Historically, the beverages sector has played a very significant role among Africa's food exports. According to 2022 AATM data, the African share of global cocoa exports has averaged 70 percent, coffee exports have averaged 12 percent, and tea, 30 percent. Yet despite these substantial shares in global trade, some important concerns about Africa's international trade remain. These interrelated themes relate to:

*Level of trade relative to the potential.* This is the issue of under-trading mentioned above. Trade potential is estimated based on determinants of trade, including factors such as a country's incomes, infrastructure, institutions, remoteness, and most importantly, international, global, and domestic policies, referred to collectively as the "fundamentals." Trading below potential calls for policy actions to close the gap between actual and potential trade to maximize the gains from exports of these commodities. Trading above potential, however, may not mean that trade performance is adequate. Trade potential is itself determined based on fundamentals like infrastructure, institutions, other trade facilitators and inhibitors. If these fundamentals are weak, then the assessed potential trade can be low, and the actual trade could well exceed the trade potential. In such a case, the level of exports in absolute terms should also be considered.

*Share of value accruing to exporter.* When processing, packaging, and branding are done largely by the importer, then a comparatively small share of the final value goes to the exporter. Pairing actual trade with the estimated potential across products by level of processing gives an idea of how much value accrues to the exporter relative to the potential. Cocoa, specifically, is the essential ingredient for chocolate. In tea and coffee also, there are region-specific quality premiums that accrue at the level of final product sales after processing (Gautier 2006). As the discussion above shows, the level of processing in traded products also reflects the persistence of colonial links. Hence, there is reason to look at both trade potential and performance of African trade with ex-colonizers in Europe separately from other traders.

*Market shifts across countries and regions.* With socioeconomic, technology, and demographic changes, changes have also occurred in the demand and supply centers, their levels, and composition. The rapid economic growth in emerging economies necessitates assessment of trade in those country groups and regions. As shown above, this is reflected in high or rising trade with regions like the Middle East and Southeast Asia (particularly Malaysia). Among exporters as well, there are changes, as illustrated by market reallocation in the case of coffee, with the reemergence of Côte d'Ivoire, the sustained dominance of Ethiopia, and fluctuations in Uganda's exports. Market shifts are also occurring because of compositional changes, like greater demand for specialty and certified organic coffee beans. In the face of global price fluctuations for cocoa, coffee, and tea, developing Africa's internal market for these products is also important and requires an assessment of intra-African trade.

## Assessing actual trade relative to potential trade

As discussed above, the first step in assessing the trade performance of an exporter for a particular product is to estimate the trade potential; estimated trade potential provides a benchmark or scale for measuring performance. When a country exports less of the product than its predicted potential, this is termed under-trading. If the reverse, then it is over-trading. The technical appendix to this chapter describes the methodology employed for assessing trade performance relative to trade potential, and discusses the inclusion of multilateral trade frictions and accounting for zero trade within the model to ensure accurate measurement of potential.

### Coffee trade

Table 4.1 identifies under- and over-exporting of African countries in coffee products. Considering exports of processed coffee, Ethiopia is under-exporting to Europe and other rich countries. South Africa, a comparatively high-income African country, also exports processed coffee below its potential. In coffee, there is generally no under-trading of the unprocessed product and even some evidence of trading above the predicted potential.

For processed coffee, however, quite a few significant producers export below their potential. Apart from the predominance of primary production in the global South and processing in the global North, coffee is among the tropical products where there is substantial competition because many countries are engaged in production and trade. Liberia, for example, used to be the primary producer of Liberica coffee; now Robusta is Liberia's primary coffee crop but with almost no exports, because it is outcompeted in this variety by Southeast Asian countries. Nigeria and Sierra Leone had traditional coffee sectors that, for different reasons, never recovered from past downturns.<sup>12</sup> Even for large African producers like Rwanda and Ethiopia, when it comes to processed coffee and intra-African trade, trading is below potential.

Table 4.1 shows a clear stratification, with African countries exporting at their potential level or more in the case of unprocessed commodities, particularly to the rich countries. As the level of processing increases, it becomes more likely that trading is below potential.

<sup>12</sup> Many reasons have been proposed for the decline of coffee in Nigeria, including the emergence of oil that made many farmers abandon coffee. In addition, lack of market access including branding and product differentiation have led to low investments in coffee that have left coffee plants vulnerable to aging and diseases and have further reduced the prospects for coffee. In Sierra Leone, the long civil war disrupted coffee production and many farmers had to abandon their fields.

Table 4.1 Coffee trade performance of Africa

<i>Processed coffee</i>		
OECD	Europe	Africa
<i>Under-trading</i>		
1. Côte d'Ivoire 2. Ethiopia 3. Ghana 4. South Africa	1. Côte d'Ivoire 2. Ethiopia 3. Ghana 4. South Africa	1. Djibouti 2. Ethiopia 3. Rwanda 4. Malawi
<i>Over-trading</i>		
1. Madagascar	1. Madagascar	1. Botswana 2. Rep. of Congo 3. Ghana 4. Zimbabwe
<i>Semi-processed coffee</i>		
OECD	Europe	Africa
<i>Under-trading</i>		
1. Burundi 2. South Africa 3. Algeria 4. Egypt 5. Ghana 6. Gambia 7. Niger	1. Gambia 2. Burundi 3. Kenya 4. Rwanda	1. Rep. of Congo 2. Djibouti 3. Ethiopia 4. Kenya 5. Nigeria 6. Sierra Leone
<i>Over-trading</i>		
		1. Kenya
<i>Unprocessed coffee</i>		
OECD	Europe	Africa
<i>Over-trading</i>		
1. Burundi 2. Rep. of Congo 3. Ethiopia 4. Kenya 5. Mozambique 6. Tanzania 7. Zambia	1. Burundi 2. Rep. of Congo 3. Ethiopia 4. Kenya 5. Mozambique 6. Tanzania 7. Zambia	
<i>Under-trading</i>		
1. Senegal	1. Senegal	

**Source:** Authors' elaboration using regression results from estimates of the gravity model.

**Note:** This table shows the African countries that are under- and over-exporting to the OECD, Europe, and Africa. For example, Côte d'Ivoire is under-trading processed coffee with the OECD and Europe, while Madagascar is over-trading processed coffee with these regions.

## Cocoa trade

Africa's cocoa trade, like its coffee trade, is characterized by subpar performance in processed products (Table 4.2). Among the big producers of cocoa, Cameroon trades below potential in processed cocoa and its trade performance is relatively weak in unprocessed cocoa in OECD markets. Apart from Cameroon, the other three big cocoa producers in Africa are either trading at the expected level or over-exporting unprocessed cocoa.

Recall that in the case of processed products like chocolate, a country need not be a producer of the raw material (cocoa in this case) to be an exporter. However, the largest cocoa producers, Côte d'Ivoire and Ghana, have been crushing, roasting, and grinding cocoa beans into the unsweetened cocoa mass used to manufacture chocolate for some time and exporting this semi-processed cocoa. Ghana has raised its cocoa processing capacity, reaching 400,000 tons in 2019 (Van Huellen and Abubakar 2021). In Madagascar, where cocoa exports now surpass \$20 million (with a government target of \$35 million), the emphasis on processed and semi-processed cocoa exports may lead to trade at or above the estimated potential.

Rwanda exports very little processed cocoa and is clearly under-trading even with African partners. As part of the government effort to increase value capture in the cocoa value chain, Ghana is collaborating to establish a chocolate processing plant in Rwanda, which is intended to boost trade and investment between the two countries (Farmers Review Africa 2021). As part of the partnership established in 2021, Ghana will supply processed organic cocoa in the form of cocoa nibs or cocoa liquor, which will be made into chocolate in Rwanda. Arrangements like this can exploit trade opportunities and reduce under-trading within Africa.

Though cocoa is Uganda's fourth largest export (after coffee, tea, and fish), the country tends to under-export processed cocoa, and exports mainly cocoa beans. Côte d'Ivoire, Africa's biggest cocoa producer with 40 percent of the world market, established its first industrial-scale chocolate factory in 2015. Sierra Leone, where the cocoa sector was adversely affected by the civil war, remains an under-trader and trade with Europe remains subpar despite attempts to revive the sector. Sierra Leone opened its first cocoa processing factory in 2021, which has the capacity to process up to a quarter of the country's output. Indeed, in the case of semi-processed cocoa, the incidence of trading below potential is low for African exports in European and OECD markets.

Table 4.2 Cocoa trade landscape

<i>Processed cocoa</i>		
OECD	Europe	Africa
<i>Under-trading</i>		
1. Cameroon 2. Senegal 3. Eswatini 4. Tunisia 5. Zambia 6. Egypt	1. Cameroon 2. Egypt 3. Morocco 4. Sierra Leone 5. Eswatini 6. Tunisia 7. Zimbabwe	1. Côte d'Ivoire 2. Rep. of Congo 3. Madagascar 4. Rwanda 5. Uganda
<i>Over-trading</i>		
1. Côte d'Ivoire 2. Rep. of Congo 3. Madagascar		1. Senegal
<i>Semi-processed cocoa (including inter alia cocoa liquor, cocoa butter, and cocoa powder)</i>		
OECD	Europe	Africa
<i>Under-trading</i>		
1. Uganda 2. Eswatini	1. Egypt	
<i>Over-trading</i>		
1. Côte d'Ivoire 2. Cameroon 3. Rep. of Congo 4. Nigeria 5. Ghana	1. Cameroon 2. Nigeria	
<i>Unprocessed cocoa</i>		
OECD countries	Europe	Africa
<i>Under-trading</i>		
1. Cameroon 2. Central African Republic 3. Nigeria	1. Cameroon 2. Central African Republic 3. South Africa 4. Nigeria	1. Sierra Leone
<i>Over-trading</i>		
	1. Rep. of Congo	1. Madagascar 2. Gambia 3. Nigeria 4. Eswatini

**Source:** Authors' calculations based on gravity model estimates.

**Note:** This table shows the African countries that are under- and over-exporting to the OECD, Europe, and Africa. For example, Cameroon is under-trading processed cocoa with the OECD and Europe, while Côte d'Ivoire is over-trading processed cocoa with the OECD countries.

## Tea trade

Most of Africa's tea production is black tea, as the composition of exports reflects. Africa exports black tea to Asia and Europe and more recently to North America. The top three African producers of tea are Kenya, Uganda, and Malawi. Through branding and dedicated supply to high-end marketers like Marks & Spencer for Kenyan tea, there have been attempts to move up the value chain. Uganda is Africa's second largest tea producer; however, its tea production was badly affected by the period of political turmoil (mostly in the 1970s, with continued effects in 1980s), and has been recovering since political normalcy returned.

Table 4.3 shows Africa's trade performance in unprocessed, semi-processed, and processed tea. Several of Africa's tea exporters under-export. Kenya stands out as exporting more than expected in both unprocessed and semi-processed tea products. The intra-Africa trade performance is below potential for many African countries in the case of semi-processed tea. As much of Africa consumes tea, the main form in which tea is traded matters. For both Uganda and Tanzania, where attempts are being made to revive the tea sector, the under-trading within Africa can be quite significant, reflecting considerable untapped potential.

Table 4.3 Tea trade landscape

<i>Processed tea</i>		
Europe	OECD	Africa
<i>Under-trading</i>		
1. Ethiopia 2. Ghana 3. Egypt 4. Tanzania 5. Zimbabwe	1. Senegal 2. Sierra Leone 3. Zimbabwe	
<i>Over-trading</i>		
	1. South Africa	
<i>Semi-processed tea</i>		
Europe/OECD	Africa	
<i>Under-trading</i>		
No sizable exporter		1. Djibouti 2. Rep. of Congo 3. Egypt 4. Kenya 5. Ethiopia 6. Morocco 7. Sierra Leone
<i>Over-trading (low levels)</i>		
1. Kenya 2. Mozambique 3. Tanzania 4. South Africa 5. Malawi		

<i>Unprocessed tea</i>		
Europe	OECD	Africa
<i>Under-trading</i>		
1. South Africa 2. Niger 3. Senegal 4. Uganda 5. Tanzania	1. South Africa 2. Gambia 3. Senegal 4. Uganda	
<i>Over-trading</i>		
	1. Kenya 2. Mauritius	

**Source:** Authors' calculations based on gravity model estimates.

**Note:** This table shows the African countries that are under- and over-exporting to the OECD, Europe, and Africa. For example, Ethiopia is under-trading processed tea with Europe, while South Africa is over-trading processed tea with the OECD countries.

## THE DETERMINANTS OF UNDER-TRADING

Is under-trading cause for concern, and over-trading a mark of good trade performance? In the assessed under-trading scenario, relatively weaker economic characteristics such as domestic infrastructure and an unfavorable investment climate may predict a lower trade level for a country. Further, over-exporting may indicate the importance of focusing on policies that enhance the country's trade potential. Yet, as highlighted in this chapter, trade in these three commodities is characterized by greater value capture by the importing countries. Thus, steps are needed to allow African exporters to accrue a greater share of the value through processing and other forms of product differentiation.

Beyond the deep impact of Africa's colonial heritage on its present structure of exports, internal and external challenges limit Africa's participation in higher value-added activities in the cocoa, coffee, and tea global value chains. These include restrictive trade policies, challenges related to the quality of institutions and infrastructure, and limited access to technology and know-how. These challenges are briefly discussed below.

### External factors

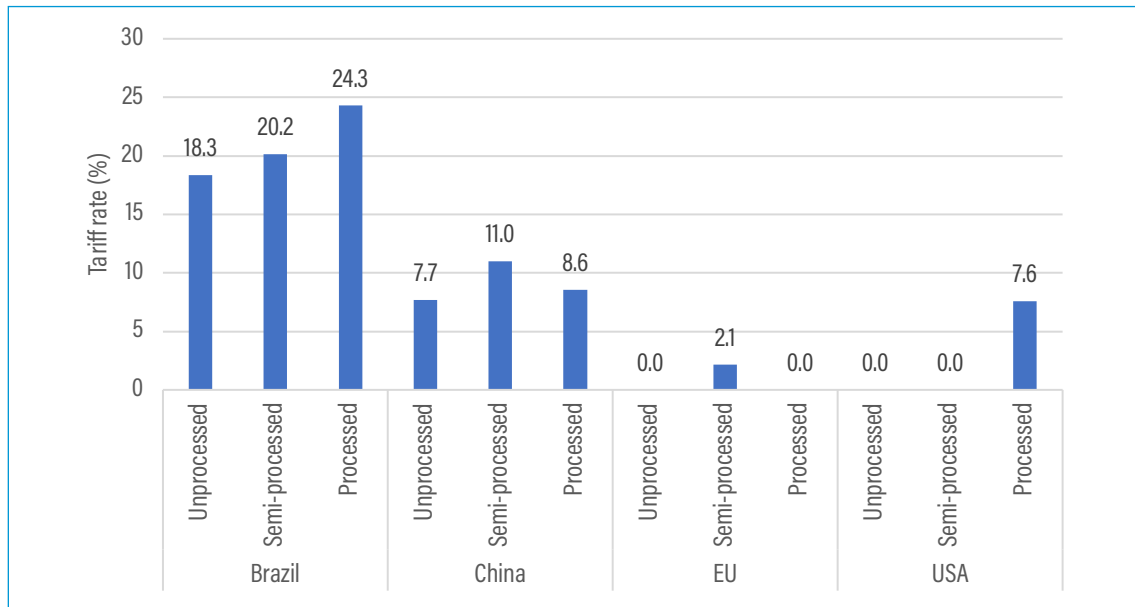
#### Tariff escalation

Escalating tariffs – that is, tariff rates that increase with the level of product processing – are among the main reasons for Africa's lack of export processing and diversification. Although escalating tariffs have declined over time, they remain relatively high in value chains for tropical produce, including cocoa, tea, and coffee.

Figure 4.18 compares tariffs imposed by the EU, the United States, China, and Brazil on cocoa imported from Africa. According to MAcMap-HS6<sup>13</sup> data, unprocessed and processed cocoa exports enjoy a tariff-free entry to EU markets but semi-processed cocoa (cocoa mass, butter, and powder) is subject to a 2.1 percent tariff. The United States, another major trade partner for Africa, imposes a 7.6 percent tariff on processed cocoa imports from Africa. Tariffs imposed by Brazil (a major competitor in cocoa growing and processing) are typically high and escalating (18.3, 20.2, and 24.3 percent for unprocessed, semi-processed, and processed cocoa respectively). China's tariffs on cocoa imports are also relatively high, with a rate of 11 percent on semi-processed cocoa.

<sup>13</sup> The authors thank Houssein Guimbard for providing access to MAcMap-HS6 2019.

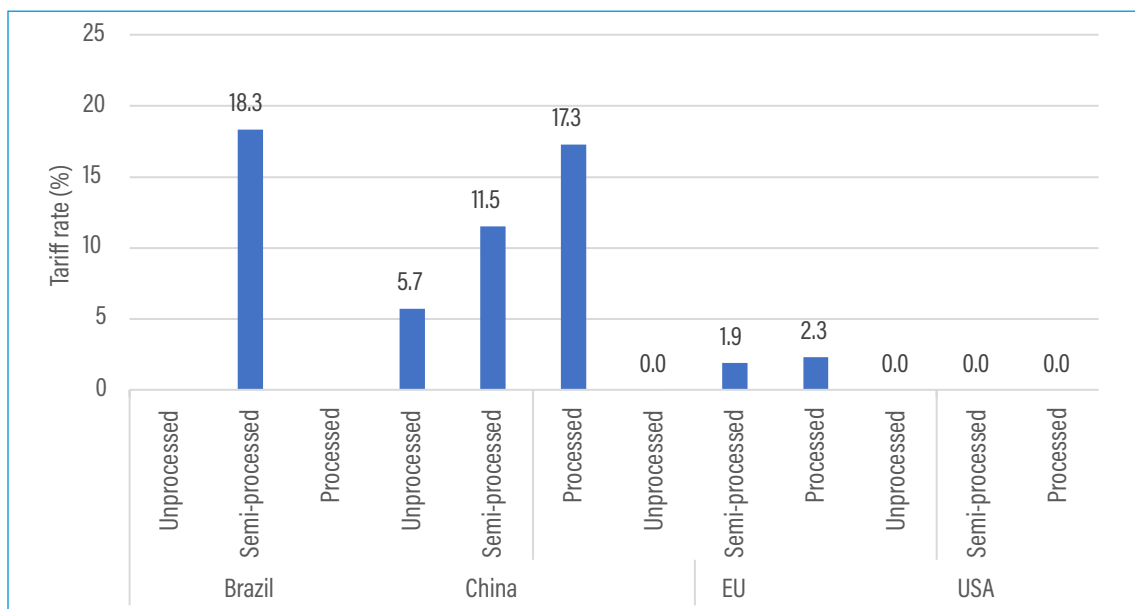
Figure 4.18 Tariff faced by African countries on cocoa, by level of processing, 2019



**Source:** Authors' elaboration using MAcMap dataset.

Tariffs on coffee (Figure 4.19) are highest on semi-processed exports to Brazil (18.3 percent). As in the case of cocoa, China applies escalating tariffs on the imports of African coffee, reaching 17.3 percent for processed goods. Major coffee-importing countries have eliminated tariffs on unprocessed coffee imports but maintain most-favored nation (MFN) tariffs on imports of semi-processed and/or processed coffee. For example, the EU imposes a 1.9 percent tariff on semi-processed coffee and a 2.3 percent tariff on processed coffee. Some African countries have privileged partnership agreements with the EU that allow for tariff-free imports of processed coffee – these include Cameroon, Côte d'Ivoire, Kenya, Tanzania, and Uganda (UNCTAD 2018).

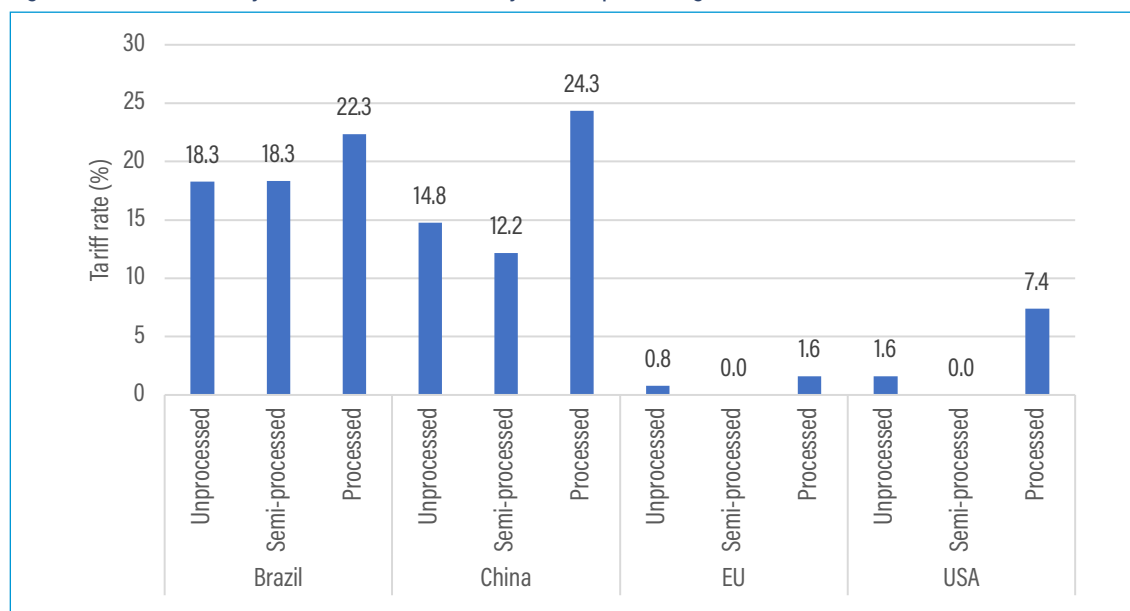
Figure 4.19 Tariff faced by African countries on coffee, by level of processing, 2019



**Source:** Authors' elaboration using MAcMap dataset.

For tea (Figure 4.20), import tariffs are strikingly high in Brazil (18.3 percent on unprocessed and semi-processed tea and 22.3 percent on processed tea). Surprisingly, China, the top importer of unprocessed tea from Africa, sets import tariffs at 14.8 percent. China's tariff rates are also high for semi-processed tea (12.2 percent), and more substantial for processed tea (24.3 percent). The EU imposes a tariff rate of 1.6 percent and the United States 7.4 percent on processed tea. Finally, semi-processed tea enjoys tariff-free entry in EU and US markets.

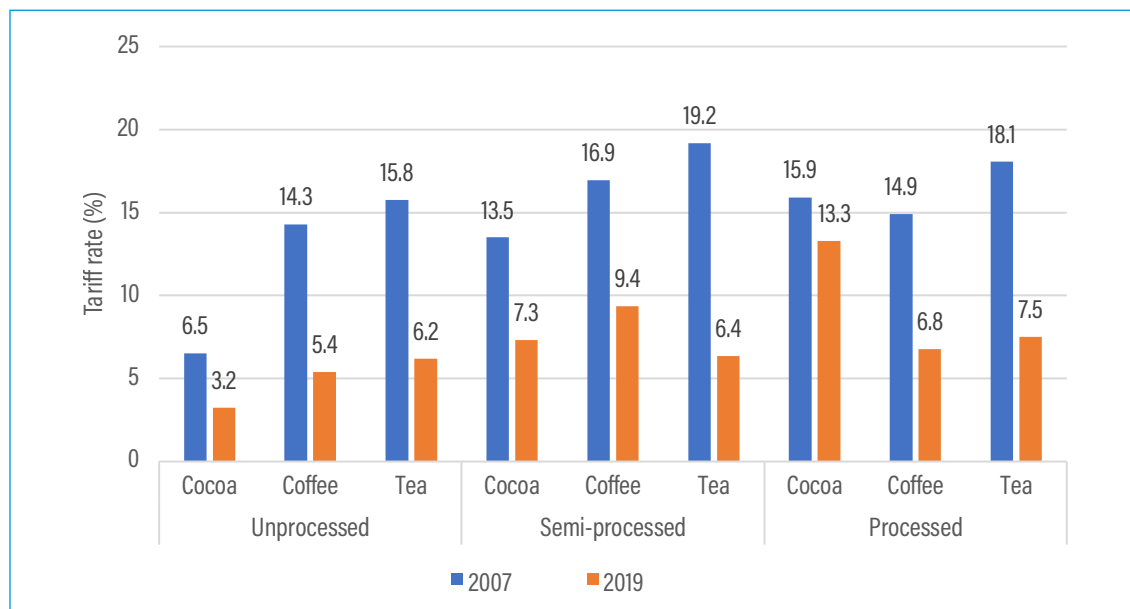
Figure 4.20 Tariff faced by African countries in tea, by level of processing, 2019



Source: Authors' elaboration using MAcMap dataset.

African countries impose high and escalating tariffs on regional trade. Figure 4.21 shows average intra-African tariffs on cocoa, coffee, and tea. In general, tariffs have been lowered over time but remain comparatively high and escalating. For example, tariffs on semi-processed tea are above 6 percent. For cocoa, tariffs increase from 7.3 percent on semi-processed cocoa to 13.3 percent on processed cocoa products. In the case of coffee, semi-processed (roasted) beans are subject to the highest tariff rate in the value chain (9.4 percent). Restrictive intra-African trade policy contributes to the relatively low intra-African trade levels. It also undermines the potential to develop regional value chains with a larger variety of semi-processed and processed products as a stepping-stone to integrating with global chains and competing internationally. In the case of tea, for example, the intra-African market accounts for nearly 25 percent of the continent's total exports. However, the potential to develop regional tea value chains is constrained by the persistence of escalating intra-African tariffs and the different levels of protection maintained by the multiple regional economic communities. Similarly, the cocoa value chain is fragmented. Large cocoa producers export outside of Africa, and countries engaged in chocolate processing source their inputs from outside the continent to benefit from lower preferential tariffs (UNCTAD 2019). In this regard, liberalizing intra-African trade under the umbrella of the African Continental Free Trade Area (AfCFTA) is a necessary step to help African producers increase their competitiveness by accessing a large regional market and "practicing" processing and producing a larger variety of products. Yet, while intra-African tariffs will be removed on most of the products under the AfCFTA, nontariff measures will still need to be addressed, including the simplification of nontariff measures, especially those relating to rules of origin.

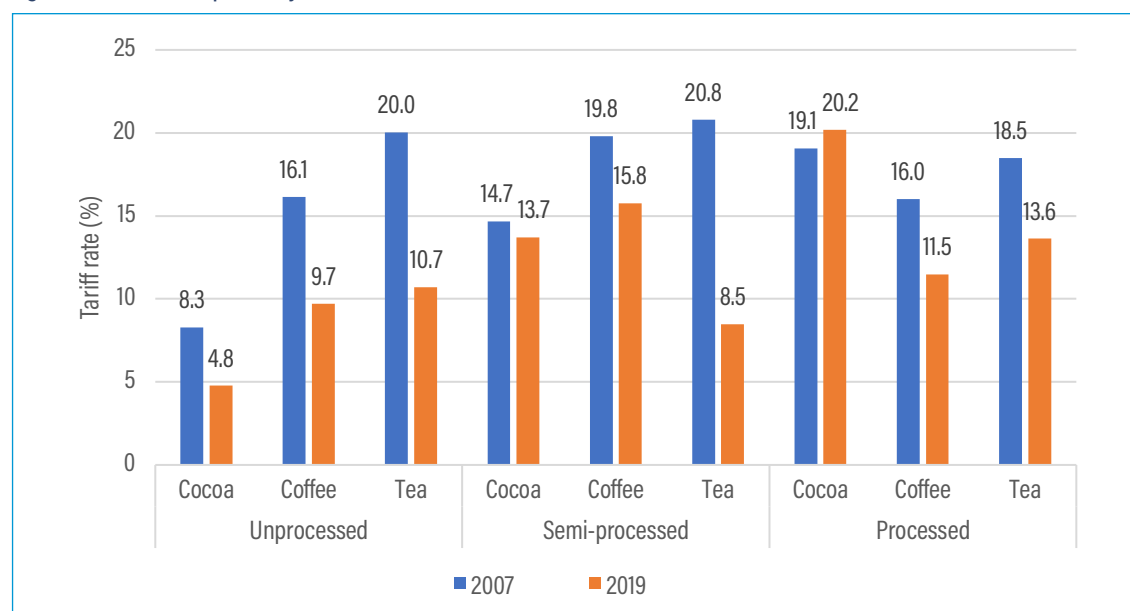
Figure 4.21 Intra-African tariffs, 2007 and 2019



Source: Authors' elaboration using MAcMap datasets.

African countries also impose high import tariffs on products of non-African origin (Figure 4.22). While high tariffs may be justified by the desire to protect local industries from foreign competition, consumers enjoy little product variety as a consequence. Tariffs on imports of cocoa and coffee remain particularly high. For example, tariffs on semi-processed and processed cocoa are as high as 13.7 percent and 20.2 percent, respectively. Moreover, import tariffs on processed cocoa increased by nearly 1 percentage point between the two periods. For coffee, tariffs on semi-processed (roasted) beans and processed coffee products remain high (15.8 and 11.5 percent respectively). Compared to cocoa and coffee, imports of tea are subject to relatively lower tariffs (8.5 percent on the imports of semi-processed tea).

Figure 4.22 Tariffs imposed by African countries on non-African countries, 2007 and 2019



Source: Authors' elaboration using MAcMap dataset.

## Nontariff measures

The past two decades witnessed a proliferation of public and private standards in the EU. Although many developing countries, including African countries, are now adopting many of these standards, they still hinder market access and discourage investment in African processed goods for the purpose of exporting. Smaller firms are more likely to encounter difficulties in meeting exports requirements, especially those related to compliance with standards and certification.

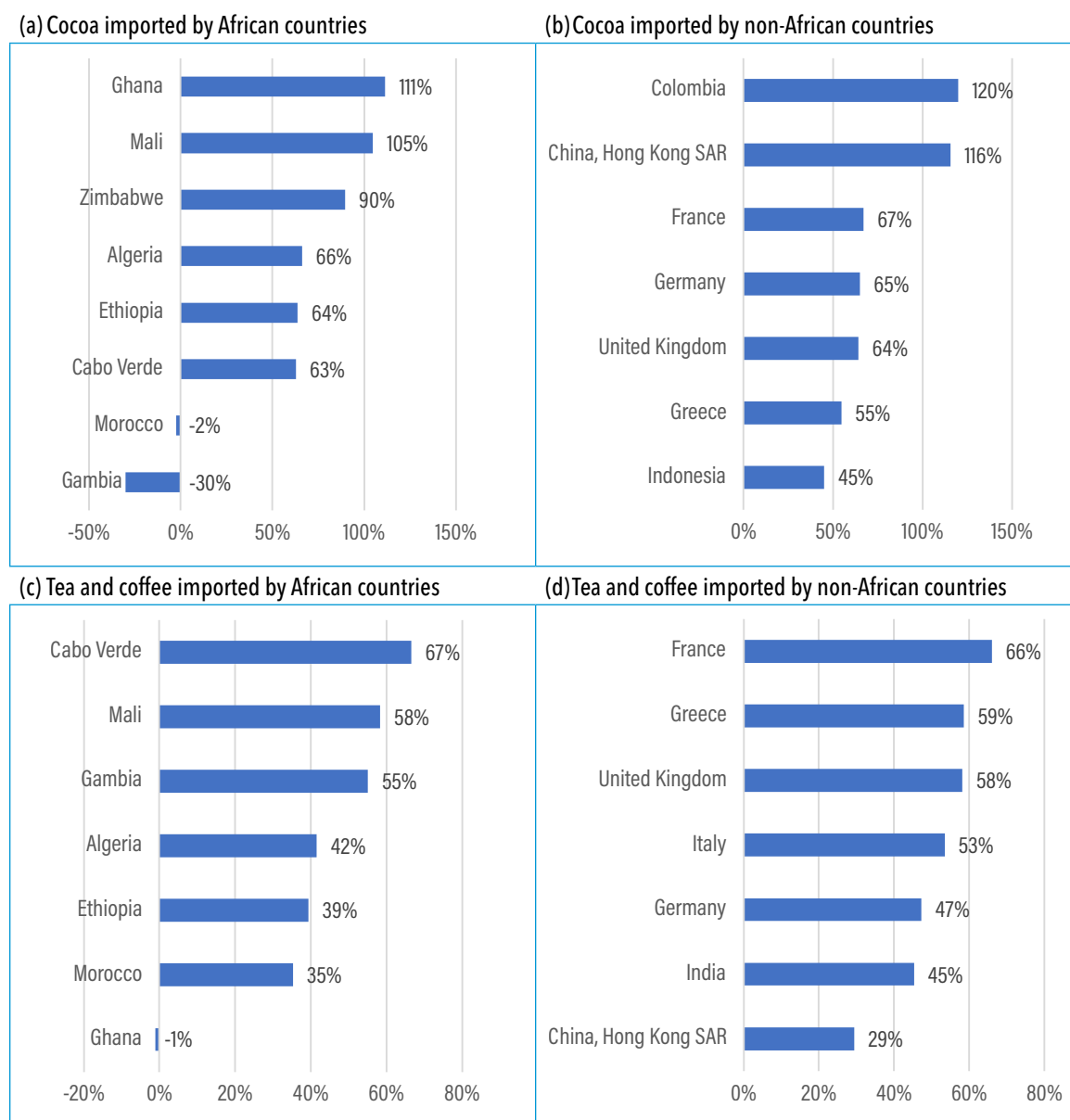
African countries also impose nontariff measures on imports of coffee, tea, and cocoa. While these measures are intended to promote consumer safety, they often provide an implicit means of protecting domestic industries from foreign competition. We focus here on sanitary and phytosanitary (SPS) measures and technical barriers to trade (TBT), which are the most important technical measures that might affect trade. SPS measures refer to regulations related to food safety and animal and plant health. TBT measures include technical regulations, standards, and conformity assessment procedures.

Figure 4.23 compares the ad valorem equivalent (AVE)<sup>14</sup> of SPS measures in African and non-African countries. In Africa, Ghana is one of the top producers and exporters of cocoa and has the highest AVE of SPS measures, followed by Mali and Zimbabwe. In the case of non-African countries, Colombia imposes the most restrictive SPS measures. In addition to its high and escalating tariffs, China also has stringent SPS measures resulting in a high AVE on cocoa imports. In Europe, France, Germany, the United Kingdom, and Greece are among the countries with the highest AVE of SPS measures imposed on cocoa imports from Africa. For tea and coffee, Cabo Verde, Mali, and Gambia have the highest AVE of SPS measures on imports. In non-African markets, the highest AVEs are in European countries.

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<sup>14</sup> Ad valorem equivalents measure the impact of nontariff trade restrictions by estimating an economically equivalent tariff rate. AVEs will be negative in cases where SPS and TBT measures facilitate trade.

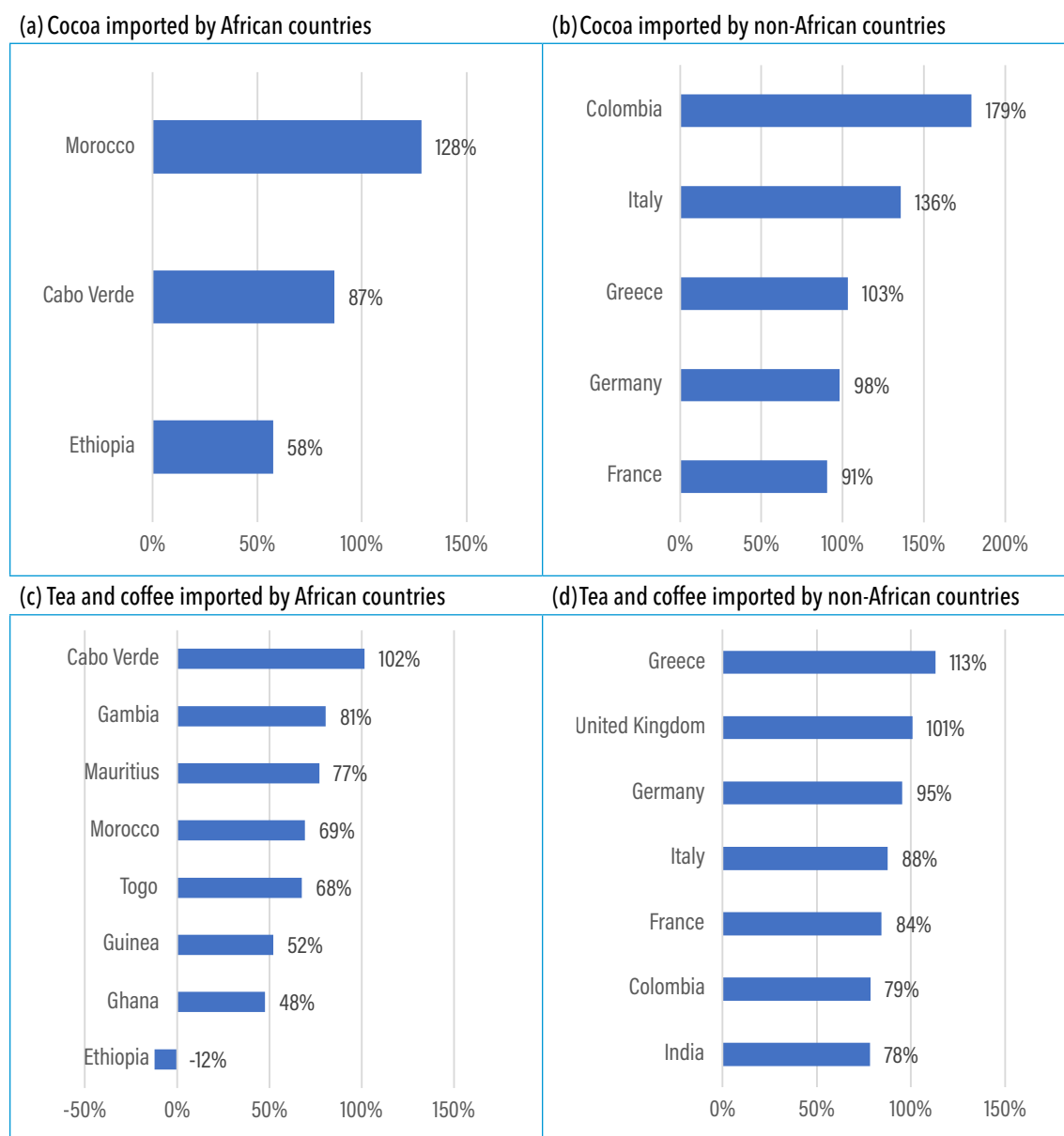
Figure 4.23 AVE of SPS measures in African and non-African countries, 2018



**Source:** Authors' elaboration based on Nguyen, Bouët, and Traoré (2020).

As for TBT, Figure 4.24 shows that the highest AVEs of TBT measures in cocoa are in Morocco, Cabo Verde, and Ethiopia. Among non-African countries, Colombia and the European countries are the most restrictive. In the case of tea and coffee, Cabo Verde, Gambia, and Mauritius are among the most restrictive countries. Among non-African economies, European countries, India, and Colombia impose the most restrictive TBT measures.

Figure 4.24 AVE of TBT in African and non-African countries, 2018



Source: Authors' elaboration based on Nguyen, Bouët, and Traoré (2020).

### Domestic factors

Domestic demand for cocoa, coffee, and tea could play an important role in increasing intra-African trade and in fostering African exports. A large African market could foster domestic competitiveness as firms benefit from economies of scale, and increased competitiveness at the regional level could increase African products' competitiveness at the international level over time. Thus, domestic producers could benefit from the liberalization of the African market under the AfCFTA to "learn" and realize productivity gains that gradually allow them to compete internationally.

Nevertheless, market liberalization and harmonization of trade-related regulations at the African level are unlikely to promote significant shifts in countries' competitiveness if trade policy is not consistent with industrial policy (UNCTAD 2019). Most importantly, a poor business

climate will continue to undermine Africa's potential to increase production and exports of processed products. In the sections below, we focus on several internal challenges that reduce the attractiveness of African markets to domestic and foreign investments, which will need to be addressed to increase competitiveness.

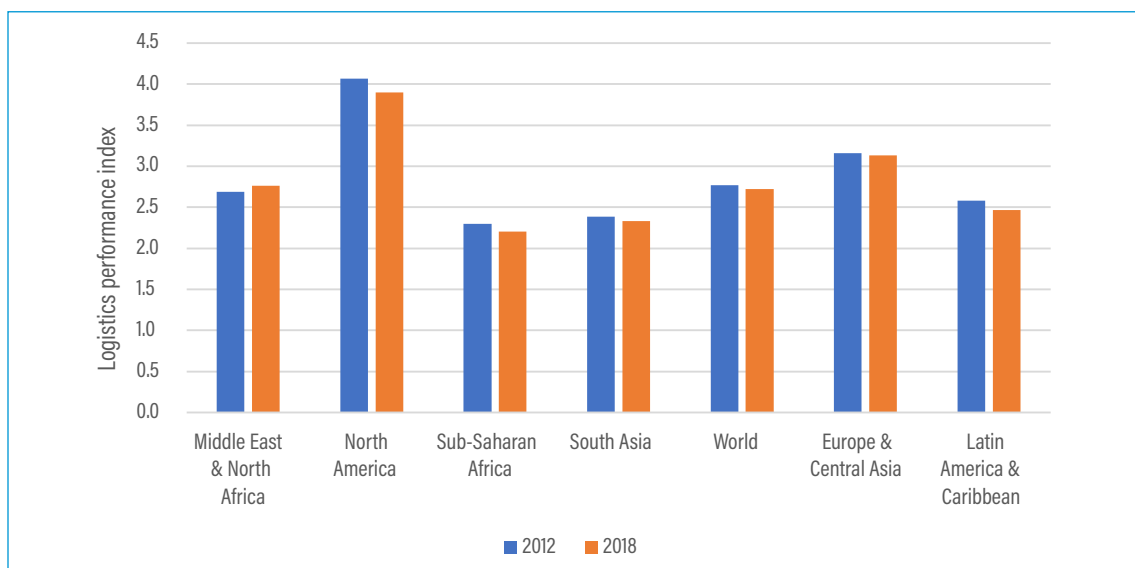
### Underdeveloped infrastructure

Figure 4.25 depicts the logistics performance index for several regions. This index quantifies the quality of trade- and transport-related infrastructure, with a lower index value indicating poor quality of trade-related infrastructure (for example, ports, railroads, road, and information technology) and vice versa. North America has by far the highest score at the global level, followed by Europe and Central Asia. Sub-Saharan Africa has the lowest score in both years (2012 and 2018), with an index value of 2.3 in 2012, dropping to 2.2 in 2018.

The low quality of trade infrastructure in Africa can be traced back to colonial times when colonizers focused on developing infrastructure that served the export-oriented economies. Only roads connecting to ports were developed, while other traditional continental trade routes were ignored and deteriorated over time.

Underdeveloped regional roads are a fundamental problem for intra-African trade. At the country level, the absence of adequate transport and storage services and weak information and technology (IT) infrastructure are all major problems facing production and trade of tropical crops like cocoa, coffee, and tea. Value chains for fresh produce require swift and appropriate transport and storage to avoid damage. Poor infrastructure and hot and humid weather conditions contribute to significant commodity spoilage. Together, stringent SPS and TBT measures, underdeveloped infrastructure, and poor logistics act as barriers facing African industries wishing to compete internationally. There are also significant disparities between small-scale farmers and multinationals in access to and use of technology and efficient management practices. This affects competitiveness of small-scale farmers and small and medium enterprises (SMEs) and is one of the major barriers to their engagement in international trade.

Figure 4.25 Quality of trade and transport-related infrastructure



**Source:** Logistics performance index, <https://lpi.worldbank.org/>.

**Note:** Logistics professionals' perception of a country's quality of trade- and transport-related infrastructure (e.g., ports, railroads, roads, information technology), on a scale ranging from 1 (very low) to 5 (very high). Scores are averaged across all respondents.

## Institutional barriers

Colonialism also left African countries with diverse legal infrastructure and institutions. Official languages, laws, business practices, and overall economic traditions differ across the continent, which hinders trade integration (Bjornlund et al. 2020). In addition, high transaction costs from poorly functioning legal and judicial systems, slow and costly export and import procedures, and lack of access to finance all compound the institutional challenges that African producers face every day. For small-scale farmers, access to credit is a major obstacle. In the absence of contract enforcement in the ownership of land, many small firms and small-scale farmers lack the collateral needed to access credit. For firms (especially SMEs), access to credit is necessary to invest in processing technology and equipment. In the special case of cocoa, for example, where the value chain is complex and processing activities are capital intensive, access to credit is essential for domestic firms to engage successfully in downstream activities.

## CONCLUSION

In this chapter, we have analyzed African participation in global value chains for coffee, cocoa, and tea. We have examined African trade in the three products by level of processing and export destination and have estimated over-trading and under-trading by African countries compared with their potential. We also discussed possible causes of under-trading and low participation in downstream processing.

Our findings suggest that a significant proportion of African exports of cocoa, coffee, and tea involve little or no processing. Exports of the three commodities are concentrated in unprocessed coffee and cocoa and semi-processed tea. Our gravity estimations suggest that many African countries are under-trading cocoa, coffee, and tea across the three levels of processing and that there is strong potential not only to trade more in volume but also to trade “better” in terms of more sophisticated products.

Several factors explain both under-trading and the concentration of exports in unprocessed commodities. The first relates to the structure of these value chains at the global and regional levels. At the global level, cocoa and coffee processing, for example, are characterized by chain fragmentation due to concentration of downstream activities among a few large multinational firms in consumer markets. In some cases, as for coffee, technical aspects and cost-efficiency considerations mean that processing is better done near the consumer. The predominance of ex-colonial powers as major trade partners and their use of escalating tariffs contribute to the stagnation of trade relations. African exports of semi-processed and processed products also face difficulty accessing EU and US markets because of stringent SPS measures. While some of these measures are justified based on health and safety concerns, others are highly protective and have a negative impact on African exports. To resolve this impasse, more transparency is needed from the EU and US trade rules and better-quality products are needed from the African side.

Arguably, compliance with EU standards may generate benefits that extend beyond better access to EU markets, as compliance could facilitate access to other markets with similar standards. Moreover, an increasing proportion of consumers in developing countries are demanding organic, sustainable, and ethical products; meeting the standards needed for this growing market could provide an opportunity for Africa to increase its global market share (Woolfrey and Karkare 2021). However, the more transparent the rules are, the easier it will be for African countries to comply and thus increase exports.

At the regional level, the lack of trade-related regulatory convergence leads to fragmented and underdeveloped value chains. Notably, intra-African tariffs are often higher than the preferen-

tial tariffs imposed on African exports by wealthier regions (under the GSP or the EBA Initiative, for example). Thus, despite the availability of high-quality African-grown cocoa, coffee, and tea, many African countries continue to source a substantial share of these inputs from outside the continent for purposes of processing and manufacturing of final goods.

Yet, intra-African trade offers another opportunity to develop regional value chains through forward integration and upgrading of products to serve the growing regional market. Processing agricultural crops like cocoa, coffee, and tea would reduce the concentration of exports in primary commodities and reduce African countries' vulnerability to global price shocks (UNCTAD 2019). Consumption of cocoa, coffee, and tea is relatively low in the region but is increasing with rising income levels. However, promotion of intra-African trade will require serious tariff dismantlement and elimination of burdensome nontariff measures. Poor trade-related infrastructure and high transport costs also would need to be addressed (Bouët and Odjo 2019).

In this context, the full implementation of the AfCFTA can contribute to development of regional value chains, allowing African countries to benefit from trade complementarities and economies of scale as they access a larger (free) market (UNCTAD 2019). With greater regional trade, African firms – especially SMEs – can “learn” to process and upgrade their products. They can benefit from regional integration and investments to build capacity and share know-how before competing in international markets. Finally, internal challenges, especially those related to access to technology and credit must be addressed, as these are two key determinants of the success of African countries in upgrading along regional and global value chains.

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## APPENDIX

Table A4.1 Classification of coffee, tea, and cocoa by level of processing (HS6 level)

HS6	Product	Stage	Description
90111	Coffee	Unprocessed	Coffee; not roasted or decaffeinated
90112	Coffee	Unprocessed	Coffee; decaffeinated, not roasted
90121	Coffee	Semi-processed	Coffee; roasted, not decaffeinated
90122	Coffee	Semi-processed	Coffee; roasted, decaffeinated
90190	Coffee	Semi-processed	Coffee; husks and skins, coffee substitutes containing coffee in any proportion
210111	Coffee	Processed	Extracts, essences, and concentrates of coffee; and preparations with a basis of these extracts, essences, or concentrates or with a basis of coffee
210112	Coffee	Processed	Preparations with a basis of extracts, essences, or concentrates or with a basis of coffee
210120	Coffee	Processed	Extracts, essences, and concentrates of tea or maté; and preparations with a basis of these extracts, essences, or concentrates or with a basis of tea or maté
210130	Coffee	Processed	Chicory, roasted and other roasted coffee substitutes; extracts, essences and concentrates thereof
90210	Tea	Unprocessed	Tea, green; (not fermented), in immediate packings of a content not exceeding 3 kg
90220	Tea	Unprocessed	Tea, green; (not fermented), in immediate packings of a content exceeding 3 kg
90230	Tea	Semi-processed	Tea, black; (fermented) and partly fermented tea, in immediate packings of a content not exceeding 3 kg
90240	Tea	Semi-processed	Tea, black; (fermented) and partly fermented tea, in immediate packings of a content exceeding 3 kg
90300	Tea	Processed	Maté
180100	Cocoa	Unprocessed	Cocoa beans; whole or broken, raw or roasted
180200	Cocoa	Unprocessed	Cocoa; shells, husks, skins and other cocoa waste
180310	Cocoa	Semi-processed	Cocoa; paste, not defatted
180320	Cocoa	Semi-processed	Cocoa; paste, wholly or partly defatted
180400	Cocoa	Semi-processed	Cocoa; butter, fat, and oil
180500	Cocoa	Semi-processed	Cocoa; powder, not containing added sugar or other sweetening matter
180610	Cocoa	Semi-processed	Cocoa; powder, containing added sugar or other sweetening matter
180620	Cocoa	Processed	Chocolate and other food preparations containing cocoa; in blocks, slabs, or bars weighing more than 2 kg or in liquid, paste, powder, granular or other bulk form in containers or immediate packings, content exceeding 2 kg
180631	Cocoa	Processed	Chocolate and other food preparations containing cocoa; in blocks, slabs, or bars, filled, weighing 2 kg or less
180632	Cocoa	Processed	Chocolate and other food preparations containing cocoa; in blocks, slabs, or bars, (not filled), weighing 2 kg or less
180690	Cocoa	Processed	Chocolate and other food preparations containing cocoa; n.e.c. in chapter 18

## Technical Discussion

The first step in assessing trade performance of an exporter for a product is to establish the trade potential, which provides a benchmark or scale to measure success. If the country exports less than its potential for a product, then it is under-trading. If it exports more than its potential, then it is over-trading.

Economists have developed robust models that determine predicted or expected trade based on a country's fundamentals. The workhorse model of international trade, called the gravity model, is used to measure trade potential. We employ this model to estimate the trade potential of African countries with different trading partners for cocoa, coffee, and tea. This analytical framework for international trade, proposed by Tinbergen (1962) and inspired by Newton's law of gravity, states that the volume of trade between two countries is proportional to their economic mass and a measure of their relative trade frictions. The present structure of the gravity model is built on this basic construct, with some theoretical reconstructions to lend better predictive abilities to the model described below.

We assess the trade potential, that is expected or potential trade, at each level of processing. On the importer side, we look at country groups including European countries, rich OECD countries, and countries in the African continent. As the estimate of trade potential is based on a model, having the correct model is of paramount importance. A reliable estimate of trade potential provides an essential benchmark for measuring a country's actual trade performance.

### Measuring trade barriers in a multilateral way

Bilateral trade depends not only on bilateral trade barriers but also on average trade barriers across all trade partners, termed multilateral resistance. The identification and explanation of multilateral resistance helps estimate one nation's costs of overseas trade when estimating a gravity model. Multilateral resistance matters for both countries in a trading pair (exporter and importer) and can vary over time. For example, multilateral resistance explains the substantial trade between Australia and New Zealand – not only are these two countries close to each other but they are also far away from the rest of the world. A properly specified model that accounts for time varying multilateral resistance gives a truer prediction of trade. Olivero and Yotov (2012) recommend the use of exporter x time and importer x time dummy variables to account for time varying multilateral resistance.

### Properly accounting for zero trade

The standard (logarithmic) gravity model ignores the prevalence of zeros in the bilateral trade flows. Trading relationships are replete with zeros, which a good model should be able to explain. Helpman, Melitz, and Rubinstein (2008) argue that the zeros in trade flows may be due to fixed costs of exporting, which cause firms to self-select into exporting. They highlight the importance of accounting for zero trade values due to selection bias in the gravity model. Only the more productive firms export since exporting is costly. When no firm that is productive finds it profitable to export, there is no trade. A properly specified gravity model should account for these differences based on firm characteristics.

### Use of nonlinear models

Given the inability of linear gravity models to efficiently account for zeros, the emphasis has moved to nonlinear estimators of the gravity models. Silva and Tenreyro (2006) propose an easy to implement strategy due to inconsistency of the linear gravity model. The inconsistency arises because the validity of the linearized model depends on the strong assumption that the error terms (unobserved factors) are statistically independent of the variables used in the estimation (homoscedasticity assumption). They propose a method (Poisson pseudo maximum likelihood estimation, or PPML) that not only provides consistent estimates in the presence of

violation of this assumption but also provide a natural way to deal with zero trade values. Hence, we employ the most recent developments in the panel data gravity model to gauge trading relative to the potential, considering time varying multilateral resistance (Olivero and Yotov 2012), zero trade (Helpman, Melitz, and Rubinstein 2008), and heteroscedasticity leading to inconsistent estimates (Silva and Tenreyro 2006).

The following PPML equation (1) is used to estimate the bilateral trade flows for cocoa, coffee, and tea, estimated separately for unprocessed, semi-processed and processed items. The gravity model that we estimate takes the following form

$$X_{ijt} = \exp(\beta_0 + \pi_{it} + \pi_{jt} + \alpha_h D_{iS} + \theta_g Z_{ij}) U_{ijt} \quad (1)$$

Where  $X_{ijt}$  denotes exports from country  $i$  to country  $j$  measured in current dollars at time  $t$ .  $\pi_{it}$  and  $\pi_{jt}$  are the time varying exporter and importer dummies to account for unobservable multilateral resistance and potentially any other observed and unobserved country-specific and time-varying characteristics: changes in national policies, quality of institutions and infrastructure, and accession of countries into arrangements such as the European Union (EU) and the WTO.  $Z_{ij}$  represents the country pair factors likely to affect trade.  $D_{iS}$  represents the category  $S$  to which country  $i$ 's trading partner belongs (Europe, OECD, or Africa). It thus represents the membership group of  $j$ . Different  $\alpha_h$  comprise the relevant coefficients to be estimated to assess under-trading (estimated  $< 0$ ) and over trading (estimated value  $> 0$ ).

Tables A4.3, A4.4, and A4.5 present the results of PPML estimation of the gravity model for processed, semi-processed, and unprocessed cocoa, coffee, and cocoa for the period 2003-2020.

Some small producers and inconsistent exporters tend not to under-export processed cocoa. Yet commonly, the comparatively large producers are under-exporting or are normal exporters based on the fundamentals, as coefficients in Table 3A indicate. Sierra Leone, a traditional cocoa producer, tends to export above normal given the fundamentals, despite being a small exporter overall.

**Table A4.2 Country names and acronyms**

AGO	Angola
BDI	Burundi
BEN	Benin
BFA	Burkina Faso
BWA	Botswana
CAF	Central African Republic
CIV	Côte d'Ivoire
CMR	Cameroon
COD	Congo, Dem. Rep.
COG	Congo, Rep.
COM	Comoros
CPV	Cabo Verde
DJI	Djibouti
DZA	Algeria
EGY	Egypt, Arab Rep.
ERI	Eritrea
ETH	Ethiopia (excludes Eritrea)

GAB	Gabon
GHA	Ghana
GIN	Guinea
GMB	Gambia
GNB	Guinea-Bissau
KEN	Kenya
LBR	Liberia
LBY	Libya
LSO	Lesotho
MAR	Morocco
MDG	Madagascar
MLI	Mali
MOZ	Mozambique
MRT	Mauritania
MUS	Mauritius
MWI	Malawi
NAM	Namibia
NER	Niger
NGA	Nigeria
RWA	Rwanda
SDN	Sudan
SEN	Senegal
SLE	Sierra Leone
SWZ	Eswatini
SYC	Seychelles
TCD	Chad
TGO	Togo
TUN	Tunisia
TZA	Tanzania, United Rep.
UGA	Uganda
ZAF	South Africa
ZMB	Zambia
ZWE	Zimbabwe

Table A4.3 PPML gravity model estimates for level of trading, 2003–2020: Cocoa

Commodity- Processed cocoa Importer - OECD countries	Coefficient Standard error	Commodity- Processed cocoa Importer - Europe	Coefficient Standard error	Commodity- Processed cocoa Importer - Africa	Coefficient Standard error
BWA - OEC	-3.212 (2.05)*	CMR - EUR	-3.423 (2.64)**	BWA - AFR	3.201 (2.06)*
CAF - OEC	-10.875 (10.76)**	CIV - EUR	2.606 (2.76)**	CIV - AFR	-6.407 (5.72)**
CMR - OEC	-3.931 (3.62)**	COG - EUR	2.790 (2.54)*	COG - AFR	-4.516 (3.70)**
CIV - OEC	5.183 (5.08)**	EGY - EUR	-4.659 (3.77)**	GIN - AFR	-3.967 (2.40)*
COG - OEC	3.501 (3.07)**	GHA - EUR	1.825 (2.00)*	GMB - AFR	9.166 (9.60)**
EGY - OEC	-2.885 (2.79)**	KEN - EUR	2.971 (1.98)*	MAR - AFR	2.886 (2.31)*
MAR - OEC	-3.987 (4.09)**	MAR - EUR	-2.370 (2.46)*	MDG - AFR	-3.872 (2.66)**
MDG-OEC	4.149 (3.07)**	SLE - EUR	5.038 (3.93)**	RWA - AFR	-5.008 (3.15)**
SEN - OEC	-2.769 (3.17)**	SWZ - EUR	-4.980 (3.12)**	SEN - AFR	2.610 (2.77)**
SEN - OEC	-2.769 (3.17)**	SWZ - EUR	-4.980 (3.12)**	SEN - AFR	2.610 (2.77)**
SLE - OEC	5.342 (4.25)**	TUN - EUR	-3.195 (3.31)**	SLE - AFR	-5.609 (3.85)**
SWZ - OEC	-2.987 (2.43)*	ZWE - EUR	-4.673 (3.00)**	TUN - AFR	2.831 (2.37)*
TUN - OEC	-4.252 (4.61)**	log distance	-1.488 (9.03)**	UGA - AFR	-3.112 (2.32)*
ZMB - OEC	-3.506 (2.16)*	Constant	11.353 (7.86)**	log distance	-1.730 (8.31)**
Log distance	-1.595 (11.87)**	N	51,623	Constant	13.980 (8.80)**
Constant	11.188 (9.54)**			N	51,652
N	51,384				

Commodity- Semi-processed cocoa Importer - OECD	Coefficient Standard error	Commodity- Semi-processed cocoa Importer - Europe	Coefficient Standard error	Commodity- Semi-processed cocoa Importer - Africa	Coefficient Standard error
CMR - OEC	4.508 (4.33)**	CMR - EUR	2.557 (2.19)*		
CIV - OEC	2.795 (3.46)**	DZA - EUR	3.422 (2.85)**		
COG - OEC	8.613 (6.95)**	EGY - EUR	-4.131 (3.28)**		
DZA - OEC	4.549 (4.18)**	NGA - EUR	2.542 (2.70)**		
EGY - OEC	-3.499 (3.67)**	SEN - EUR	2.282 (2.00)*		
ETH - OEC <sup>15</sup>	6.643 (5.09)**	UGA - EUR	2.351 (2.15)*		
GHA - OEC	2.348 (2.87)**	Log distance	-0.263 (0.29)		
MDG - OEC	3.942 (3.30)**	Constant	3.985 (0.51)		
NGA - OEC	2.016 (2.34)*	<i>N</i>	43,665		
SWZ - OEC	-5.267 (3.39)**				
UGA - OEC	3.062 (2.89)**				
Log distance	-0.177 (0.40)				
Constant	1.647 (0.43)				
<i>N</i>	43,430				

<sup>15</sup> Ethiopia has a very low level of processed cocoa exports (on average less than US\$5,000) and is an importer of cocoa beans. With no domestic production, a fundamental factor, very little exports show up as above potential.

Commodity- Unprocessed cocoa Importer - OECD/Europe	Coefficient Standard error	Commodity- Unprocessed cocoa Importer - Africa	Coefficient Standard error
CAF - EUR	-2.412 (2.39)*	BDI - AFR	4.334 (2.73)**
CMR - EUR	-2.047 (2.47)*	BWA - AFR	13.466 (9.98)**
COG - EUR	1.649 (1.98)*	CAF - AFR	5.099 (5.02)**
EGY - EUR	-3.317 (2.55)*	DJI - AFR	13.963 (10.40)**
ETH - EUR	3.861 (3.09)**	DZA - AFR	4.509 (3.19)**
MWI - EUR	5.082 (3.59)**	EGY - AFR	5.556 (3.74)**
NGA - EUR	-1.324 (2.07)*	GMB - AFR	20.159 (18.89)**
SEN - EUR	-3.019 (2.79)**	MDG - AFR	2.342 (2.28)*
ZAF - EUR	-4.157 (3.04)**	MUS - AFR	5.251 (3.28)**
Log distance	0.167 (0.16)	NGA - AFR	1.924 (2.81)**
Constant	3.075 (0.34)	SLE - AFR	-5.923 (4.69)**
N	24,084	SWZ - AFR	14.859 (11.04)**
		TZA - AFR	3.014 (2.81)**
		ZAF - AFR	3.126 (2.51)*
		ZMB - AFR	9.008 (5.92)**
		ZWE - AFR	13.406 (11.19)**
		Log distance	0.041 (0.04)
		Constant	3.739 (0.46)
		N	23,929

**Note:** \*  $p < 0.05$ ; \*\*  $p < 0.01$ . PPML = Poisson pseudo maximum likelihood estimate. All regressions include exporter x time, importer x time fixed effects and pair fixed effects. In semi-processed cocoa for African importers, all trading pairs show normal trading. For unprocessed cocoa, OECD and Europe as importer show similar results, only OECD countries as importer presented.

Table A4.4 PPML gravity model estimates for level of trading, 2003–2020: Coffee

Commodity- Processed coffee Importer - OECD countries/Europe	Coefficient Standard error		Commodity- Processed coffee Importer - Africa	Coefficient Standard error
CIV - EUR	-6.242 (6.83)**		BWA - AFR	8.841 (6.96)**
ETH - EUR	-6.376 (4.45)**		COG - AFR	3.881 (2.27)*
GHA - EUR	-4.667 (4.60)**		DJI - AFR	-3.697 (2.29)*
MAR - EUR	-4.098 (4.04)**		EGY - AFR	-3.397 (2.13)*
MDG - EUR	3.989 (2.78)**		ETH - AFR	-5.732 (4.30)**
ZAF - EUR	-3.670 (3.86)**		GHA - AFR	2.968 (2.63)**
Log distance	-1.288 (4.69)**		MWI - AFR	-3.596 (2.81)**
Constant	10.162 (4.92)**		RWA - AFR	-3.447 (2.64)**
N	37,213		SLE - AFR	-5.081 (3.52)**
			SWZ - AFR	-3.410 (2.55)*
			ZWE - AFR	5.922 (3.87)**
			log distance	-1.379 (6.05)**
			Constant	10.868 (6.20)**
			N	37,197

Commodity- Semi-processed coffee Importer - OECD		Commodity- Semi- processed coffee Importer - Europe		Commodity- Semi- processed coffee Importer - Africa	Coefficient Standard error
BDI - OEC	-1.879 (2.29)*	BDI - EUR	-2.135 (2.75)**	BDI - AFR	2.459 (2.94)**
COG - OEC	4.927 (3.98)**	CAF - EUR	5.001 (4.43)**	BWA - AFR	11.384 (9.31)**
DZA - OEC	-2.164 (2.02)*	COG - EUR	6.231 (6.09)**	COG - AFR	-4.045 (3.10)**
EGY - OEC	-1.785 (2.15)*	EGY - EUR	-2.580 (2.78)**	DJI - AFR	-4.872 (2.84)**
GHA - OEC	-1.813 (2.35)*	GMB - EUR	-1.645 (2.04)*	ETH - AFR	-2.487 (3.59)**
GMB - OEC	-2.539 (3.13)**	KEN - EUR	-1.680 (2.61)**	GHA - AFR	1.848 (2.46)*
KEN - OEC	1.656 (1.97)*	MAR - EUR	-4.378 (4.57)**	GMB - AFR	2.525 (2.89)**
MAR - OEC	-5.182 (6.02)**	NGA - EUR	-3.843 (2.99)**	KEN - AFR	-2.325 (2.38)*
NER - OEC	-6.508 (4.93)**	RWA - EUR	-1.625 (2.15)*	LBR - AFR	11.962 (9.86)**
SLE - OEC	3.619 (2.95)**	TGO - EUR	3.422 (2.25)*	MAR - AFR	3.936 (4.18)**
ZAF - OEC	-1.733 (2.26)*	log distance	-1.820 (11.78)**	NGA - AFR	-3.320 (2.34)*
Log distance	-1.813 (12.31)**	Constant	15.680 (11.88)**	SLE - AFR	-3.768 (3.00)**
Constant	15.314 (10.55)**	<i>N</i>	44,512	ZAF - AFR	2.279 (2.99)**
<i>N</i>	43,157			log distance	-1.651 (12.13)**
				Constant	13.883 (12.69)**
				<i>N</i>	44,673

Commodity- Unprocessed coffee Importer - OECD	Coefficient Standard error	Commodity- Unprocessed coffee Importer - Europe	Coefficient Standard error	Commodity- Unprocessed coffee Importer - Africa	Coefficient Standard error
BDI - OEC	2.057 (2.35)*	AGO - EUR	4.540 (3.49)**		
COG - OEC	2.585 (2.16)*	BDI - EUR	1.770 (2.32)*		
ETH - OEC	2.048 (2.53)*	CMR - EUR	1.986 (2.57)*		
KEN - OEC	3.400 (3.80)**	COG - EUR	2.549 (2.90)**		
MAR - OEC	3.088 (1.97)*	ETH - EUR	1.430 (2.00)*		
MOZ - OEC	4.012 (3.01)**	LBR - EUR	2.503 (2.66)**		
MUS - OEC	9.609 (3.38)**	MWI - EUR	1.613 (2.07)*		
MWI - OEC	2.261 (2.21)*	UGA - EUR	2.007 (2.76)**		
SEN - OEC	-2.555 (2.46)*	ZWE - EUR	2.170 (2.55)*		
SWZ - OEC	8.956 (3.27)**	Log distance	-2.942 (4.75)**		
TZA - OEC	2.548 (2.80)**	Constant	26.878 (4.94)**		
ZMB - OEC	2.252 (2.31)*	N	62,021		
ZWE - OEC	3.707 (2.46)*				
Log distance	-3.095 (6.53)**				
Constant	27.466 (6.47)**				
N	61,646				

**Note:** \*  $p < 0.05$ ; \*\*  $p < 0.01$ . PPML = Poisson pseudo maximum likelihood estimate. All regressions include exporter x time, importer x time fixed effects and pair fixed effects. Unprocessed coffee all Africa and trading group pair shows normal trading (not presented).

Table A4.5 PPML gravity model estimates for level of trading, 2003–2020: Tea

Commodity- Processed tea Importer - OECD countries	Coefficient Standard error	Commodity- Processed tea Importer - Europe	Coefficient Standard error	Commodity- Processed tea Importer - Africa	Coefficient Standard error
CAF - OEC	8.487 (4.90)**	EGY - EUR	-4.283 (2.98)**		
CMR - OEC	10.024 (5.92)**	GHA - EUR	-3.491 (2.14)*		
DZA - OEC	10.164 (5.56)**	TZA - EUR	-4.298 (2.80)**		
SEN - OEC	-3.357 (1.96)*	ZWE - EUR	-5.359 (3.29)**		
ZWE - OEC	-6.101 (3.22)**	log distance	-1.996 (3.53)**		
Log distance	-1.491 (3.71)**	Constant	18.981 (3.70)**		
Constant	13.126 (3.45)**	N	12,875		
N	12,812				
Commodity- Semi-processed tea Importer - OECD	Coefficient Standard error	Commodity- Semi- processed tea Importer - Europe	Coefficient Standard error	Commodity- Semi- processed tea Importer - Africa	Coefficient Standard error
CAF - OEC	10.226 (8.00)**	CIV - EUR	-5.441 (2.99)**	BWA - AFR	2.890 (2.17)*
CIV - OEC	-4.045 (2.77)**	DJI - EUR	4.130 (3.61)**	CIV - AFR	4.509 (3.23)**
DJI - OEC	2.452 (2.24)*	ETH - EUR	2.272 (2.11)*	COG - AFR	-3.175 (2.31)*
MAR - OEC	4.585 (3.43)**	KEN - EUR	2.847 (2.86)**	DJI - AFR	-2.968 (2.16)*
MOZ - OEC	3.109 (2.67)**	MAR - EUR	3.582 (2.18)*	EGY - AFR	-4.230 (2.13)*
MUS - OEC	5.067 (3.33)**	MOZ - EUR	3.549 (2.81)**	ETH - AFR	-2.858 (2.20)*
MWI - OEC	2.822 (2.92)**	MUS - EUR	5.785 (3.33)**	KEN - AFR	-2.918 (2.82)**
NGA - OEC	2.703 (2.39)*	MWI - EUR	3.425 (3.28)**	MAR - AFR	-5.958 (4.32)**
ZAF - OEC	2.571 (2.76)**	NER - EUR	0.020 (0.02)	MUS - AFR	-4.146 (2.87)**
ZWE - OEC	2.897 (2.93)**	NGA - EUR	3.136 (2.94)**	SLE - AFR	-3.247 (2.29)*
Log distance	-0.060 (0.11)	TUN - EUR	3.618 (2.09)*	Log distance	-0.468 (0.98)
Constant	2.979 (0.68)	TZA - EUR	3.091 (2.92)**	Constant	7.361 (1.81)

N	54,273	ZAF - EUR	3.676 (3.53)**	N	54,666
		ZWE - EUR	3.762 (3.44)**		
		Log distance	-0.145 (0.29)		
		Constant	3.635 (0.87)		
		N	54,915		
Commodity- Unprocessed tea Importer - OECD/ Europe	Coefficient Standard error	Commodity- Unprocessed tea Importer - Europe	Coefficient Standard error	Commodity- Unprocessed tea Importer - Africa	Coefficient Standard error
		DZA - EUR	-2.487 (2.24)*		
		MUS - EUR	3.211 (2.88)**		
		NER - EUR	-6.654 (5.22)**		
		SEN - EUR	-5.488 (5.67)**		
		UGA - EUR	-3.594 (3.24)**		
		TZA - EUR	-2.427 (2.03)*		
		Log distance	-1.500 (8.97)**		
		Constant	9.787 (7.20)**		
		N	37,584		

**Note:** \*  $p < 0.05$ ; \*\*  $p < 0.01$ . PPML = Poisson pseudo maximum likelihood estimate. All regressions include exporter x time, importer x time fixed effects and pair fixed effects