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# U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

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# Abbreviations and Acronyms

<b>Acronyms</b>	<b>Term</b>
3G	third generation (of mobile telecommunications technology)
4G	fourth generation (of mobile telecommunications technology)
5G	fifth generation (of mobile telecommunications technology)
ACA	Anti-Counterfeit Authority (Kenya)
ACRE	Agriculture and Climate Risk Enterprise (Kenyan firm)
AEC	African Economic Community
AfCFTA	African Continental Free Trade Area
AfDB	African Development Bank
AGOA	African Growth and Opportunity Act
AGRA	Alliance for a Green Revolution in Africa
AMU/UMA	Arab Maghreb Union
APDP	Automotive Production and Development Programme (South Africa)
ARIPO	African Regional Intellectual Property Organization
ATP	assembly, testing, and packaging
AU	African Union
AUC	African Union Commission
AUV	average unit value
AVE	ad valorem equivalent
AWS	Amazon Web Services
BEA	Bureau of Economic Analysis (USDOC)
BOP	balance of payments
CAGR	compound annual growth rate
CBN	Central Bank of Nigeria
CDN	content delivery network
CEMAC	Economic and Monetary Community of Central Africa
CEN-SAD	Community of Sahel-Saharan States
CET	common external tariff
CIPC	Companies and Intellectual Property Commission (South Africa)
CMOs	collective management organizations
COD	cash on delivery
COMESA	Common Market for Eastern and Southern Africa
CRS	Congressional Research Service
CSR	corporate social responsibility
DRC	Democratic Republic of the Congo
DTT	digital terrestrial television
EAC	East African Community
ECCAS	Economic Community of Central African States
ECE	Ethiopia Commodity Exchange
ECOWAS	Economic Community of West African States
EFT	Electronic funds transfer
EGDI	E-Government Development Index (United Nations)
EIPO	Ethiopian Intellectual Property Office
EPA	economic partnership agreement
EPO	European Patent Office
EPZ	export processing zone
EU	European Union
EV	electric vehicle
FAO	Food and Agriculture Organization of the United Nations

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

FDI	foreign direct investment
FREC	Ford Resource Engagement Centre (South Africa)
GDPR	General Data Protection Regulation
GE	General Electric Company
GI	geographic indicator
GMSA	General Motors South Africa
GPS	Global Positioning System
GSP	Generalized System of Preferences
GTA	Global Trade Atlas (IHS Markit platform)
GVC	global value chain
HS	Harmonized Commodity Description and Coding System (Harmonized System) (international codes for traded goods)
HTS	Harmonized Tariff Schedule of the United States
IaaS	infrastructure as a service
IAR	Institute for Agricultural Research (Nigeria)
ICT	information and communications technology
IFC	International Finance Corporation
IGAD	Intergovernmental Authority on Development (Africa)
IHG	InterContinental Hotels Group
ILO	International Labor Organization
IIPA	International Intellectual Property Alliance
INTA	International Trademark Association
IOC	international oil company
IP	intellectual property
IPASA	Innovative Pharmaceutical Association of South Africa
IPRs	intellectual property rights
IT	information technology
KECOBO	Kenya Copyright Board
KIPI	Kenya Industrial Property Institute
LBMA	London Bullion Market Association
LDCs	least-developed countries
LIB	lithium-ion battery
LME	London Metal Exchange
LNG	liquefied natural gas
LPG	liquefied petroleum gas
LPI	logistics performance index
M&As	mergers and acquisitions
Mbps	megabits per second
MHz	megahertz
MinT	Ministry of Innovation and Technology (Ethiopia)
MNEs	multinational enterprises
MVA	manufacturing value added
NAIDP	Nigerian Automotive Investment Development Plan
NBMA	National Biosafety Management Agency (Nigeria)
NBS	National Bureau of Statistics (Nigeria)
NFVCB	National Film and Video Censors Board (Nigeria)
NGLs	natural gas liquids
NGO	nongovernmental organization
NHI	National Health Insurance (South Africa)
NCC	Nigerian Copyright Commission
NNPC	Nigerian National Petroleum Company
NOC	national oil company

NTM	nontariff measure
NTR	normal trade relations
OAPI	Organisation Africaine de la Propriété Intellectuelle [African Intellectual Property Organization]
OCTG	oil country tubular goods
OECD	Organisation for Economic Co-operation and Development
OEM	original equipment manufacturer
OPEC	Organization of the Petroleum Exporting Countries
OS	operating system
OTT	over-the-top (media service)
PAIPO	Pan African Intellectual Property Organization
PBR	plant breeders' rights
PET	polyethylene terephthalate
PETG	polyethylene terephthalate glycol
PGMs	platinum-group metals
PIB	Petroleum Industry Bill (Nigeria)
REC	Regional Economic Community
SA	South Africa
SaaS	software as a service
SAB	South African Breweries
SACU	Southern African Customs Union
SADC	Southern African Development Community
SHG	special high grade
SMEs	small and medium-sized enterprises
SPS	sanitary and phytosanitary
SSA	sub-Saharan Africa
SSDs	solid-state storage devices
SSE	substantive search and examination (patent registration system)
STCs	specific trade concerns
SVOD	subscription video on demand
TBTs	technical barriers to trade
TFTA	Tripartite Free Trade Area
TISC	Technology and Innovation Support Centers (WIPO)
TK	traditional knowledge (WIPO)
TRIPS Agreement	Agreement on Trade-Related Aspects of Intellectual Property Rights (WTO)
TRQs	tariff-rate quotas
UNECA	United Nations Economic Commission for Africa
UNWTO	United Nations World Tourism Organization
USAID	U.S. Agency for International Development
USDOC	U.S. Department of Commerce
USITC	U.S. International Trade Commission
USPTO	U.S. Patent and Trademark Office
USTR	U.S. Trade Representative
VCD	video compact disc
VOD	video on demand
WAEMU	West African Economic and Monetary Union
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization



# Executive Summary

This report provides information on U.S. trade and investment with sub-Saharan Africa (SSA). In particular, it analyzes the sectors in which U.S. trade in goods and services with SSA showed the strongest growth during 2016–18; identifies SSA countries for which U.S. exports, imports, and outward foreign direct investment (FDI) increased the most during the period; and highlights the main factors behind this growth. Focusing on several SSA countries, including South Africa, Nigeria, Kenya, Ghana, Rwanda, Ethiopia, and Côte d’Ivoire (called “key markets” in this report), the Commission used case studies to provide in-depth analysis of trends in four important areas: (1) the ways U.S. products and services integrate into key SSA value chains; (2) the intellectual property environment in the key SSA markets, and the effects of that environment on trade and investment; (3) technological innovations in SSA agricultural production and exports; and (4) the digital economy in SSA. In examining SSA’s digital economy, the report explores how the adoption of digital technologies affects other industries and how policies and market conditions affect digital trade.

Further, this report summarizes recent developments in regional integration efforts in SSA, particularly the negotiation and implementation of the African Continental Free Trade Area. It also includes a summary of SSA countries’ utilization of preferential trade provisions under the African Growth and Opportunity Act (AGOA) and an account of the strategies many SSA countries have adopted to take fuller advantage of these provisions.

The report was prepared by the U.S. International Trade Commission (Commission or USITC) at the request of the U.S. Trade Representative (USTR) in a letter received by the Commission on May 6, 2019.

## Highlights

**The sectors in which U.S. exports of goods to SSA experienced the most growth in absolute value terms between 2016 and 2018 were petroleum products; aircraft, spacecraft, and related equipment; certain motor vehicle parts; motor vehicles; natural gas and components; and poultry.** Growth in these and other U.S. exports to SSA reflected increasing demand for these products owing to rising incomes in the region, growth in U.S. production, and improvements in SSA transport and other SSA infrastructure. The increase in value of U.S. exports to SSA also reflects increased petroleum prices. U.S. exports in services sectors such as finance, air transportation, professional and management consulting, and travel also grew steadily during this period. The most recent 2019 data on U.S. goods exports and imports with SSA can be found in appendix J.

**The sectors in which U.S. imports of goods from SSA between 2016 and 2018 grew the fastest in absolute value terms were crude petroleum; precious metals and non-numismatic coins; natural and synthetic gemstones; spices; ferroalloys; and certain ores, concentrates, ashes, and residues.** The growth in these and other U.S. imports from SSA mainly stemmed from higher FDI in SSA in some sectors, growth in consumer demand from the United States, expanded SSA production capabilities, and SSA cost advantages in production. The increase in value of U.S. imports also reflects increased petroleum prices.

**The United States' FDI stock in SSA increased slightly from 2016 to 2018. Mining (including crude petroleum) was the largest destination sector.** In 2018, the top three destinations in SSA for U.S. FDI stock were Mauritius, South Africa, and Nigeria. Two services sectors—business services and software/information technology (IT) services—attracted the largest numbers of new U.S. FDI projects in SSA.

**Value Chains.** SSA plays a relatively small role in global value chains (GVCs) and lags behind other major regional blocks in GVC participation. Mining (including petroleum and natural gas extraction), transportation equipment (including motor vehicles), and agriculture and agribusiness are among the key value chains in SSA that present opportunities for deepening U.S. firms' integration. SSA's value chains are more integrated with Europe than with the United States. South Africa is the hub for regional value chains in SSA. Macroeconomic and policy factors—such as domestic market size, income level, infrastructure and logistics performance, regional trade agreements and regional integration—influence trade, FDI, and the degree and type of global value chain (GVC) participation, as well as the associated economic benefits.

**Intellectual property rights (IPRs).** All SSA key markets, except Ethiopia, are parties to the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights, which requires minimum levels of IPR protections for all WTO signatories. Industry and government sources agree that weak capacity for both implementation and enforcement is a primary barrier to stronger IPR protections in SSA countries. IPR infringement varies widely among all countries (including among SSA countries), and is generally higher in SSA as a whole than in more developed markets. This likely hinders domestic and foreign investment, particularly in industries which rely on copyright and trademark protections.

**Agricultural innovation.** Agricultural innovations in SSA raise agricultural production and export potential by improving the competitiveness of agricultural products. Competitiveness is improved by reducing costs, differentiating products, and improving the reliability of supply. However, adoption of more advanced agricultural innovations in SSA is still low on average, and many hurdles exist to raising adoption rates, such as the large number of smallholders and the resulting fragmented production practices in most SSA countries. Adoption rates also vary widely from country to country in SSA. Differences among SSA countries that affect the adoption of new agricultural technologies include governmental regulations and policies, farm economy characteristics, and specific agronomic conditions.

**The digital economy.** The market for digital technologies in key SSA markets has grown in recent years, driven by increases in mobile phone penetration, the expansion of high-speed internet, and growth in consumer spending power. U.S. firms have made inroads into SSA markets, selling products or services directly to consumers as well as providing infrastructure or investment for the SSA digital economy. Adoption of digital technologies is also changing traditional services and manufacturing sectors by making firms more productive, thereby improving cost competitiveness, and by creating new distribution channels for products and services. However, government policies such as those that restrict access to licenses and the cross-border transfer of data can hinder trade and investment in the digital economy.

**Fuller use of AGOA benefits.** As of November 2019, 16 of 39 AGOA beneficiary countries have prepared national AGOA utilization strategies. These strategies identify sectors with the potential to increase exports to the United States under AGOA and propose ways to improve AGOA utilization. Many of these countries are also part of SSA's Regional Economic Communities (RECs), which are working to lessen

trade barriers that hamper AGOA utilization. Two of these RECs have developed AGOA strategies of their own, emphasizing intra-regional initiatives that can improve AGOA utilization.

**The African Continental Free Trade Area.** The African Union (AU) and the RECs continue to work toward the goal of a single, continent-wide market for Africa. Beginning in December 2015, negotiations for an agreement to establish an African Continental Free Trade Area began to gain momentum. The agreement entered into force on May 30, 2019. To date, 54 out of 55 AU members have signed the agreement, and 28 members have ratified it, though negotiations on details of the agreement are still ongoing. As of March 2020, the members of the free trade area still needed to negotiate many aspects of the agreement. This effort includes negotiating the details of the annexes of these first three protocols of Phase I, as well as pursuing the initial negotiations of the Phase II and Phase III protocols.

## Key Findings

### U.S. Exports of Goods and Services to SSA Countries during 2016–18

U.S. exports to SSA countries rose from \$13.5 billion in 2016 to \$15.9 billion in 2018, a compound annual growth rate (CAGR)<sup>1</sup> of 8.5 percent. Exports of petroleum products represented the largest portion of this increase, followed by exports of aircraft, spacecraft, and related equipment; certain motor vehicle parts; motor vehicles; natural gas and components; and poultry. SSA countries' increasing demand for petroleum-derived fuels, as well as a significant rise in the average price of crude petroleum from 2016 to 2018, drove much of the increase in exports of petroleum products and natural gas. While price increases contributed to the increase in the value of these exports, increasing demand also led to a rise in the volume of export of petroleum products and natural gas. Increased travel on SSA airlines has also driven demand for U.S. aircraft exports to SSA. At the same time, rising population and incomes have led to increasing demand for meat protein food sources, which has boosted U.S. exports of poultry to SSA.

The leading destination markets for U.S. exports of goods to SSA by absolute value growth were South Africa and Nigeria, while exports to Togo experienced the largest increase in percentage terms. U.S. exports of services to Africa as a whole also rose (although a breakout of the SSA region is not available); the services sectors in which U.S. exports grew fastest were professional and management consulting services, financial services, air transport services, and telecommunications services.

### Fastest-growing U.S. Exports of Goods to SSA

During 2016–18, a relatively small number of products accounted for most of the change in U.S. goods exports to SSA countries, in terms of absolute growth in the value of exports (table ES.1). The factors driving this growth are discussed in the sector profiles below.

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<sup>1</sup> Unless otherwise specified, growth is expressed in CAGR.

**Table ES.1** Fastest-growing U.S. exports of goods to SSA countries, 2016–18

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate
					2016–18
	Million \$				%
Petroleum products	688	1,032	1,355	667	40.3
Aircraft, spacecraft, and related equipment	1,764	1,497	2,181	417	11.2
Certain motor-vehicle parts	338	437	697	359	43.6
Motor vehicles	834	876	1,165	331	18.2
Natural gas and components	162	236	449	287	66.3
Poultry	282	433	465	182	28.3
All other	9,415	9,556	9,555	140	0.7
<b>Total</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>2,384</b>	<b>8.5</b>

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016. Digest codes used for each sector are listed in the relevant chapters of this report.

## Top SSA Growth Markets for U.S. Exports during 2016–18

The seven markets to which U.S. goods exports increased the most, in absolute value terms, were South Africa, Nigeria, Ethiopia, Togo, Tanzania, Zambia, and Senegal (table ES.2). The largest increase in percentage terms was in exports to Togo.

**Table ES.2** U.S. goods exports to SSA countries, by leading destination markets, 2016–18

Country	2016	2017	2018	Absolute change	Compound
				2016–18	annual growth rate
					2016–18
	Million \$				%
South Africa	4,600	5,051	5,517	917	9.5
Nigeria	1,895	2,173	2,686	792	19.1
Ethiopia	826	877	1,308	482	25.8
Togo	229	456	642	413	67.1
Tanzania	158	145	332	174	45.0
Zambia	82	85	195	114	54.2
Senegal	184	208	289	105	25.3
All other SSA	5,510	5,070	4,897	-613	-5.7
<b>Total SSA</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>2,384</b>	<b>8.5</b>

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

## Factors Leading to Growth of U.S. Goods Exports to SSA during 2016–18

**Petroleum products:** U.S. exports of petroleum products to SSA increased by \$667 million (40.3 percent CAGR) to \$1.4 billion from 2016 to 2018 (table ES.1). Most of the growth came from a rise in the value of U.S. exports of motor gasoline to South Africa and Nigeria, as well as a rise in the volume of U.S. exports of both diesel and jet fuel to Togo (a major transit hub for imports to West Africa). South Africa accounted for the majority of the increase in U.S. exports of motor gasoline to SSA, likely reflecting both

rising petroleum product consumption and a modest downturn in output from the country's petroleum refineries. Similarly, rising U.S. exports of motor gasoline to Nigeria were likely supported by the country's large gasoline demand and limited refinery output, as well as Nigerian efforts to minimize fuel shortages during the Christmas holiday before the February 2019 general election.

**Aircraft, spacecraft, and related equipment:** U.S. exports of civilian aircraft, engines, and parts to SSA increased by \$417 million (11.2 percent CAGR) to \$2.2 billion from 2016 to 2018 (table ES.1). Exports during the period grew largely due to an increase in the size of airline fleets in order to meet growing passenger volumes. As of 2020, Ethiopian Airlines was the largest African airline carrier, based on seat capacity and new aircraft orders. One factor in its growth is that Addis Ababa is a major international transfer hub for the region, including for tourists.

**Motor vehicles and certain motor-vehicle parts:** U.S. exports of motor vehicles to SSA increased by \$331 million (18.2 percent CAGR) to \$1.2 billion from 2016 to 2018 (table ES.1), with most of the exports going to Nigeria. U.S. exports of motor-vehicle parts increased by \$359 million (43.6 percent CAGR) to \$697 million in 2018, with most of the exports going to South Africa. Nigeria introduced policies, including tariffs, in 2013 designed to encourage more production of vehicles domestically. This initially contributed to a drop in U.S. vehicle exports, but such exports rebounded in 2016–18 due to a rule which allows firms (including U.S. firms) that manufacture vehicles in Nigeria to import vehicles into Nigeria at reduced tariff rates. Higher demand for motor vehicle parts for use as intermediate inputs in the manufacturing process, particularly from a U.S.-headquartered vehicle manufacturer, is the likely cause of increased U.S. exports of motor vehicle parts to South Africa.

**Natural gas and components:** U.S. exports of natural gas and components to SSA rose by \$287 million (66.3 percent CAGR) to \$449 million from 2016 to 2018 (table ES.1), with most of the exports going to Togo in the form of liquid petroleum natural gas (LPG). Improved LPG infrastructure in SSA, as well as increased urbanization and government programs promoting LPG adoption, may have supported the growth in U.S. exports to West African countries.

**Poultry:** U.S. exports of poultry to SSA increased by \$182 million (28.3 percent CAGR) to \$465 million during 2016–18 (table ES.1), with most of the exports going to Angola and South Africa in the form of frozen cuts and offal. Growth in population, incomes, and urbanization in SSA countries drove demand for U.S. exports of frozen chicken cuts. U.S. exports to Angola also grew due to the resolution of a sanitary and phytosanitary issue in 2016.

## U.S. Exports of Services to Africa

U.S. exports of private services to all African countries rose by \$1.6 billion (6.0 percent CAGR) to \$14.8 billion during 2016–2018. Cross-border exports of professional and management consulting services, financial services, air transport services, and telecommunications, computer, and information services grew the fastest. Travel services, which includes tourists' spending on lodging, meals, amusement, and entertainment, accounted for the largest share of U.S. services exports in 2018, followed by professional and management consulting services and by air transport services (passenger and freight). U.S. exports of air passenger transport services to SSA increased at a very slow rate during the period, likely because U.S. airlines served only a small number of SSA routes.

Several key factors contributed to the increase in financial services exports, including gains in financial inclusion (i.e., residents' access to banking and finance) in certain SSA countries; innovative digital solutions to financial infrastructure constraints (e.g., use of mobile banking apps); and the recent liberalization of several SSA financial services markets. U.S. exports in the professional and management consulting services sector were primarily driven by strong activity in the business and management consulting subsector and public relations services subsector, reflecting an improving business climate in many SSA countries. The education-related travel subsector has driven overall growth in U.S. travel services exports to Africa, due to the United States' well-known educational institutions, the convenience of receiving instruction in the English language, and the possibility of finding work in the world's largest economy. U.S. exports to Africa in all three of these services subsectors will likely continue to grow due to recent commitments to economic reform, the addition of air passenger flights and routes between the United States and Africa, higher incomes, and efforts to promote U.S. educational institutions.

## **U.S. Imports of Goods and Services from SSA Countries during 2016–18**

U.S. imports from SSA countries in 2016–18 increased by \$4.9 billion (11.5 percent CAGR) to \$25.1 billion. The majority of this increase was in imports of crude petroleum from Nigeria and precious metals, non-numismatic coins, and diamonds from South Africa. U.S. imports under AGOA also rose during this period. Crude petroleum and petroleum products from Nigeria were the main driver behind the \$2.0 billion (12.9 percent) increase in U.S. imports under AGOA, accounting for about three-quarters of the overall increase in U.S. imports under AGOA.

## **Fastest-growing U.S. Imports of Goods from SSA Countries and Top Growth Markets during 2016–18**

The fastest-growing U.S. imports of goods from SSA represent a range of sectors, including, among others, natural resources, metals, and agricultural products (table ES.3).

**Table ES.3** Fastest-growing U.S. imports of goods from SSA countries, by leading growth product, 2016–18

Product	2016	2017	2018	Absolute	Compound
				change	annual growth
				2016–18	rate 2016–18
			Million \$		%
Crude petroleum	7,258	10,160	9,252	1,994	12.9
Precious metals and non-numismatic coins <sup>a</sup>	1,501	2,086	2,443	941	27.6
Natural and synthetic gemstones	1,482	1,856	2,273	792	23.9
Spices	242	436	542	300	49.7
Ferroalloys	346	680	597	251	31.3
Certain ores, concentrates, ash, and residues	484	597	717	232	21.7
All other	8,847	9,042	9,252	405	2.3
<b>Total</b>	<b>20,160</b>	<b>24,857</b>	<b>25,075</b>	<b>4,915</b>	<b>11.5</b>

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016. Digest codes used for each sector are listed in the relevant chapters of this report.

<sup>a</sup>“Non-numismatic coins,” sometimes referred to as “bullion coins,” “non-circulation coins,” or “investment coins,” are valued and traded for their precious-metal content by investors and speculators, rather than for any historical or collector value that would be of interest to coin collectors (i.e., “numismatists”). However, almost all U.S. imports in this digest were of precious metals.

Leading source markets of U.S. imports of goods from SSA by absolute value change were South Africa, Nigeria, and Madagascar (table ES.4). The largest increase in percentage terms was in imports from Niger, which grew from \$12.4 million in 2016 to \$58.6 million in 2018 (117.4 percent CAGR). Of the top six source markets, the Republic of the Congo had the largest increase in percentage terms, growing 81.0 percent (table ES.4).

**Table ES.4** U.S. imports from SSA countries, by leading growth source markets, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual	
				2016–18	growth rate 2016–18	
		Million \$				%
South Africa	6,784	7,735	8,468	1,683	11.7	
Nigeria	4,172	7,050	5,617	1,444	16.0	
Madagascar	445	743	892	446	41.5	
Equatorial Guinea	193	356	580	387	73.2	
Republic of the Congo	132	128	433	301	81.0	
Ghana	321	750	581	260	34.5	
All other SSA	8,111	8,094	8,505	394	2.4	
Total from SSA	20,160	24,857	25,075	4,195	11.5	

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

## Factors Leading to Growth of U.S. Goods Imports from SSA during 2016–18

In general, the primary factors contributing to the growth of U.S. imports of goods from SSA were increased consumer demand from the United States, expanded production capabilities, and cost advantages in production in SSA. The increase in value of U.S. imports from SSA also reflects a large increase in average crude petroleum prices. Foreign-domestic partnerships were particularly important in the mining sectors in Botswana and South Africa. However, several SSA-wide factors, combined with some sector-specific conditions, were behind most of the increases in U.S. imports in particular sectors, as noted below.

**Crude petroleum.** While U.S. imports of crude petroleum from SSA increased by \$2.0 billion (12.9 percent CAGR) to \$9.3 billion (table ES.3), this increase was primarily due to an increase in price—the volume of U.S. imports of crude petroleum from SSA actually declined over the period. World prices for crude petroleum nearly doubled between January 2016 and September 2018.<sup>2</sup> Meanwhile, the volume of U.S. crude petroleum imports from SSA rose from 2016 to 2017, but then dropped substantially in 2018 (to below 2016 levels). As a result, the value of U.S. imports increased between 2016 and 2017, and the value (and volume) of U.S. imports declined moderately in 2018. The net decline in the volume of U.S. crude petroleum imports from SSA reflected the reduction in overall volume of U.S. crude imports, due primarily to an increase in U.S. domestic crude production.

**Precious metals and non-numismatic coins.** U.S. imports of precious metals and non-numismatic coins from SSA increased by \$941 million (27.6 percent CAGR) to \$2.4 billion (table ES.3), driven by imports from South Africa. Predominantly non-numismatic (investment) coins (especially Krugerrands of gold, silver, and platinum from South Africa) accounted for 0.9 percent of all products in the precious metals and non-numismatic coins digest which were imported by the United States from SSA countries in 2018. The majority of imports in this sector were in platinum-group metals (PGMs) and gold. The increase in imports of PGMs was in part due to increased demand associated with production of automotive emissions-control catalysts (which use PGMs) and the ability of SSA producers to guarantee a continuing

<sup>2</sup> EIA, “Spot Prices” (accessed July 25, 2019).

supply of PGMs. The increase in imports of gold from SSA was driven by an increase in U.S. gold consumption in high-end jewelry manufacturing.

**Natural and synthetic gemstones.** U.S. imports of natural and synthetic gemstones from SSA grew by \$792 million (23.9 percent CAGR) to \$2.3 billion (table ES.3). Diamonds were the predominant gemstones imported from SSA during 2016–18, with five countries—Angola, Botswana, Lesotho, Namibia, and South Africa—together accounting for 95.5 percent of all U.S. diamond imports from SSA in 2018. The increase in imports of diamonds was driven by an increase in U.S. consumer demand. U.S. demand trends are important for the global diamond market, as the United States is the largest diamond-consuming market in the world.

**Spices.** U.S. imports of spices from SSA increased by \$300 million (49.7 percent CAGR) to \$542 million (table ES.3). The product responsible for the majority of the increase in value of imports of spices from SSA was vanilla, which is almost exclusively sourced from Madagascar. This increase in value was due to rising global prices for vanilla.

**Ferroalloys.** U.S. imports of ferroalloys from SSA increased by \$251 million (31.3 percent CAGR) to \$597 million (table ES.3), with South Africa the main source of ferroalloys imported from SSA. Some of the growth in the value of imports of ferroalloys was attributed to an increase in prices. Another factor was the increased demand for ferroalloys from domestic steel producers in the United States in the face of limited domestic supply.

**Certain ores, concentrates, ash, and residues.** U.S. imports of certain ores, concentrates, ash, and residues from SSA increased by \$232 million (21.7 percent CAGR) to \$717 million (table ES.3). Three product groups contributing to the majority of the increase in imports were titanium-containing slag and titanium ores and concentrates (used in the production of paints); manganese ores and concentrates; and chromium ores and concentrates (both manganese and chromium are used in the production of steel). A rise in U.S. domestic residential and commercial construction led to growth in the demand for paint, while an increase in U.S. domestic steel production was a major factor behind the growth in demand for manganese and chromium ores and concentrates.

## U.S. Imports of Goods under AGOA during 2016–18

Nigeria, Ghana, and the Republic of the Congo were the fastest-growing source markets for U.S. imports under AGOA from 2016 to 2018 (table ES.5). Crude petroleum and ferroalloys were the two leading sectors of growth in U.S. imports of goods from SSA overall and under AGOA as well. Other leading sectors of growth included apparel, miscellaneous inorganic chemicals, petroleum products, and edible nuts.

Among leading source markets, Ghana had the highest AGOA utilization rate in 2018 (99.1 percent) followed by Kenya (98.0 percent) and Madagascar (93.7 percent).<sup>3</sup> These countries also had the highest utilization rate when excluding petroleum exports, while the rates of other top source countries such as Nigeria and Gabon are much lower when excluding petroleum (table ES.6).

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<sup>3</sup> The AGOA utilization rate is calculated as the value in U.S. dollars (USD) of imports from a country under AGOA divided by the value of imports from that country under the Harmonized Tariff Schedule of the United States (HTS) product codes eligible for AGOA preferences.

**Table ES.5** U.S. imports for consumption under AGOA, by leading source market, 2016–18

Country	2016	2017	2018	Absolute change	Compound
				2016–18	annual growth rate 2016–18
	Million \$				%
Nigeria	3,184	5,816	4,361	1,177	17.0
Ghana	66	345	357	291	132.1
Republic of the Congo	63	80	277	214	109.5
Côte d'Ivoire	71	103	218	148	75.8
Madagascar	97	155	194	97	41.4
Ethiopia	69	93	159	90	51.6
Gabon	60	100	148	88	56.5
Zambia	2	7	89	87	599.1
Kenya	396	408	470	74	8.9
All other SSA	6,435	6,544	5,827	-608	-4.8
Total	10,444	13,650	12,100	1,657	7.6

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

**Table ES.6** AGOA utilization rates, by leading source markets, 2016–18

Country	AGOA utilization rate, all imports (%)		AGOA utilization rate, imports excl. oil (%)	
	2016	2018	2016	2018
Ghana	96.5	99.1	96.5	97.0
Kenya	98.1	98.0	98.1	98.0
Madagascar	88.0	93.7	88.0	93.7
Nigeria	81.3	87.5	54.6	41.8
Gabon	61.9	81.9	1.2	0.0
Ethiopia	96.8	79.1	96.8	79.1
Zambia	86.0	69.4	86.0	69.4
Republic of the Congo	65.4	68.2	10.2	18.0
Côte d'Ivoire	81.9	58.1	81.9	46.5
Total (All SSA)	86.7	86.2	86.0	79.7

Source: USITC DataWeb/USDOC (accessed August 6, 2019).

Note: AGOA utilization rates are defined as the value of U.S. imports from a source market under AGOA divided by the value of imports of AGOA-eligible products from that source market.

**Apparel.** U.S. imports of apparel from SSA under AGOA increased by \$209 million (9.9 percent CAGR) to \$1.2 billion from 2016 to 2018, driven by imports from Madagascar, Ethiopia, and Kenya. The 10-year extension of the AGOA program and AGOA's third-country fabric provision allowed SSA countries to expand apparel production and were the primary causes of the increase in apparel imports from SSA. The third-country fabric provision permits manufacturers in AGOA-eligible countries to use non-U.S., non-AGOA fabrics in apparel exports entered under AGOA.

**Miscellaneous inorganic chemicals.** U.S. imports of miscellaneous inorganic chemicals from SSA under AGOA grew by \$95 million (36.8 percent CAGR) to \$204 million from 2016 to 2018. South Africa was the only source of U.S. imports of these products from SSA countries in 2016–18. The rise in imports of these products was due to increased domestic demand from U.S. producers of steel and automotive emissions-control catalysts, as well as a rise in the world prices of vanadium (primarily used in alloys), precious metal compounds, and carbides.

**Petroleum products.** U.S. imports of petroleum products from SSA under AGOA increased by \$81 million (15.6 percent CAGR) to \$320 million during 2016–18. The growth in the value of U.S. petroleum product imports from SSA under AGOA was due mainly to increased imports of heavy fuel oils from Côte d’Ivoire. The increased import value reflected a rise in the price of petroleum products and a higher share of heavy fuel oil imports entering under AGOA, as opposed to an increase in the volume of petroleum product imports. The volume of U.S. imports of heavy fuel oils from SSA (including those not entering under AGOA) was relatively flat, with the increase in the value of imports reflecting the increase in petroleum prices.

**Edible nuts.** U.S. imports of edible nuts from SSA under AGOA grew by \$64 million (28.2 percent CAGR) to \$163 million during 2016–18. The rise in imports of macadamia nuts from Kenya and South Africa was due to higher consumer demand for nuts, as nut consumption was increasingly seen to be an important part of healthy diets. Increased production of macadamia nuts in South Africa and Kenya also likely contributed to rising U.S. imports of such products from SSA.

## U.S. Imports of Services from Africa

During 2016–18, U.S. imports of private services from all African countries increased overall, with notable gains in imports of technical, trade-related, and other business services; research and development services; and travel services. The financial, travel, and air transport services segments represented roughly two-thirds of U.S. imports of private services from all Africa in 2018. U.S. imports of private services from all African countries increased at a CAGR of 11.4 percent during 2016–18, from \$8.1 billion in 2016 to \$10.1 billion in 2018.

Travel services accounted for the largest share (48.4 percent) of U.S. private services imports from Africa in 2018.<sup>4</sup> Both investment activity and the increasing maturity of African financial markets contributed to increased U.S. demand for financial services from local African institutions via cross-border trade and foreign affiliate sales during the period. Recent improvements and refinements to tourism marketing campaigns promoting the region’s natural and cultural attractions to potential foreign visitors were key factors driving the increase in U.S. imports of travel services from Africa. This increase in U.S. travel services imports from Africa also contributed to the recent increase in air transport services (including both passenger and freight transport by U.S. carriers).<sup>5</sup>

## Recent Developments in U.S. Foreign Direct Investment in SSA

In 2018, U.S. FDI stock in SSA totaled \$34.0 billion. The three largest destinations for cumulative U.S. FDI in SSA were Mauritius (\$9.5 billion), South Africa (\$7.6 billion), and Nigeria (\$5.6 billion). From 2016 to 2018, Mauritius experienced only a slight decrease in U.S. FDI (0.7 percent CAGR), while FDI in Nigeria

<sup>4</sup> USDOC, BEA, International Services Tables, table 2.3 (October 19, 2018).

<sup>5</sup> The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce does not publish data on U.S. cross-border services trade with SSA, only Africa as a whole. Africa includes SSA as well as Egypt, Libya, Algeria, Morocco, Tunisia, Western Sahara, and outlying islands. See USDOC, BEA, “Geographic Area Definitions,” n.d. [https://apps.bea.gov/international/bp\\_web/geographic\\_area\\_definitions.pdf](https://apps.bea.gov/international/bp_web/geographic_area_definitions.pdf) (accessed August 8, 2019).

grew at a 13.8 percent CAGR and in South Africa by a 7.0 percent CAGR. The increase in U.S. investment into South Africa primarily reflected substantial increases in investment in wholesale trade and in professional, scientific, and technical services. U.S. FDI into South Africa's manufacturing sector also experienced modest growth from 2016 to 2018 (a CAGR of 1.5 percent), with most of this growth occurring in the chemicals sector.

In Africa overall,<sup>6</sup> 31.7 percent of U.S. investment was in the mining sector, 29.0 percent in nonbank holding companies, and 8.8 percent in manufacturing. From 2016 to 2018, the mining sector experienced the largest decline in U.S. FDI stock, falling at a CAGR of 17.6 percent, followed by manufacturing FDI stock, which fell at a CAGR of 6.9 percent. The drop in U.S. FDI in the mining sector in SSA is largely due to a shift by U.S. firms to extraction of U.S. domestic oil and gas reserves, according to testimony provided at the Commission's public hearing. While the mining sector remained the largest destination for FDI in terms of value, the two largest sectors in terms of the number of actual projects chosen for FDI (via both greenfield investment and mergers and acquisitions) were in the services sector, specifically business services and software/information technology (IT) services.

## U.S. Firms' Integration with SSA Value Chains

SSA does not play a large role in global value chains (GVCs), and lags behind other major regional trading blocks in GVC participation. The majority of SSA's participation in GVCs was in the form of providing raw materials and primary inputs (e.g., crude petroleum, agricultural products, ores, or base metals) to other countries for downstream processing and export production. Externally, SSA's value chains are more integrated with Europe, followed by Asia and North America. Internally, SSA regional value chains are most often integrated between Eastern Africa and Southern Africa; within Southern Africa, South Africa serves as the major regional hub. Mining (including petroleum and natural gas extraction) topped SSA's GVC participation in absolute value terms. Transportation equipment (including motor vehicles) topped SSA's GVC participation given that it had the highest usage of foreign inputs. The level of GVC integration in agriculture and agribusiness in SSA is currently low. However, the sector can potentially benefit the most from the deepening of GVC integration. These key value chains present growth opportunities for extending and deepening U.S. firms' integration into SSA.

A number of structural and policy factors influence the degree and type of SSA GVC participation. Structural factors include domestic market size, income level, industrial competitiveness, the distance to manufacturing hubs, and infrastructure and logistics performance. Policy factors include trade policy measures such as tariffs and nontariff measures, the regulatory environment, regional trade agreements, and regional integration, such as via regional economic communities (RECs). These factors present opportunities as well as challenges for both SSA countries and U.S. firms in pursuing further GVC integration. Table ES.7 summarizes the key findings of the case studies on U.S. integration with value chains in SSA.

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<sup>6</sup> This includes U.S. FDI positions in mining in SSA, as well as in North African countries including Egypt, Libya, Tunisia, and Morocco, as BEA data do not break out U.S. FDI positions in mining in SSA separately from those in Africa as a whole.

**Table ES.7** Key findings of case studies on U.S. firms' integration in value chains in SSA

Value chain	Countries of focus	U.S. firms' current integration	Opportunities and challenges for future integration
Motor vehicle manufacturing	South Africa, Nigeria	Ford engages in integrated vehicle and engine manufacturing in South Africa and in kit manufacturing in Nigeria. Thirteen U.S. firms engage in automotive parts manufacturing in South Africa.	U.S. firms have made few investments in SSA because of limited automobile manufacturing outside of South Africa. SSA's large market size and greater regional integration, increased manufacturing capability, and improved government policies are expected to drive future opportunities in this sector.
Petroleum and natural gas extraction	Nigeria, Angola, Ghana, Mozambique, other SSA countries	Most of the major U.S. firms that engage in both petroleum and natural gas extraction, as well as oilfield services and supporting services, and that operate internationally are active in SSA.	Further U.S. integration into SSA's petroleum and natural gas extraction value chain will depend on global supply and demand factors, as well as regulatory developments and the economic and technical viability of resource endowments in SSA countries.
Agrifood processing for coffee and other beverages	South Africa, Nigeria, Ethiopia, other SSA countries	U.S. multinational firms engage in production in the SSA beverage sector, supplying inputs and producing beverages for the local market. In the SSA coffee sector, U.S. firms primarily purchase raw coffee beans, but are increasingly involved in creating more sustainable networks of growers.	Opportunities for significant U.S. involvement in the beverage value chain exist due to the fast growth of the SSA beverage sector, though challenges remain from policy uncertainty, special excise taxes, and weak transportation infrastructure. U.S. firms working in the coffee sector will likely face challenges developing regional, rather than country-specific, roasting and retail supply chains.

Source: Compiled by USITC.

## SSA's Intellectual Property Rights Environment

The laws and enforcement mechanisms for intellectual property rights (IPRs) in SSA are fragmented. Weak capacity for both implementation and enforcement is a primary barrier to increasing IPR protections in SSA countries. Each of the seven key markets (South Africa, Nigeria, Kenya, Ghana, Rwanda, Ethiopia, and Côte d'Ivoire) has its own statutory framework for protecting IPRs, though four of the countries are members of subregional intellectual property organizations such as the Organisation Africaine de la Propriété Intellectuelle (OAPI) and the African Regional Intellectual Property Organization (ARIPO). Both of these groups aim to streamline some aspects of the IP registration and enforcement processes. All SSA key markets except Ethiopia are parties to the WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which requires members to have in place laws and other measures to protect IPR. IPR infringement varies widely among SSA countries. However, it is generally higher in SSA than in other regions around the world, which likely hinders investment in SSA, particularly in industries which rely on copyright and trademark protections. Table ES.8 summarizes the key findings of the case studies on the IPR environment in SSA.

**Table ES.8** Key findings of case studies on the intellectual property rights (IPR) environment in SSA

Type of IPR	Country of focus	IPR policy issues	Impact on trade and investment
Patent	South Africa	The pharmaceutical patent filing system is moving from a depository process to a substantive review process. Other developments include the introduction of patent opposition prior to and following granting of patents, and allowing parallel importation.	Increased scrutiny of applications may encourage investment by weeding out non-genuine goods in the market. However, investors also anticipate lengthy processing delays and possible higher costs for firms filing patents which could reduce investment. Elements of this proposal could also increase access to generic medications for consumers.
Copyright	Nigeria	There is widespread copyright infringement of films in Nigeria due to lack of enforcement capacity, which has led to a highly informal film distribution market. Increased penalties for infringement have recently been introduced.	Copyright infringement and the film market structure discourage international investment and slow domestic growth, though foreign firms are purchasing distribution rights to some Nigerian films for digital streaming.
Trademark	Ethiopia	Infringement of international trademarks is pervasive in Ethiopia, due to lack of awareness and low enforcement capacity. Ethiopia is not a member of the WTO or key IPR agreements such as TRIPS, but after recent reforms, its IPR laws are generally in line with global standards. <sup>a</sup>	Recent IPR reforms have created a more predictable business environment and led to increased development of local products. However, some international firms have stopped investing due to the continuing prevalence of counterfeit goods.

Source: Compiled by USITC.

<sup>a</sup> Abdo, "Legislative Protection of Property Rights in Ethiopia," December 2013, 196.

## Agricultural Innovations in SSA

Agricultural innovations in SSA, such as biotechnology, supply chain traceability, or index-based crop insurance, raise agricultural production and export potential by improving the competitiveness of SSA agricultural products. This is achieved by reducing costs, differentiating products, and improving the reliability of supply. However, overall adoption of agricultural innovations in SSA is still low, and many hurdles exist to increasing adoption rates. The differences among SSA countries—including the level of economic development, governmental regulations, market conditions, farm economy characteristics, and specific agronomic conditions—create challenges for the adoption of new technologies.

In general, the large number of small-scale farmers (smallholders) and the fragmented production practices in most SSA countries limit producers' ability to consolidate farms into the scaled-up operations that are required for many of these innovations to have the greatest impact. To increase adoption of agricultural innovations in SSA, government and private groups are continuing efforts to educate farmers about the benefits of specific innovations; to support advances in digital and mobile payment systems that enable smallholders to participate in financial activities such as credit and risk management products; and to aid in the development of products that better fit local needs. Consumer

demand is also a growing driver of the adoption of other agricultural innovations, such as technology enabling supply chain traceability for certain crops such as cocoa.

Inconsistent regulations across the region and a lack of digital and agricultural infrastructure, such as irrigation and transportation networks, act as barriers that could limit the long-term, sustainable improvements in production that these agricultural innovations can provide. Additionally, national regulations such as those restricting the use of biotechnology in most markets other than South Africa continue to slow the adoption of agricultural innovations. Table ES.9 summarizes the key findings of case studies on the adoption of agricultural innovations in SSA.

**Table ES.9** Key findings of case studies on adoption of agricultural innovations in SSA

Technological innovation	Country of focus	Crop/market	How adoption affects production and export performance	Regulatory policies and market conditions that affect the sector
Biotechnology	Nigeria	Cotton seeds genetically engineered to carry the <i>Bacillus thuringiensis</i> gene <sup>a</sup>	Improved yield from genetically engineered seeds may lead to increased production. Growth in exports of cotton may be impacted by the domestic textile industry's capacity to absorb increased production of the fiber.	Government regulation of commercial use of biotechnology hinders adoption for many countries, but regional efforts to revive textile industry led to adoption by Nigeria.
Blockchain for supply chain transparency	Côte d'Ivoire	Cocoa for chocolate production	Price and time savings from adopting blockchain <sup>b</sup> reduces costs of certifying products as compliant with labor and sustainability standards and improves reliability of supply. Exports may grow, as demand for certified products continues to be strong.	Consumer demand for certified cocoa products drives adoption to improve the supply chain auditing process; high implementation cost could limit further adoption. Government policies do not play a major role in adoption.
Crop insurance	Kenya	Staple grains produced by smallholders	Adoption of index-based crop insurance protects farmers from the risk of loss, improving reliability of supply, and may positively affect production and exports.	Mobile phone penetration, lower price levels of new insurance products, and volatile global commodity markets increase adoption.

Source: Compiled by USITC.

<sup>a</sup> The *Bacillus thuringiensis* gene protects the cotton crop from pests, particularly the cotton bollworm.

<sup>b</sup> Blockchain is an immutable distributed digital ledger made up of blocks of data that are verified by user consensus rather than being maintained by a central authority.

## The Digital Economy in SSA

The market for digital technologies in key SSA markets has grown in recent years, driven by increases in mobile phone penetration, the expansion of high-speed internet, and growth in consumer spending power. Adoption of digital technologies is changing traditional services and manufacturing sectors by making firms more productive, improving cost competitiveness, and creating new distribution channels

for products and services. However, certain policies can hinder trade and investment in the digital economy. Of particular importance are restrictions on the cross-border transfer of data, which affect all sectors, and restrictions on obtaining government licenses, which primarily affect specific sectors, including financial services and telecommunications. On the other hand, having regulatory frameworks in place for certain important sectors for protecting data privacy can help facilitate trade and investment in the digital economy.

While U.S. firms are the leading suppliers of many of these technologies worldwide, their market position in SSA is varied. U.S. firms are the predominant providers in some sectors, such as cloud computing, digital streaming video, and drone delivery services. However, in others, such as financial technology and e-commerce, U.S. firms are more heavily involved in providing the infrastructure or investment that facilitate the creation of these products rather than providing these products directly in SSA. Table ES.10 summarizes the key findings of case studies on the digital economy in SSA.

**Table ES.10** Key findings of case studies on the digital economy in SSA

<b>Industry</b>	<b>Countries of focus</b>	<b>U.S. firm involvement</b>	<b>How adoption affects other sectors</b>	<b>Regulatory policies and market conditions that affect the sector</b>
Cloud computing	South Africa, Nigeria	Microsoft is the only provider of infrastructure as a service (IaaS) in SSA, with a large-scale data center in South Africa. Other U.S. IaaS providers also access firms in SSA where internet infrastructure is sufficiently developed.	IaaS creates an ecosystem for software and app developers to build new products on the IaaS network and sell them into SSA markets. Cloud IaaS also provides the processing power needed to support Internet of Things devices, by aggregating and processing data from multiple devices.	Data localization requirements present a challenge to cloud IaaS services by fragmenting the global network on which IaaS providers depend.
Financial technology (fintech)	Nigeria, Kenya, other SSA markets	U.S. firms provide some financial services directly to SSA, but they more often invest in, or form partnerships with, SSA firms in the fintech sector.	Fintech increases financial inclusion and facilitates domestic and cross-border transfers of money, which also facilitates many other types of businesses that require secure payment systems and access to credit.	Complex financial and telecom regulations affect fintech in SSA. These regulations differ significantly between countries, which hinders adoption in some markets.
E-commerce	South Africa, Nigeria	U.S. firms supply a small amount of cross-border services but are not yet major players in SSA.	E-commerce connects sellers (including small-and medium-sized enterprises) to buyers, facilitating the supply of new products to markets. It also provides opportunities for logistics and delivery services.	Deficiencies in delivery logistics and payments, including a lack of supporting services that facilitate e-commerce, are a significant impediment, giving rise to the unique business model currently employed by domestic SSA firms to address these deficiencies.

Industry	Countries of focus	U.S. firm involvement	How adoption affects other sectors	Regulatory policies and market conditions that affect the sector
Digital streaming video	South Africa, Nigeria	U.S. firms like Netflix and YouTube are major suppliers of digital video in different market segments in SSA.	Video-on-demand streaming is changing the video and film market throughout SSA and displacing DVDs and video compact discs (VCDs) as a key distribution and consumption channel.	Slow buffering (preloading of data just before use) and high data costs have been a major barrier for streaming services in SSA.
Internet of things	Rwanda, Ghana	One U.S. firm—Zipline—is the predominant provider of drone delivery services in SSA, and U.S. firms also supply “smart cities” technologies to SSA governments.	Drone delivery services allow health services to provide more timely access to critical medical supplies. Smart cities technologies enable SSA markets to deliver key municipal services more efficiently.	Navigating current regulations and acquiring waivers for drone delivery services remains a challenge; integrating smart cities technologies with other government initiatives is also challenging for firms.

Source: Compiled by USITC

## Selected Strategies for AGOA Utilization

The most recent extension of the African Growth and Opportunity Act (AGOA), authorized by the Trade Preferences Extension Act of 2015, encouraged beneficiary countries to develop national AGOA strategies to improve their AGOA utilization rates. The act urged the African Union’s Regional Economic Communities (RECs) to do the same on a regional level.

As of November 2019, 16 out of 39 AGOA beneficiary countries have prepared specific AGOA strategies—typically working with the U.S. Agency for International Development.<sup>7</sup> Although these strategy documents are at various stages of development, they all have the same goal: to enhance AGOA utilization by identifying sectors that have the potential to increase exports to the United States under AGOA. Table ES.11 lists the SSA countries that have completed national AGOA strategies in certain industries.

**Table ES.11** AGOA beneficiaries that have completed national AGOA strategies in high-priority industries and products

AGOA beneficiary country	Strategy year	Agricultural and food processing	Textiles, apparel, footwear, and leather products	Jewelry and mining	Handicrafts	Other light manufacturing
Botswana	2017	•	•	•	•	
Ethiopia	2015	•	•			
Ghana	2016	•	•	•	•	
Kenya	2018 <sup>a</sup>	•	•		•	
Lesotho	2016	•	•	•	•	

<sup>7</sup> Burundi has a national AGOA strategy but has been suspended from receiving AGOA benefits since January 1, 2016. Executive Office of the President, Proclamation 9383, December 21, 2015.

AGOA beneficiary country	Strategy year	Agricultural and food processing	Textiles, apparel, footwear, and leather products	Jewelry and mining	Handicrafts	Other light manufacturing
Madagascar	2015	•	•	•	•	
Malawi	2018	•	•	•		•
Mali	2016	•	•	•	•	
Mauritius	2013	•	•	•		•
Mozambique	2018	•	•	•		•
Rwanda	2016	•	•		•	
Senegal	2015	•	•		•	•
Sierra Leone	2019	•	•			
Tanzania	2016	•	•		•	
Togo	2017	•	•	•	•	
Zambia	2018 <sup>a</sup>	•	•		•	

Source: Compiled from national AGOA strategy documents, including strategy document drafts.

Note: Burundi has a national AGOA strategy but has been suspended from receiving AGOA benefits since January 1, 2016. Executive Office of the President, Proclamation 9383, December 21, 2015.

<sup>a</sup> Strategies have been updated from a previous version.

Two RECs have also put together AGOA strategy documents. The strategy of the Common Market for Eastern and Southern Africa (COMESA) seeks to leverage short-term benefits from AGOA preferences into long-term improvement and diversification of the region's export sector by using the preferences to build up its members' light manufacturing and agroprocessing sectors. The strategy of the Economic Community of West African States (ECOWAS) identifies barriers to regional integration that undermine member states' ability to use AGOA preferences effectively.

Utilization of the preferential tariff treatment offered under both AGOA and the Generalized System of Preferences (GSP) among beneficiaries is inconsistent. Some countries, like South Africa and Lesotho, achieve high utilization across multiple measures, while other countries barely use the preferences at all. Many of these differences can be explained by noting what export sectors a country specializes in. While clothing producers benefit greatly from AGOA, a number of low-utilization countries primarily export non-AGOA-eligible goods, some of which have low or zero tariffs without AGOA or GSP. Their AGOA-eligible exports are only a small fraction of their total exports, so exporters may lack awareness of the AGOA program or not have the capacity to meet administrative requirements. Countries with higher shares of AGOA-eligible exports typically also have higher AGOA utilization rates.

## Recent Developments in SSA Regional Integration

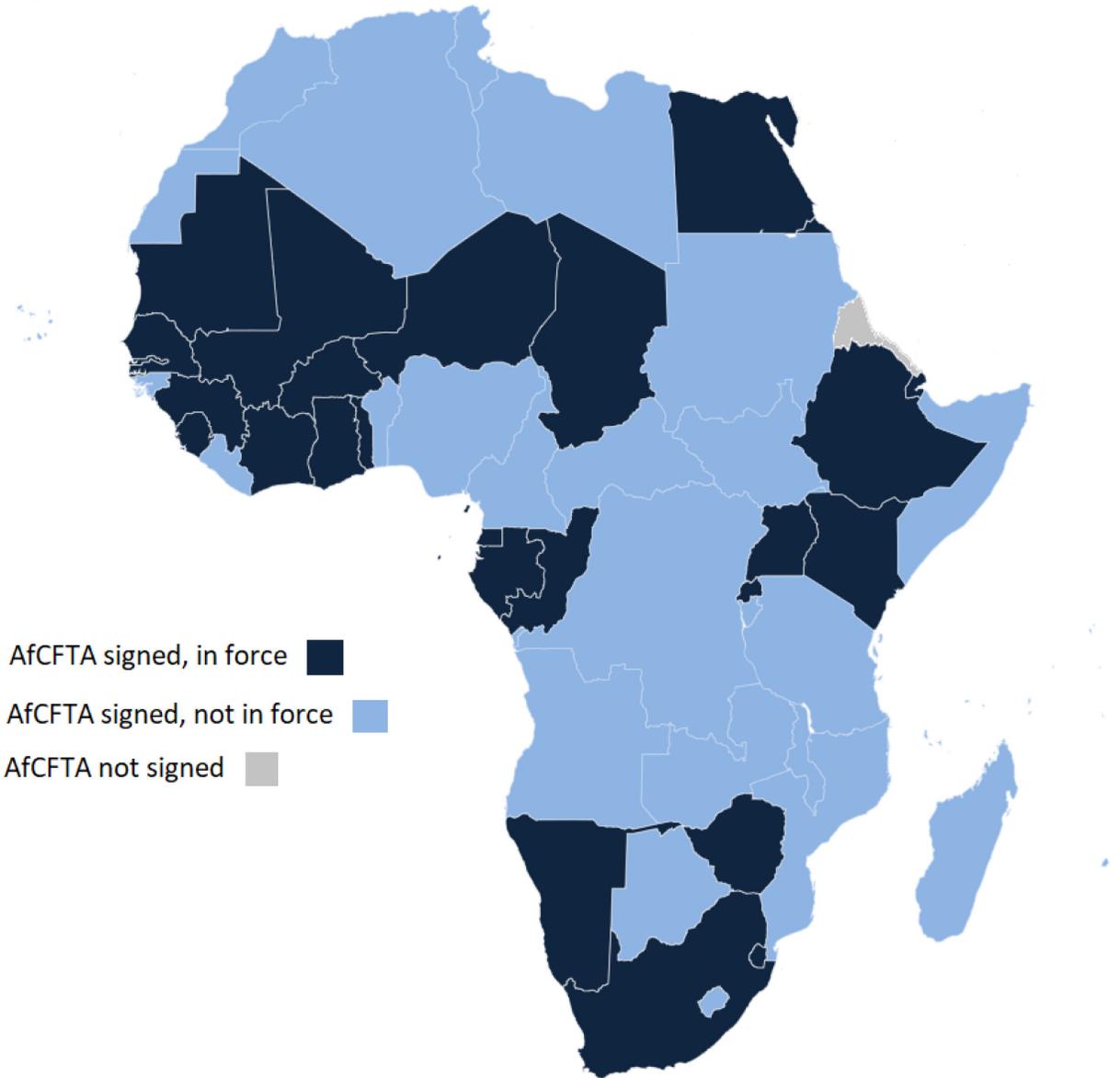
Many African governments are actively working to increase intra-African trade (African countries' trade with each other) via regional integration, typically through the establishment of free trade areas. Policy makers nonetheless view intra-African trade as having room for growth. Compared to intra-regional trade among members of the European Union and the Association of Southeast Asian Nations (among the most integrated regional trading blocs), intra-African trade is low, but it is growing rapidly from a small base. Weak regional value chains and a lack of complementary exports among African countries are two major factors preventing African governments from increasing intra-regional trade. Other regional challenges in Africa include difficulty achieving economies of scale, relatively high regional tariffs, and high costs of doing business.

The groundwork for the African Continental Free Trade Area was laid decades ago, but progress was slow for many years. However, recent negotiations for the text of the agreement moved quickly once they officially began. The African Union (AU) first announced the African Continental Free Trade Area (AfCFTA) negotiations in 2015, and by October 2, 2019, 54 out of 55 members had signed the consolidated text of the agreement. As of February 2020, the only AU member country that has not signed the agreement is Eritrea.

The AfCFTA entered into force on May 30, 2019, for the 28 members that had deposited their ratification instruments with the AU Commission (figure ES.1). But at the time of writing of this publication, many details of the agreement had not yet been negotiated. “Entry into force,” for the AfCFTA, means that these countries have ratified the Protocol on Trade in Goods, the Protocol on Trade in Services, and the Protocol on Rules and Procedures on the Settlement of Disputes. However, members will continue to negotiate the annexes of these first three protocols, which set out countries’ commitments in the three areas mentioned, as well as the initial negotiations of the Phase II protocols, during the implementation and operational phase of the agreement. Schedules of tariff concessions and rules of origin are intended to be completed by May 2020, and trade under the agreement is scheduled to begin in July 2020, or once members have finalized the tariff schedules.

Phase II negotiations began in October 2018 and are planned to culminate in the adoption of legal instruments for intellectual property rights, competition policy, and investment by June 2020. These protocols are intended to establish cooperation, and do not include binding commitments. The various RECs (including the Tripartite Free Trade Area intended to unite Southern and Eastern African RECs, for which negotiations are still in progress) will continue trading under their respective trading regimes under the AfCFTA if these regimes are more integrated than the AfCFTA. The continental free trade area supersedes the RECs except in cases where a REC has achieved regional integration beyond that specified in AfCFTA.

**Figure ES.1** Map of the African Continental Free Trade Area



Source: USITC, based on Tralac, "African Continental Free Trade Area (AfCFTA) Legal Texts" (accessed October 17, 2019); AU, "List of Countries Which Have Signed, Ratified/Acceded to the Agreement," October 8, 2019.

# Chapter 1

## Introduction

### Purpose and Scope

This report, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments*, was requested by the U.S. Trade Representative (USTR) in a letter received by the U.S. International Trade Commission (USITC or Commission) on May 6, 2019.<sup>8</sup>

In his request letter, the USTR asked that the Commission conduct an investigation and provide a report on U.S. trade and investment with sub-Saharan Africa (SSA).<sup>9</sup> The USTR asked that the report focus primarily on the years 2016–18, but where appropriate examine longer-term trends since 2000. He also asked that the report focus on key SSA markets such as South Africa, Nigeria, Kenya, Ghana, Rwanda, Ethiopia, and Côte d'Ivoire.

More specifically, the USTR requested that the report contain the following information:

1. An overview of U.S. exports of goods and services to SSA, which should, to the extent information is available:
  - Identify the industry sectors in which U.S. exports of goods and services to SSA have increased the most, in both value and percentage terms, and indicate major factors behind this growth.
  - Identify the SSA countries to which U.S. exports of goods and services have increased the most, in both value and percentage terms, and indicate the major factors behind this growth.
  - Identify SSA countries to which U.S. outward foreign direct investment (FDI) has increased the most, in both value and percentage terms, and indicate major factors behind this growth.
  - Provide examples of how products and services from the United States integrate into key SSA value chains; identify possible opportunities for U.S. firms to better integrate into these value chains, where appropriate; and describe national or regional policies and other macroeconomic factors that may affect future demand for these U.S. products.
2. An overview of U.S. imports of goods and services from SSA, which should, to the extent information is available:
  - Identify the industry sectors in which U.S. imports of goods and services from SSA have increased the most, in both value and percentage terms, and indicate major factors behind this growth. Data on goods should include both total imports and imports under the African

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<sup>8</sup> Appendix A contains a copy of the request letter.

<sup>9</sup> In this report, SSA refers to the 49 African Growth and Opportunity Act (AGOA) countries listed in 19 U.S.C. § 3706, including South Sudan, which was added in 2012.

Growth and Opportunity Act (AGOA), including imports under the U.S. Generalized System of Preferences (GSP) program.<sup>10</sup>

- Identify the SSA countries in which exports of goods and services to the United States have increased the most, in both value and percentage terms, and indicate the major factors behind this growth. Data on goods should include both AGOA (including GSP) imports and total imports.
3. To the extent information is available, describe the intellectual property environment, including national and regional laws, enforcement measures, and infringement issues, in key SSA markets. Through case studies, describe the effects of the intellectual property environment on trade and investment in the key SSA markets.
  4. Provide a broad overview and examples of technological innovation in the SSA food and agricultural production, processing, and marketing system. This should include a broad description of SSA food and agricultural producers' use of technological improvements in such areas as crop and livestock nutrition and genetics (including biotechnology); machinery and equipment; data processing and analytics; and digital market information and risk management systems. Through case studies, describe how the adoption of such technological improvements has affected certain SSA food and agricultural producers' overall production and export performance. Additionally, describe current national and regional regulatory policies and market conditions in key countries in SSA that may affect the adoption of technological improvements in the SSA food and agricultural sector.
  5. Provide a broad overview of and describe recent developments in the digital economy for key SSA markets. Provide information on the market for digital technologies in those key SSA markets as well as the role of digital products and services from the United States. To the extent that data are available, describe the market for digital products and services, such as internet-connected devices, cloud computing, e-commerce, the Internet of Things, blockchain, and internet search and digital content, as well as how adoption of digital technologies affects other industry sectors, such as manufacturing and other services. Describe current national and regional regulatory and policy measures and market conditions in key countries in SSA that affect digital trade.
  6. Provide a summary of recent developments of regional integration efforts in SSA, including progress on the negotiation and implementation of the African Continental Free Trade Area.
  7. Briefly summarize the AGOA utilization strategies that have been developed by SSA countries.
  8. To the extent practicable, provide a summary of the most recent 2019 data on U.S. trade flows of goods with SSA.

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<sup>10</sup> AGOA expanded market access benefits for certain goods eligible for preferential treatment under the Generalized System of Preferences (GSP) program.

## Sources of Information and Approach

As requested, in preparing the report, the Commission focused primarily on the years 2016–18 as well as on long-term trends since 2000 where appropriate. The Commission has also provided the most recent 2019 data on U.S. goods trade with SSA in appendix J. The Commission reviewed and used pertinent trade and investment data, reviewed the relevant trade literature, and obtained information from industry sources through telephone and in-person interviews conducted by Commission staff during travel to the region. Commission staff traveled to Ethiopia, Ghana, Kenya, Nigeria, and South Africa, and conducted dozens of interviews with industry, academic, and government representatives from these five countries as well as several other SSA countries. The Commission also used information obtained at the Commission’s public hearing, held on July 24, 2019, and from briefs and other written submissions received in connection with the hearing and in response to the Commission’s notice of investigation published in the *Federal Register* on June 14, 2019.<sup>11</sup>

The data used in preparing this report come from a wide range of sources. The statistics on U.S. merchandise trade used in this report are official trade statistics published by the U.S. Department of Commerce (USDOC)’s Census Bureau. The Commission used services trade data published by the USDOC’s Bureau of Economic Analysis (BEA)<sup>12</sup> and by the World Trade Organization (WTO). Foreign direct investment data were largely drawn from BEA; the European Union’s Eurostat and other foreign-government data sources; the *Financial Times*’ fDi Markets database; and the Bureau van Dijk’s Zephyr database. Data related to the intellectual property environment in SSA are mainly drawn from the World Intellectual Property Organization, the Property Rights Alliance, and the U.S. Patent and Trademark Office.

Data on technological innovation in the SSA food and agricultural sector are mainly drawn from reports and other information from the U.S. Department of Agriculture, the Food and Agriculture Organization of the United Nations (FAO), and the Organisation for Economic Co-operation and Development (OECD). Other sources of information for the report included academic literature and industry reports; U.S. government publications; publications from regional organizations in SSA countries, such as the African Development Bank, and other international institutions, including the World Bank, the WTO, and the United Nations; and from foreign government sources, particularly SSA governments’ publications that set out their national AGOA strategies.

Case studies are used in this report to provide information on products, industries, and markets in SSA as they relate to U.S. integration in regional value chains, the intellectual property environment, technological innovation in agriculture, and the digital economy, as indicated by the USTR. In the chapter on regional value chains, case studies describe examples of and possible opportunities for U.S. firms to integrate into these value chains. In the chapter on the intellectual property environment, case studies describe the effects of the intellectual property environment on trade and investment. In the discussion of technological innovation in agriculture, case studies describe how the adoption of

<sup>11</sup> Appendix B contains a copy of the *Federal Register* notice, appendix C contains the calendar of public hearing, and appendix D contains summaries of the views of interested parties.

<sup>12</sup> While disaggregated data on U.S. services trade with most SSA countries and with the SSA region as a whole are not available, BEA does publish limited data on U.S. services exports and imports to Nigeria and South Africa, as well as to all of Africa (which includes both SSA and the countries of North Africa).

innovations affects agricultural production and export performance. In order to illustrate developments in the digital economy, case studies describe the role of U.S. firms in supplying digital technologies and how the adoption of these technologies affects other industries. Additionally, case studies highlight national and regional policies and macroeconomic factors that affect these areas.

## Organization of the Report

This report is divided into eight chapters. Following the introduction in chapter 1, chapter 2 provides an overview of U.S. exports of goods and services to SSA during 2016–18, identifying the leading sectors and SSA markets for these exports and key factors that have affected U.S. export growth.<sup>13</sup> Chapter 3 gives an overview of U.S. imports of goods and services from SSA countries during the same period, and also highlights key factors affecting import growth. Chapter 4 provides an overview of U.S. outward FDI to SSA, examining the SSA markets where U.S. FDI is most prevalent. Chapter 4 also presents three case studies on U.S. firms' integration into key SSA value chains.

Chapter 5 offers an overview of the intellectual property environment in SSA, as well as three case studies that describe the effects of this environment on trade and investment in key SSA markets. Chapter 6 provides an overview of technological innovation in the SSA food and agriculture sector, with three case studies that focus on how the adoption of these technologies has affected SSA agricultural production and export performance. Chapter 7 gives an overview of recent developments in the digital economy in SSA, including five case studies that describe the market for certain digital products and services and discuss factors that affect trade in these products and services. Chapter 8 concludes with a summary of strategies developed by SSA countries to improve their utilization of AGOA benefits. It also summarizes SSA's regional integration efforts to date, including the African Continental Free Trade Area, and discusses the impact of these initiatives on African countries' ability to trade with each other and the world.

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<sup>13</sup> The 2019 data on U.S. goods trade with SSA countries are included in appendix E. These data were not available until February 2020, which precluded a detailed analysis of them in the report.

# Chapter 2

## U.S. Exports of Goods and Services to SSA

### Introduction

This chapter provides an overview of U.S. goods and services exports to SSA countries for 2016–18 through a series of sector-specific profiles. It identifies the sectors and SSA countries to which U.S. exports have increased the most and examines the major factors behind this growth.

In the first part of the chapter, export data for goods are presented at both the sector and country levels, offering a broad overview of the sectors and countries where the most growth in absolute value terms has occurred.<sup>14</sup> This part includes a profile of the top seven destination countries and top six growth sectors that account for substantial shares of U.S. exports of goods to SSA. Next, sector profiles examine the U.S. goods exports to SSA that have increased the most during 2016–18 and describe the key factors behind this growth. These products were chosen for analysis because U.S. exports of them to SSA have increased the most in absolute value terms during 2016–18, and because they play an important role in infrastructure and overall regional development.

The second part of the chapter identifies and discusses factors that have led to growth in U.S. exports of services in certain sectors—specifically travel, financial, and air transport services—to SSA countries. These sectors were chosen for analysis because they are well-defined industries that account for substantial shares of U.S. cross-border services exports to Africa, and because U.S. exports of these services have increased during the period.<sup>15</sup>

### Key Findings

U.S. goods exports to SSA countries increased by \$2.4 billion in 2016–18, with a compound annual growth rate (CAGR)<sup>16</sup> of 8.5 percent (table 2.1). The U.S. goods sectors with the largest dollar increases in exports were petroleum products, aircraft, certain motor-vehicle parts, motor vehicles, liquefied petroleum gas, and poultry. The key factors behind this growth in U.S. exports include a rise in the price

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<sup>14</sup> The request letter also asks the Commission to identify the sectors in which U.S. exports to SSA have increased the most in percentage terms. Though these sectors saw significant increases in U.S. exports to SSA in percentage change terms, most started from a low base, and despite the high growth rates, were exported in relatively small amounts. Therefore, those sectors that showed the most growth in percentage change terms are included and profiled in appendix F.

<sup>15</sup> The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce does not publish data on U.S. cross-border services trade with SSA, only Africa as a whole. Africa includes SSA as well as Egypt, Libya, Algeria, Morocco, Tunisia, Western Sahara, and outlying islands. See USDOC, BEA, “Geographic Area Definitions,” n.d. [https://apps.bea.gov/international/bp\\_web/geographic\\_area\\_definitions.pdf](https://apps.bea.gov/international/bp_web/geographic_area_definitions.pdf) (accessed August 8, 2019).

<sup>16</sup> Unless otherwise specified, growth is expressed in CAGR.

of crude petroleum, which led to an increase in the price of exports of petroleum products; increased travel to and from SSA and within SSA, which contributed to increased aircraft exports; rising demand from SSA countries for a variety of goods; infrastructure improvement in SSA countries, which facilitated the movement of goods; and growth in U.S. production. For example, increasing demand from SSA countries has led to growth in U.S. exports of such products to SSA as motor-vehicle parts, aircraft, poultry, and petroleum products. Meanwhile, improvements to liquefied petroleum gas (LPG) infrastructure in some SSA countries have helped to drive up U.S. exports of LPG, while the development of several infrastructure projects related to bridge construction across the SSA region has contributed to rising U.S. exports of bridges and bridge sections to SSA.<sup>17</sup>

U.S. exports of private services grew 6.0 percent during 2016–18, increasing from \$13.2 billion in 2016 to \$14.8 billion in 2018. The fastest-growing categories of U.S. private services exports in both value and percentage terms during 2016–18 were professional and management services, financial services, air transport, and telecommunications. Key factors that have contributed to the recent increase in financial services exports include increased participation in the financial system in certain SSA countries, the opportunity for banks to earn higher returns in SSA markets, innovative digital solutions to financial infrastructure constraints, and the recent liberalization of several SSA financial services markets. U.S. exports to SSA in air transportation and travel will likely continue to grow due to the addition of air passenger flights and routes between the United States and SSA, rising income growth in SSA, and efforts to promote U.S. educational institutions.

## U.S. Exports of Goods to SSA Countries

### Fastest-growing U.S. Exports to SSA Countries

During 2016–18, U.S. goods exports to SSA countries increased by \$2.4 billion (8.5 percent CAGR).<sup>18</sup> The largest growth in dollar terms occurred in the petroleum products sector, which increased by 40.3 percent CAGR from \$688 million in 2016 to \$1.4 billion in 2018. As noted, this growth was largely due to the increase in the underlying price of crude petroleum during the period. Other U.S. exports to SSA also

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<sup>17</sup> Bridges and bridge sections is one of the sectors that showed the most growth in U.S. exports in percentage terms, and is profiled in appendix F.

<sup>18</sup> Most tables in this report present U.S. merchandise trade statistics using “total exports” and “general imports” as measures, except for data on U.S. imports entered with a claim of eligibility under trade preference programs such as the African Growth and Opportunity Act (AGOA). Such data require an analysis of U.S. “imports for consumption”. “Total exports” measures the total physical movement of goods out of the United States to foreign countries, whether such goods are exported from the U.S. customs territory or from a Customs bonded warehouse or a U.S. Foreign Trade Zone (FTZ). Total exports is the sum of domestic exports and foreign exports (also known as re-exports). “General imports” measures the total physical arrivals of merchandise from foreign countries, whether such merchandise enters the U.S. customs territory immediately or is entered into bonded warehouses or FTZs under Customs custody. U.S. “imports for consumption” measures goods that have been cleared by U.S. Customs and Border Protection to enter the customs territory of the United States with required duties paid. For more information about measures of U.S. merchandise exports and imports, see USITC, *The Year in Trade 2014*, July 2015; USITC, “A Note on U.S. Trade Statistics,” August 22, 2014, <http://www.usitc.gov/publications/research/tradestatsnote.pdf>.

rose, though a relatively small number of products accounted for the majority of U.S. good exports to SSA countries (table 2.1). The factors driving this growth are laid out in the individual sector profiles.

**Table 2.1** Fastest-growing U.S. exports to SSA countries, 2016–18

Product	2016	2017	2018	Absolute change	Compound annual	
				2016–18	growth rate (CAGR)	
					2016–18	
					Million \$	%
Petroleum products	688	1,032	1,355	667	40.3	
Aircraft, spacecraft, and related equipment	1,764	1,497	2,181	417	11.2	
Certain motor-vehicle parts	338	437	697	359	43.6	
Motor vehicles	834	876	1,165	331	18.2	
Natural gas and components	162	236	449	287	66.3	
Poultry	282	433	465	182	28.3	
All other products	9,415	9,556	9,555	140	0.7	
<b>Total</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>2,384</b>	<b>8.5</b>	

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Notes: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of related 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016;

[https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/trade\\_shifts\\_2017/digest\\_hts8\\_dir\\_10\\_2\\_2018.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/trade_shifts_2017/digest_hts8_dir_10_2_2018.pdf).

## Top Growth Markets for U.S. Exports to SSA during 2016–18

During 2016–18, South Africa and Nigeria were the two SSA countries to which U.S. exports of goods increased the most in absolute value terms. The other five markets which U.S. goods exports increased the most, in absolute value terms, are Ethiopia, Togo, Tanzania, Zambia, and Senegal (table 2.2).

**Table 2.2** U.S. exports to SSA countries, by leading destination markets, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual	
				2016–18	growth rate (CAGR)	
					2016–18	
					Million \$	%
South Africa	4,600	5,051	5,517	917	9.5	
Nigeria	1,895	2,173	2,686	792	19.1	
Ethiopia	826	877	1,308	482	25.8	
Togo	229	456	642	413	67.3	
Tanzania	158	145	332	174	45.1	
Zambia	82	85	195	114	54.7	
Senegal	184	208	289	105	25.2	
All other	5,510	5,070	4,897	-613	-5.7	
<b>Total</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>2,384</b>	<b>8.5</b>	

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

In some cases, such as for South Africa, Nigeria, and Togo, multiple product groups drove the increase in U.S. exports for these countries. For some other countries, the majority of the increase in U.S. exports

was accounted for by a single product group, such as aircraft, spacecraft, and related equipment for Ethiopia, Tanzania, and Zambia, and petroleum products for Senegal (table 2.3). The different product groups and developments within them are described further in the sector profiles. Rising exports of these groups made these seven countries the leading growth markets for U.S. exports during the 2016–18 period.

**Table 2.3** Biggest drivers of U.S. export growth to SSA, by leading destination markets, 2016–18

Country	Leading growth products
South Africa	Certain motor vehicle parts Construction and mining equipment Crude petroleum Petroleum products
Nigeria	Motor vehicles Petroleum products
Ethiopia	Aircraft, spacecraft, and related equipment
Togo	Petroleum products Natural gas components
Tanzania	Aircraft, spacecraft, and related equipment
Zambia	Aircraft, spacecraft, and related equipment
Senegal	Petroleum products

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Leading growth products are defined at the *Harmonized Tariff Schedule of the United States* (HTS) digest-sector level.

## Fastest-growing U.S. Exports of Goods to SSA Countries

### Petroleum Products

Petroleum products are primarily derived from refining crude petroleum. This product group includes products such as motor gasoline, diesel, kerosene, asphalt, lubricating oils, and residual fuel oils, among others.

### Overview of U.S. Exports

After substantial declines in 2015 and 2016, the value of U.S. petroleum product exports to SSA rebounded from 2016 to 2018.<sup>19</sup> U.S. exports of these products to SSA rose from \$688 million in 2016 to \$1.4 billion in 2018, a 40.3 percent increase. The growth in the value of exports from 2016 to 2018 mostly reflects increases in prices (due to higher prices for crude petroleum), although the volume of petroleum product exports also increased. The top destinations in SSA for U.S. petroleum product exports were Togo (a major transit hub for imports to West Africa), Nigeria, and South Africa.<sup>20</sup> The top U.S. petroleum product exports to SSA are motor gasoline, diesel, and jet fuel (table 2.4). In particular, U.S. exports of motor gasoline to South Africa and U.S. exports of both diesel and jet fuel to Togo grew

<sup>19</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 97.

<sup>20</sup> Lewis, “Tiny Togo Thinks Big,” June 11, 2015.

substantially in value and volume over the period.<sup>21</sup> U.S. exports of petroleum products to specific SSA countries can experience relatively large swings from year to year, reflecting the United States' relatively small market share in SSA for these products.<sup>22</sup>

**Table 2.4** Petroleum products: U.S. exports to SSA and selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
		Million \$			%
Petroleum products	688	1,032	1,355	667	40.3
Motor gasoline	182	195	349	167	38.5
South Africa	17	( <sup>a</sup> )	112	95	154.9
Nigeria	58	79	100	42	31.5
Togo	106	64	79	-27	-13.6
All other SSA	( <sup>a</sup> )	52	57	57	1,891.7
Diesel	82	216	307	224	93.0
Togo	0	69	188	188	( <sup>b</sup> )
Namibia	82	23	67	-16	-9.9
All other SSA	( <sup>a</sup> )	124	51	51	5,643.1
Jet fuel	121	188	220	99	34.8
Togo	56	122	140	84	57.8
All other SSA	65	66	80	15	11.3
All other products	303	432	480	177	25.8

Source: USITC DataWeb/USDOC (accessed July 23, 2019). All products are in digest EP05 Motor gasoline enter under HTS Schedule B statistical reporting numbers 2710.12.1510, 2710.12.1514, and 2710.12.1519; diesel is classified in Schedule B numbers 2710.19.1106, 2710.19.1109, and 2710.19.1112; and jet fuel enters under Schedule B number 2710.19.1600.

Notes: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of related 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016.

[https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/trade\\_shifts\\_2017/digest\\_hts8\\_dir\\_10\\_2\\_2018.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/trade_shifts_2017/digest_hts8_dir_10_2_2018.pdf).

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Unable to calculate.

## Key Factors Affecting U.S. Exports, 2016–18

Growth in U.S. exports of motor gasoline to SSA reflects increased import demand in South Africa and Nigeria. Global U.S. exports of motor gasoline grew by about 88 million barrels (17.1 percent CAGR) from 2016 to 2018, while U.S. exports of the product to SSA grew by 2 million barrels (26.8 percent CAGR).<sup>23</sup> South Africa accounted for the majority of the increase in exports to SSA, likely reflecting rising petroleum product consumption and a modest decline in utilization rates at the country's petroleum refineries.<sup>24</sup> South Africa has delayed implementing stricter fuel standards, and its refineries are not

<sup>21</sup> EIA, “Exports by Destination” (accessed September 6, 2019).

<sup>22</sup> The European Union (EU) and Middle East supply a large share of petroleum product exports to SSA and generally have shorter transportation routes to SSA markets. USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 97–100.

<sup>23</sup> USITC DataWeb/USDOC, SB 2710.12.1510, 2710.12.1514, and 2710.12.1519 (accessed October 16, 2019).

<sup>24</sup> South Africa's refinery throughput fell from about 464 thousand barrels per day (b/d) to 455 thousand b/d, while total refining capacity stayed at 520 thousand b/d. BP, “Oil: Refinery Throughput” and “Oil: Refining Capacity,” June 2019; EIA, “South Africa,” October 26, 2017.

currently able to produce fuels at the specifications required for emissions control technologies in newer vehicles to work properly.<sup>25</sup> Consequently, South Africa largely relies on imports to meet growing demand for cleaner fuels.<sup>26</sup> Nigeria also has delayed stricter fuel standards for its refineries, but raised the requirements for imported fuels in July 2018.<sup>27</sup> Rising U.S. exports to Nigeria were likely supported by the country's large gasoline demand and limited refinery utilization.<sup>28</sup> The growth in 2018 was concentrated at the end of the year, and may have been part of broader Nigerian efforts to minimize fuel shortages during the Christmas holiday in advance of the February 2019 general election.<sup>29</sup>

Growth in U.S. exports of diesel to Togo also reflects several factors: the high level of SSA demand for diesel in various applications, Togo's role as a hub for petroleum product trade, and Nigeria's recent switch to higher imported fuel standards. Diesel is used both as a transportation fuel and as a critical fuel for power generation in SSA (particularly as a backup source of power in countries with frequent outages).<sup>30</sup> Nigeria is actually the main source of petroleum product demand in West Africa, but high rates of piracy in Nigerian waters and congestion at Lagos, Nigeria's largest port, have encouraged traders to operate out of Togo instead.<sup>31</sup> In addition, in July 2018, Nigeria adopted a stricter sulfur limit of 50 parts per million (ppm) for diesel imports. This shift likely supported the 2018 growth in U.S. diesel exports to Togo, which included a \$67 million increase from 2017 in exports of diesel containing 500 ppm of sulfur or less.<sup>32</sup> U.S. exports to Namibia have also been relatively high, likely due to shortages of diesel supply in neighboring South Africa and Namibia's demand for low-sulfur diesel.<sup>33</sup>

Growth in U.S. exports of jet fuel to SSA was mostly driven by increased prices and a higher volume of exports to Togo.<sup>34</sup> Togo finished building a new expanded terminal at its international airport in Lomé in 2016, likely increasing the country's air traffic and demand for jet fuel (including U.S. exports). The new

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<sup>25</sup> Oirere, "Refining: Uncertainty Grips South Africa's Clean Fuels Program," April 2017; Walsh, "Moving toward Clean Vehicles and Fuels," June 2009, 12–14.

<sup>26</sup> Mathews, "Dim Prospects for South Africa's Refinery Sector," November 16, 2018.

<sup>27</sup> George, "Nigeria to Cut Sulfur in Fuels," March 13, 2018.

<sup>28</sup> OilVoice, "West Africa's Gas Sector Becoming a Hive of Activity," November 16, 2017.

<sup>29</sup> Payne and Cooper, "UPDATE 1—Nigeria Shores Up Fuel Needs," November 1, 2018.

<sup>30</sup> Nakweya, "Africa Grapples with Diesel Generators' Health Problems," April 2, 2019.

<sup>31</sup> Togo also serves as a hub for petroleum product exports destined for other SSA markets such as the Democratic Republic of the Congo, Angola, and Côte d'Ivoire. Energy Post, "How Offshore Lomé Threatens Nigeria's Petroleum Sector," January 31, 2018; Kazeem, "The Never-ending Congestion at Nigeria's Largest Port," December 20, 2018.

<sup>32</sup> A large share of U.S. refining capacity is paired with units capable of upgrading high-sulfur intermediate products to low-sulfur diesel. Specific data are not available for diesel exports under 50 ppm sulfur. EIA, "More Stringent Marine Sulfur Limits Mean Changes," February 4, 2019; USITC DataWeb/USDOC, SB 2710.19.1106 and 2710.19.1109 (accessed September 18, 2019).

<sup>33</sup> For example, some mining industries in Namibia and other parts of southern Africa have switched to using low-sulfur diesel to manage their environmental impact and to ensure compatibility with new equipment built to international standards. Moolman, "New Directive Will Affect Mining Vessels," February 23, 2018; MyBroadband, "Petrol Shortage Crisis Looming in South Africa," June 5, 2016; Economist, "Why the Lights Keep Going Out," February 21, 2019.

<sup>34</sup> The volume of U.S. jet fuel exports to SSA declined by 18 percent from 2017 to 2018; the increase in value reflects higher prices. USITC DataWeb/USDOC, Schedule B, number 2710.19.1600 (accessed September 18, 2019).

terminal was designed to accommodate up to three million passengers per year and is part of the Togolese government’s stated vision to make Lomé a hub for West African air travel.<sup>35</sup>

U.S. petroleum product exports to SSA have started to rebound from their 2016 dip, and growing SSA demand for fuels (in both transportation and power-generation applications) and lagging SSA refinery investments present an opportunity for further U.S. export growth. However, the relatively low U.S. market share in SSA and the presence of other, closer, and larger export markets for U.S. petroleum products suggests that U.S. exports to SSA may not grow substantially even if the U.S. supply and SSA petroleum product demand continue to rise.<sup>36</sup> The future value of U.S. petroleum product exports to SSA will also likely depend on crude petroleum prices, competition with petroleum product exports from Europe, and the evolution of SSA’s power sector and its refinery investments.<sup>37</sup>

## Aircraft, Spacecraft, and Related Equipment

This product group includes civilian aircraft (both commercial and private), balloons, helicopters, and gliders. It also includes engines and parts for these aircraft.<sup>38</sup>

### Overview of U.S. Exports

Civilian aircraft, engines, equipment, and parts accounted for the bulk of U.S. aircraft exports to SSA and in 2018 comprised 98.2 percent of total aircraft, spacecraft, and related equipment exports.<sup>39</sup> However, SSA is a relatively small market for U.S. exports of civilian aircraft, engines, equipment, and parts, accounting for just 1.6 percent of global U.S. exports in 2018.<sup>40</sup> Nonetheless, U.S. exports of aircraft, spacecraft, and related equipment to SSA increased from \$1.8 billion in 2016 to \$2.2 billion in 2018 (table 2.5).

Ethiopia was the largest destination for U.S. exports of civilian aircraft, engines, equipment, and parts in 2018, accounting for over half (50.7 percent) of total U.S. exports of these goods to the region in 2018. By comparison, the next five largest trading destinations in SSA (South Africa, Nigeria, Tanzania, Kenya, and Zambia) accounted for just 39.2 percent of these exports (table 2.5). Of these countries, only South Africa saw a decline in U.S. exports during 2016–18; however, U.S. exports to South Africa, Nigeria,

<sup>35</sup> African Aerospace, “There’s No Place Like Lomé . . .,” September 13, 2016.

<sup>36</sup> The top four markets for U.S. petroleum products in 2018 were Mexico, Canada, Brazil, and Chile; each received over \$4.0 billion of these U.S. exports. USITC DataWeb/USDOC (accessed March 13, 2019).

<sup>37</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 97–100; Malicier and Lanitis, “Oil Product Flows to West Africa,” August 23, 2018.

<sup>38</sup> Top U.S. manufacturers and exporters in the aircraft, spacecraft, and related equipment industry include Boeing, United Technologies, Lockheed Martin, Honeywell International, General Dynamics, Northrop Grumman, Raytheon, Textron (with Cessna, Beechcraft, and Hawker subsidiaries), L-3 Technologies, and Rockwell Collins. Thomas Net, “Top Aerospace/Aviation Companies and Manufacturers” (accessed September 23, 2019).

<sup>39</sup> For a complete list of products classified under civilian aircraft, engines, equipment, and parts (HTS 8800.00.0000) see USDOC, International Trade Administration, Office of Trade and Machinery, “AeroSchedB880000AffectedCodes,”

<https://www.trade.gov/td/otm/assets/aero/AeroSchedB880000AffectedCodes.pdf>.

<sup>40</sup> In 2018, U.S. total exports were \$130.7 billion. USITC DataWeb/USDOC, HTS subheading 8800 (accessed September 23, 2019).

Tanzania, and Zambia decreased in 2017 before increasing in 2018. Exports of civilian aircraft, engines, equipment, and parts are largely high-value, low-volume products that can fluctuate year to year.

**Table 2.5** Aircraft, spacecraft, and related equipment: U.S. exports to SSA and selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change	Compound annual growth rate (CAGR)
				2016–18	2016–18
Million \$				%	
Aircraft, spacecraft, and related equipment	1,764	1,497	2,181	417	11.2
Civilian aircraft, engines, equipment, and parts	1,675	1,423	2,142	467	13.1
Ethiopia	445	653	1,087	641	56.2
South Africa	326	284	323	-2	-0.4
Nigeria	97	54	181	84	36.6
Tanzania	8	4	168	160	345.7
Kenya	57	139	99	41	31.0
Zambia	1	1	67	66	625.4
All other SSA	740	288	217	-523	-45.9
All other products	89	74	40	-50	-33.0

Source: USITC DataWeb/USDOC (accessed October 15, 2019). All products are in digest TE013. Civilian aircraft, engines, equipment and parts enter under HTS Schedule B statistical reporting numbers 4011.30.0000, 4012.13.0000, 6812.90.0110, 6812.99.0010, 7007.11.0000, 8407.10.0020, 8407.10.0040, 8407.10.0060, 8409.10.0040, 8411.11.4010, 8411.12.4010, 8411.21.4010, 8411.22.4010, 8411.81.4010, 8411.82.4010, 8411.91.7010, 8411.99.7010, 8412.10.0090, 8525.10.6010, 8525.10.8020, 8525.20.3005, 8525.50.6010, 8525.50.8020, 8525.60.1025, 8526.10.0010, 8526.91.0010, 8527.90.9705, 8527.99.3005, 8543.70.4000, 8543.89.4000, 8801.00.0050, 8801.90.0000, 8802.11.0030, 8802.11.0045, 8802.11.0090, 8802.12.0040, 8802.12.0080, 8802.20.0015, 8802.20.0040, 8802.20.0050, 8802.20.0060, 8802.20.0080, 8802.30.0030, 8802.30.0040, 8802.30.0050, 8802.30.0060, 8802.30.0080, 8802.40.0040, 8802.40.0060, 8802.40.0070, 8802.40.0090, 8803.10.0010, 8803.20.0010, 8803.30.0010, 8803.90.9010, 8805.29.0000, 9014.10.1040, 9014.10.6040, 9014.10.7040, 9014.10.9040, 9014.20.2000, 9014.20.4000, 9014.20.6000, 9014.20.8040, 9029.20.4040, and 9401.10.0000.

Note: Due to rounding, figures may not add up to totals shown.

## Key Factors Affecting U.S. Exports, 2016–18

U.S. exports of civilian aircraft, engines, and parts to SSA grew between 2016 and 2018 in part because airlines' passenger volumes increased, driving up demand for aircraft. Ethiopian Airlines is the largest African airline, based on seat capacity and outstanding aircraft orders, and Addis Ababa, the capital of Ethiopia, is an important international transfer hub for the region. It flew increasing numbers of passengers during 2016–18, with passenger volume for the airline surpassing nine million in 2018—an annual increase of more than 18 percent.<sup>41</sup> Boeing, the United States' largest manufacturing exporter, supplied a majority of Ethiopian Airlines' current aircraft fleet and has a majority of the airline's future orders.<sup>42</sup> Between 2016 and 2018, Boeing delivered 14 aircraft to Ethiopian Airlines.<sup>43</sup> The airline has a

<sup>41</sup> Al Jazeera, "Ethiopian Airlines: Africa's Largest Air Carrier," March 10, 2019; CAPA, "Africa Aviation Outlook 2019," January 31, 2019.

<sup>42</sup> Boeing, "Boeing's U.S. Footprint" (accessed October 21, 2019); Ethiopian Airlines, "Ethiopian Current Commercial Fleet" (accessed October 21, 2019).

<sup>43</sup> Boeing delivered five 737 MAX aircraft, three 777F aircraft, and six 787-8 aircraft to Ethiopian Airlines between 2016 and 2018. For more information on Ethiopian Airlines, see the air transportation services and travel services

long history of operating Boeing aircraft, a trend extending back to 1962. In 2018, Ethiopian Airlines became the first African airline to fly Boeing’s 787 Dreamliner.<sup>44</sup> Ethiopian Airlines is an even larger part of the SSA airline market when its joint ventures and subsidiaries across Africa are considered. These include ASKY (Togo), Malawian Airlines (Malawi), Tchadia Airlines (Chad), and Ethiopian Mozambique Airlines (Mozambique).<sup>45</sup>

Kenya Airways is another growing SSA airline that operates a fleet mostly composed of Boeing aircraft and that expanded daily flights to New York, among other destinations, in 2018.<sup>46</sup> Air Tanzania, a relatively small airline in terms of fleet size, also expanded its flights after receiving a Boeing 787-8 Dreamliner in 2018, partially explaining the large increase in the value of U.S. exports to Tanzania in the same year.<sup>47</sup> The Dreamliner is Air Tanzania’s first aircraft capable of long-haul flights, and the airline plans eventually to fly passengers to the United States, Europe, and Asia.<sup>48</sup> By contrast, South African Airways is an example of an SSA airline that has not experienced recent growth and has been in financial trouble since 2011, leading South Africa’s Finance Minister to call for its closure.<sup>49</sup> South African Airways has also been relying more heavily on Airbus aircraft rather than Boeing aircraft. Boeing aircraft made up 46 percent of the airline’s passenger fleet in 2006, 19 percent in 2016, and 0 percent in 2019, partially explaining decreasing total U.S. exports to South Africa.<sup>50</sup> Overall, Boeing accounts for 70 percent of the commercial aircraft in service in Africa, with over 400 aircraft operating among more than 40 airlines.<sup>51</sup>

Higher infrastructure expenditures that support greater passenger volumes are likely to result in continued increases of U.S. exports of civilian aircraft and parts to SSA. For example, Ethiopia plans to build a new \$4 billion airport in Addis Ababa that is scheduled to be completed in 2024; there is also a \$540 million terminal expansion and runway rehabilitation project at South Africa’s Cape Town International Airport, and a \$553 million terminal expansion and runway rehabilitation at Uganda’s Entebbe International Airport.<sup>52</sup>

Major aircraft manufacturers forecast Africa to be an important market for future aircraft sales. Airbus projects that Africa will be a top-performing region in terms of aerospace infrastructure and aircraft

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sections in this chapter and in chapter 3. Boeing, “Deliveries January 2016 through December 2018” (accessed October 22, 2019).

<sup>44</sup> The fatal crash of Ethiopian Airlines flight 302 on March 10, 2019 involved a Boeing 737 Max 8, which sources indicate may put pressure on the relationship between the two companies. Dahir, “It Would Be Tough for Fast-growing Ethiopian Airlines,” March 19, 2019; Dahir, “Ethiopian Airlines Is Doubling Down,” March 27, 2019.

<sup>45</sup> CAPA, “Africa Aviation Outlook 2019,” January 31, 2019.

<sup>46</sup> CAPA, “Africa Aviation Outlook 2019,” January 31, 2019; Kenya Airways, “Kenya Airways Fleet” (accessed October 21, 2019).

<sup>47</sup> The list price for the Boeing 787-8 is \$248.3 million. Boeing, “About Boeing Commercial Airplanes” (accessed October 21, 2019); *Airlinerwatch*, “Air Tanzania Receives its First and Only Dreamliner,” July 9, 2018.

<sup>48</sup> Boeing, “787 Dreamliner to Become Part of Air Tanzania” (accessed October 21, 2019).

<sup>49</sup> BBC, “SAA ‘Should Be Shut Down,’ Says Finance Minister,” November 2, 2018.

<sup>50</sup> South African Airways still uses Boeing aircraft for cargo purposes. Deglmann, “Infographic: South African Airways’ Fleet Changes, 2006–16,” January 31, 2017; Kruger, “What Happened to South African Airways’ Boeing?” October 19, 2019.

<sup>51</sup> Boeing, “Boeing in Africa” (accessed October 22, 2019).

<sup>52</sup> Airport Technology, “Mapping Africa’s Biggest Airport Projects,” July 23, 2018.

growth due to expanding markets, increasing population, and a growing middle class.<sup>53</sup> Boeing estimates that Africa's growing market will require 1,160 new aircraft between 2019 and 2039. According to major aircraft manufacturers, future aircraft demand is likely to shift away from smaller aircraft suited to regional travel to larger aircraft designed to meet demand for longer, higher-capacity flights. Three-quarters of new aircraft would be intended to meet additional passenger demand, while the remaining quarter would replace Africa's aging fleets.<sup>54</sup>

## Motor Vehicle Parts

Motor vehicle parts are intermediate inputs used either to produce motor vehicles as the final product or to serve as replacement inputs into pre-existing motor vehicles.<sup>55</sup>

### Overview of U.S. Exports

Stronger demand from South Africa, SSA's largest market for motor vehicle parts, drove the majority of increased U.S. motor vehicle parts exports to SSA during 2016–18. U.S. exports of these goods to SSA in 2018 were nearly \$360 million higher than in 2016 (table 2.6). U.S. motor vehicle parts exports to SSA were primarily destined for South Africa, Nigeria, Benin, and Zambia; these four countries accounted for 89.0 percent of such exports to SSA during this period. Exports to South Africa made up more than half of increased U.S. exports of motor vehicle parts to SSA during 2016–18, followed by Nigeria, Benin, and Zambia.

These exports were concentrated in only a few subcategories of parts.<sup>56</sup> Demand for replacement parts drove much of the exports to these countries, with only South Africa having a fully integrated vehicle manufacturing industry with strong demand for motor vehicle parts as inputs in vehicle manufacturing.<sup>57</sup>

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<sup>53</sup> Airbus, "Global Market Forecast, Global Networks, Global Citizens, 2018–2037," 2018, 115.

<sup>54</sup> Africa as a whole currently has the world's oldest fleet of aircraft, averaging around 13 years old, with only 7 percent of the fleet consisting of newer-generation aircraft. Airbus, *Global Market Forecast: Global Networks, Global Citizens*, 2018, 120; Boeing, *Commercial Market Outlook 2019–2038*, 2019, 62.

<sup>55</sup> Motor vehicle parts discussed under this section are covered under USITC digest TE010.

<sup>56</sup> Those products are classified under Schedule B statistical reporting numbers 8708.99.8175, 8708.40.1150, 8708.29.5170, and 8708.50.7200. Motor vehicle parts are primarily imported under Harmonized System (HS) heading 8708. Some parts are in other headings, including engines (8413) and seats (9401 and 9403).

<sup>57</sup> Fully integrated manufacturing is an industry term to differentiate high-level vehicle assembly, where a large portion of the value of the vehicle is created during assembly, from lower-tech "kit assembly," which is bolting or welding large parts together that were assembled elsewhere, with little value added. For more information on automobile manufacturing in South Africa, see case study 4.1 in chapter 4.

**Table 2.6** U.S. exports of motor vehicle parts to SSA by country, 2016–18

Country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR) 2016–18
		Million \$			%
Motor vehicle parts	338	437	697	359	43.6
South Africa	199	258	413	214	44.1
Nigeria	49	74	131	82	63.5
Benin	32	37	47	15	21.2
Ghana	17	24	19	2	5.7
All other SSA	41	44	87	46	45.7

Source: USITC DataWeb/USDOC (accessed October 15, 2019). All products are in digest TE010. Certain motor vehicle parts enter under HTS Schedule B statistical reporting numbers 8413.30.1000, 8413.30.9000, 8413.91.1000, 8544.30.0000, 8708.10.0010, 8708.10.0050, 8708.21.0000, 8708.29.0010, 8708.29.5025, 8708.29.5170, 8708.30.0010, 8708.30.0050, 8708.40.1110, 8708.40.1150, 8708.40.3500, 8708.40.8000, 8708.50.4110, 8708.50.4150, 8708.50.7200, 8708.70.0050, 8708.80.0050, 8708.80.7000, 8708.91.5000, 8708.91.8000, 8708.92.5000, 8708.92.8000, 8708.93.5000, 8708.94.5000, 8708.94.8000, 8708.95.0000, 8708.99.5800, 8708.99.8115, 8708.99.8130, 8708.99.8175, 9401.20.0000, 9401.80.0000, 9401.90.1010, 9401.90.1080, 9403.40.9500, 9403.50.0000, 9403.90.1000.

Note: Due to rounding, figures may not add up to totals shown.

## Key Factors Affecting U.S. Exports, 2016–18

South Africa is the largest vehicle manufacturer in SSA and has the most vehicles in use.<sup>58</sup> Higher demand for motor vehicle parts as intermediate inputs in the manufacturing process, particularly from U.S.-headquartered vehicle manufacturers, is the likely cause of increased U.S. exports of motor vehicle parts to South Africa.<sup>59</sup> South Africa's total vehicle production rose only slightly, but commercial vehicle production increased significantly while car production declined. These trends may have led to changes in South African sourcing of automotive parts, since commercial vehicle parts may be supplied by different manufacturers in different countries than passenger vehicle parts.<sup>60</sup> Production by U.S.-headquartered companies in South Africa rose by about 1.5 percent from 2016 to 2018 (nearly 1,600 units).<sup>61</sup> Ford's production increased due to an investment in its Silverton facility to expand production of the Ranger (a pickup truck) and Everest (a sport utility vehicle) in 2016.<sup>62</sup> For more on the automotive supply chain in SSA, see case study 4.1 in chapter 4.

The other three major destinations for U.S. motor vehicle parts in SSA (Nigeria, Benin, and Zambia) were likely importing primarily replacement parts during 2016–18. Nigeria is a growing vehicle market, with the second-highest number of vehicles on the road among SSA countries, but currently has limited

<sup>58</sup> OICA, *Motorization Rate 2015—Worldwide* (accessed July 25, 2019).

<sup>59</sup> Motor vehicle parts supply two distinct markets, the original equipment manufacturer (OEM) market and the replacement parts market. SSA countries import motor vehicle parts from outside the region in addition to receiving supplies from within the region. UNCTAD, *Economic Development in Africa*, 2019, 153.

<sup>60</sup> South African production increased from 578,000 units in 2016 to 591,000 in 2018. Commercial vehicle production increased 12 percent (29,000 units), while passenger car production declined by 5 percent (16,000 units). Wards Intelligence, "South African Vehicle Production by Manufacturer, 2014–2018," July 5, 2019.

<sup>61</sup> While GM and PACCAR stopped production in South Africa, Ford increased its production there by nearly 19,000 units. Wards Intelligence, "South African Vehicle Production by Manufacturer, 2014–2018," July 5, 2019.

<https://subscribers.wardsintelligence.com/datasheet/south-africa-vehicle-production-manufacturer-2014-2018>.

<sup>62</sup> Bubear, "Ford's Production Capacity in South Africa," October 31, 2018.

vehicle production capacity (most Nigerian-made vehicles are assembled from kits).<sup>63</sup> In 2016, Nigeria increased its tariff on imported vehicles, an action that may have reduced the supply of vehicles and driven up demand for replacement parts to repair vehicles already on the road in Nigeria. Benin is often a transshipment point for goods destined for Nigeria, including motor vehicles and parts. Therefore, the increase in its imports of these goods from the United States may reflect growth in Nigerian demand.<sup>64</sup> Ghana has no vehicle production, and thus most of its parts imports are likely replacement parts. It is estimated to have the seventh-highest number of vehicles on the road among SSA countries.<sup>65</sup>

U.S. exports of motor vehicle parts to South Africa may rise in coming years to support Ford's increased investment in its South African production; in 2019, Ford added a third shift in one of its assembly plants and expanded production capacity to 168,000 units.<sup>66</sup> The finalization of the African Continental Free Trade Area (AfCFTA) could have competing effects on future U.S. exports of motor vehicle parts. Preferential tariffs for imports from other African countries may discourage growth of U.S. motor vehicle parts exports to SSA because the relative cost of U.S. parts compared to sub-Saharan African parts would increase; on the other hand, these preferences could potentially increase production of vehicles and parts by U.S. firms in SSA. Furthermore, the creation of the free trade area could also create economies of scale for vehicle and parts production within SSA, which could lead to new demand for U.S. motor vehicle parts.<sup>67</sup>

## Motor Vehicles

Motor vehicles are final products used primarily to transport either people or goods.<sup>68</sup>

### Overview of U.S. Exports

U.S. exports of motor vehicles to SSA countries grew by over \$330 million from 2016 to 2018 (18.2 percent CAGR) (table 2.7). Exports to Nigeria made up more than half of the 2018 export total, followed by those to Benin, Ghana, and South Africa. However, growth was variable across the region: exports to Nigeria increased by over \$410 million between 2016 and 2018, while exports to most other SSA countries declined over the three-year period. Benin ranked second in terms of U.S. exports in 2018 and is the only other SSA country for which these exports grew between 2016 and 2018.<sup>69</sup>

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<sup>63</sup> OICA, *Motorization Rate 2015–Worldwide* (accessed July 25, 2019). For more information on Nigeria's kit manufacturing, see case study 4.1 in chapter 4.

<sup>64</sup> Golub, "Entrepôt Trade and Smuggling in West Africa," September 2012, 1145–46.

<sup>65</sup> OICA, *Motorization Rate 2015—Worldwide*, database (accessed July 25, 2019).

<sup>66</sup> Rumney, "Ford to Add 1,200 Jobs, Shift," July 17, 2019.

<sup>67</sup> UNCTAD, *Economic Development in Africa*, 2019, 154–55.

<sup>68</sup> Motor vehicles discussed in this section are covered under USITC digest TE009. Motor vehicles primarily enter under HTS headings 8703 and 8704. There are 93 schedule B statistical reporting numbers for motor vehicles. Other headings in which motor vehicles are classified include special purpose vehicles (8701, 8702, and 8705), as well as bodies (8707) and chassis fitted with engines (8706).

<sup>69</sup> As mentioned in the previous section, since Benin is often a transshipment point for goods destined for Nigeria, the smaller increase in exports to Benin and its overall ranking as the second leading destination for U.S. exports is likely a result of increased final demand in Nigeria rather than in Benin itself. For more information, see Richards, "Importing Used or Salvage Vehicles," May 23, 2019.

**Table 2.7** Motor vehicles: U.S. exports to SSA and selected SSA countries, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
				2016–18	2016–18
		Million \$			%
Motor vehicles	834	876	1,165	331	18.2
Nigeria	238	346	649	411	65.0
Benin	112	116	132	19	8.3
Ghana	150	126	116	-34	-12.2
South Africa	149	123	87	-62	-23.5
All other SSA	185	165	182	-3.0	-0.8

Source: USITC DataWeb/USDOC, U.S. total exports to SSA countries (accessed July 2, 2019). All products are in digest TE009. Motor vehicles primarily classified in Schedule B under headings 8703 and 8704. There are 93 schedule B statistical reporting numbers for motor vehicles. Other headings in which motor vehicles are classified include special purpose vehicles (8701, 8702, and 8705), as well as bodies (8707) and chassis fitted with engines (8706).

Note: Due to rounding, figures may not add up to totals shown.

Most U.S. exports of motor vehicles to SSA countries are used vehicles. As shown in table 2.8, three of the top four subcategories for U.S. vehicle exports to SSA are specifically for used vehicles, and the fourth is a subcategory that does not differentiate between new and used vehicles. U.S. exports of the used motor vehicles in these top three subcategories accounted for 67.5 percent of all U.S. motor vehicle exports to SSA in 2018 (totaling \$787 million).<sup>70</sup> This apparent consumer preference for used vehicles instead of new is due to limited disposable incomes in SSA and the high costs of purchasing new vehicles.<sup>71</sup> The top three export markets for new vehicles (Nigeria, Benin, and Ghana) are also the top markets for used vehicle exports, and account for 86.3 percent of used vehicle exports to SSA countries in 2018 (totaling \$732 million).<sup>72</sup>

<sup>70</sup> USITC DataWeb/USDOC, U.S. total exports to SSA countries (accessed July 2, 2019). This total may underrepresent used vehicle exports to SSA, since some HS codes do not have subcodes specific to used goods. One paper estimated that, if subcodes specific to used goods existed for the HTS subheadings (Schedule B) where they currently do not, the data might show that total exports of used vehicles from the United States were as much as 13 percent higher in 2016 than estimated. Using the same methodology and applying it to the 2019 HTS, used vehicles could make up as much as 90.9 percent of 2018 exports to SSA. For more information, see Coffin et al., “Examining Barriers to Trade in Used Vehicles,” August 2016.

<sup>71</sup> Deloitte, “Navigating the African Automotive Sector,” April 2016, 4.

<sup>72</sup> USITC DataWeb/USDOC, U.S. total exports to SSA countries (accessed July 2, 2019). South Africa receives only \$1.7 million in U.S. exports of used vehicles, ranking 18th within the region in this category. The country that ranks 4th as a destination for U.S. exports of used vehicles is Senegal, which received \$26.6 million worth in 2018.

**Table 2.8** Motor vehicles: U.S. exports to SSA and selected HTS subheadings, 2016–18

HTS code	HTS description	2016	2017	2018	Absolute	Compound annual
					change	growth rate (CAGR)
					2016–18	2016–18
					%	
Million \$						
Motor vehicles		834	876	1,165	331	18.2
8703.23.0190	Used vehicles, with only spark-ignition internal combustion reciprocating piston engine of a cylinder capacity exceeding 1500 cc but not 3000 cc, n.e.s.o.i.	330	330	525	195	26.2
8703.24.0190	Passenger motor vehicles with only spark ignition internal combustion piston engine of a cylinder capacity over 3000 cc, used	112	112	162	50	20.2
8703.60.0045	Used vehicles, with spark-ignition internal combustion reciprocating piston engine and electric motors (w/ plug), exceeding 1500 cc but not 3000 cc, n.e.s.o.i.	N/A	68	100	( <sup>a</sup> )	( <sup>a</sup> )
8703.90.0100	Passenger motor vehicles, n.e.s.o.i.	70.4	61	90	19	12.8
All other		321	306	289	-32	-5.3

Source: USITC DataWeb/USDOC, U.S. total exports to SSA countries (accessed July 2, 2019). Motor vehicles are primarily classified in Schedule B under headings 8703 and 8704. Some motor vehicles are in other headings, including various special purpose vehicles (8701, 8702, and 8705), as well as bodies (8707) and chassis fitted with engines (8706). Each of these four statistical reporting numbers did not exist in the 2016 HTS. Trade data are therefore the export data for the closest corresponding code. Both 8703.23.0190 and 8703.60.0045 were previously part of 8703.23.0090 (along with 8703.40.0045), so the value is shown only once to prevent double-counting. Likewise, 8703.24.0190 was previously part of 8703.24.0090 (along with 8703.40.0090 and 8703.60.0090); 8703.90.0100 was previously part of 8703.90.0000 (along with 8703.80.)

Note: Due to rounding, figures may not add up to totals shown. N.e.s.o.i. = not elsewhere specified or included.

<sup>a</sup> Unable to calculate.

## Key Factors Affecting U.S. Exports, 2016–18

The key factors affecting U.S. exports to Nigeria and Benin, the two largest SAA destinations for U.S. vehicle exports, are interrelated. Nigeria has historically been one of the top five largest export destinations for U.S. exports of used vehicles, and a major destination for U.S. automotive exports in general.<sup>73</sup> However, U.S. exports of motor vehicles to Nigeria decreased steadily from \$1.2 billion in

<sup>73</sup> Coffin et al., “Examining Barriers to Trade in Used Vehicles,” August 2016.

2013 to \$238 million in 2016, before rebounding to \$649 million in 2018.<sup>74</sup> One factor explaining the decline in U.S. exports during 2013–2016, and its later resurgence, is the overall economic outlook of Nigeria during these years, which includes a recession officially beginning in 2016 and ending in the fall of 2017.<sup>75</sup> Moreover, in October 2013, the Nigerian government announced the creation of the Nigerian Automotive Industry Development Plan (NAIDP), which had the goal of discouraging vehicle importation and expanding domestic vehicle manufacturing.<sup>76</sup> The recent resurgence in U.S. exports to Nigeria is due, at least in part, to rules in the NAIDP which allow companies that manufacture or assemble cars in Nigeria to import vehicles while effectively paying only half the new tariff rate.<sup>77</sup> For more on the automotive supply chain in SSA and how firms responded to the NAIDP, see case study 4.1 in chapter 4.

The second-largest recipient of U.S. motor vehicle exports is Benin, and 60 percent of all automotive exports to Benin originate from the United States.<sup>78</sup> However, as mentioned earlier, Benin is a well-known transshipment hub for vehicles ultimately destined for Nigeria, as well as other West African countries.<sup>79</sup> Moreover, while there was an increase from 2016 to 2018 in U.S. motor vehicle exports to Benin, the larger trend of rising and falling U.S. exports to Benin was quite similar to the Nigerian trend, where the peak occurred prior to 2016. U.S. exports to Benin peaked in 2014 at \$540 million before declining to \$112 million in 2016 and beginning to rise again over the last three years, likely due to rising demand in Nigeria.<sup>80</sup> Since Nigeria is the largest final destination market for vehicles arriving in Benin, the temporary decline in Nigerian demand meant that demand for vehicles in Benin declined as well.<sup>81</sup> Moreover, the establishment of Nigerian vehicle assembly likely dampened demand for U.S. motor vehicle exports to Benin from 2016 to 2018. The presence of vehicle assembly in Nigeria also suggests that long-term demand for Nigerian imports from Benin may not grow as fast as in prior years.

## Natural Gas and Components

Natural gas is a mixture of hydrocarbons that are in a gaseous state at standard atmospheric conditions of temperature and pressure. It is composed primarily of methane, but also contains byproducts commonly known as natural gas liquids (NGLs): ethane, propane, butane, and pentanes. In the United States, NGLs are most often separated from methane and cleaned at gas processing plants, but they can also be produced from crude petroleum at refineries and petrochemical facilities.

<sup>74</sup> USITC DataWeb/USDOC, U.S. total exports to SSA countries (accessed August 30, 2019).

<sup>75</sup> Sasse and Carsten, “Nigeria Recession Deals Blow to Smuggling Hub Benin,” March 20, 2017. While the recession didn’t officially begin until 2016, GDP growth had been declining in Nigeria since 2014. For more information, see [https://www.imf.org/external/datamapper/NGDP\\_RPCH@WEO/NGA](https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/NGA).

<sup>76</sup> PwC, “Africa’s Next Automotive Hub,” 2015.

<sup>77</sup> Deloitte, “Nigeria’s Automotive Industry Plans: What Exactly Are the Expectations?” 2015; King, “National Automotive Industry Development Plan (NAIDP) Drives Car Sales to Record Levels in Nigeria,” July 22, 2014; USDOC, ITA, “Nigeria—Import Tariffs,” USDOC, August 13, 2019.

<sup>78</sup> Richards, “Importing Used or Salvage Vehicles,” May 23, 2019.

<sup>79</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 87.

<sup>80</sup> USITC DataWeb/USDOC, U.S. total exports to SSA countries (accessed August 30, 2019).

<sup>81</sup> Sasse and Carsten, “Nigeria Recession Deals Blow to Smuggling Hub,” March 20, 2017.

## Overview of U.S. Exports

U.S. exports of natural gas and components to SSA grew rapidly from 2016 to 2018, rising by \$287 million and increasing by 66.3 percent (table 2.9). These exports mostly consisted of butane and propane, which are often referred to as liquefied petroleum gas (LPG) and sold together as a blend.<sup>82</sup> U.S. exports of LPG to SSA increased from about 5 million barrels in 2016 to 10 million barrels in 2018 (33.8 percent CAGR).<sup>83</sup> The value of these exports rose by \$288 million (67.4 percent), supported by rising global prices for natural gas liquids.<sup>84</sup> Most of the largest SSA markets for U.S. LPG exports are concentrated in West Africa. U.S. exports have also been growing to Mauritius, due in part to the island's dedicated LPG import terminal and storage.<sup>85</sup>

**Table 2.9** Natural gas and components: U.S. exports to SSA and selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
	Million \$				%
Natural gas and components	162	236	449	287	66.3
Liquefied petroleum gas	160	234	448	288	67.4
Togo	0	60	124	124	( <sup>a</sup> )
Côte d'Ivoire	2	47	65	62	447.2
Mauritius	19	18	46	27	56.7
South Africa	35	11	44	9	11.9
Senegal	9	16	38	29	106.4
Ghana	70	55	32	-37	-32.0
All other SSA	25	26	99	74	98.1
All other products	2	1	1	-2	-42.0

Source: USITC DataWeb/USDOC (accessed July 23, 2019). All products are in digest EP06. Liquefied petroleum gas enters under HTS Schedule B statistical reporting numbers 2711.12.0000, 2711.13.0000, and 2901.10.1020.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Unable to calculate.

## Key Factors Affecting U.S. Exports, 2016–18

Although LPG has a wide variety of uses, it is primarily used as cooking gas in SSA and, to a lesser extent, as “autogas” to fuel vehicles.<sup>86</sup> LPG offers a cleaner-burning alternative to charcoal and fuelwood, commonly used cooking fuels in developing countries that contribute to indoor air pollution and deforestation. It is typically sold to end users in small, pressurized cylinders that keep the fuel in a liquid state until consumption, making it relatively easy to distribute and store.<sup>87</sup> There is high potential demand for LPG in SSA, but factors such as underinvestment in import and storage infrastructure, as well as complexities in the way the sector is regulated, can increase the price of LPG in SSA and disrupt

<sup>82</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 53.

<sup>83</sup> EIA, “Exports by Destination” (accessed September 3, 2019).

<sup>84</sup> EIA, “Natural Gas Spot and Futures Prices (NYMEX)” (accessed September 3, 2019).

<sup>85</sup> Stedman, “Inauguration of Petredec LPG Terminal,” March 20, 2014.

<sup>86</sup> For example, a large share of the LPG consumed in Ghana is used as autogas, diverted from subsidized supplies intended for use as residential cooking gas. Argus Media, “Interview with Renzo Bee,” February 2018.

<sup>87</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 53–54.

supply. Both of these factors discourage LPG consumption and lead to varying rates of use across SSA.<sup>88</sup> While the majority of households in Gabon, Mauritius, and Cabo Verde cook with LPG, the average penetration rate in West African countries is only about 15 percent.<sup>89</sup>

Improvements to LPG infrastructure contributed to rising U.S. exports to SSA from 2016 to 2018. In particular, in January 2017, the Nigerian National Petroleum Corporation acquired two new LPG vessels in a joint venture with Sahara Energy, a multinational conglomerate and leading marketer of crude petroleum and petroleum products in Africa.<sup>90</sup> One of the primary routes for these vessels has been delivering LPG from the U.S. Gulf Coast to ports in Côte d'Ivoire, Ghana, and Togo. Some of the stated goals of the venture include to “deepen the LPG market in West Africa” and to “achieve uninterrupted supply of the commodity and address infrastructural limitations.”<sup>91</sup> Other factors such as increased urbanization and government programs promoting LPG adoption may have also supported the growth in U.S. exports to West African countries.<sup>92</sup> Additionally, the 2014 startup of the LPG import terminal in Mauritius and 2017 opening of a new LPG terminal in South Africa likely supported rising exports to both countries from 2016 to 2018.<sup>93</sup>

Growing U.S. production of butane and propane also enabled rising LPG exports to SSA. U.S. net production of butane rose by 25.0 million barrels (9.6 percent CAGR) from 2016 to 2018. U.S. net production of propane also experienced moderate growth, rising by 82.2 million barrels (7.9 percent CAGR).<sup>94</sup> Most of the additional volumes of both butane and propane came from increased natural gas production. Global U.S. exports of LPG also grew over the period; in particular, U.S. exports of butane increased by 35.8 million barrels (37.5 percent CAGR).<sup>95</sup>

There is strong potential for future growth of U.S. exports of LPG to SSA, but actual growth will depend on the effectiveness of commercial and political efforts to increase LPG penetration in SSA. Construction of another LPG import and storage terminal in South Africa (planned to begin operations in 2020) will likely promote further U.S. exports to South Africa.<sup>96</sup> U.S. LPG exports to Ghana could also rebound after 2019 with the planned startup of the Bridge Power project, which will use LPG for power generation and

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<sup>88</sup> Argus Media, “Interview with Renzo Bee,” February 2018; Competition Commission of South Africa, *Market Inquiry into the LPG Sector*, March 2017.

<sup>89</sup> Argus Media, “Interview with Renzo Bee,” February 2018.

<sup>90</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 55.

<sup>91</sup> Sahara Group, “Sahara Gas Vessel Boosts LPG Availability,” July 2, 2018.

<sup>92</sup> Many countries in SSA have developed initiatives encouraging the use of LPG for cooking, including educational programs and subsidies for LPG and LPG cookstoves. The Economic Community of West African States (ECOWAS) also held a workshop in August 2018 focused on this issue. ECOWAS, “ECOWAS Seeks to Popularize,” August 10, 2018; USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 53–54.

<sup>93</sup> USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 44; Hellenic Shipping News, “TNPA to Prioritise Ship Repairs, Oil and Gas,” September 12, 2018.

<sup>94</sup> Net production includes both production from natural gas processing plants and the net production from refineries and blenders (excluding the butane and propane that are consumed by refineries and blenders). EIA, “Refinery and Blender Net Production” (accessed February 10, 2020); EIA, “Natural Gas Plant Field Production” (accessed February 10, 2020).

<sup>95</sup> EIA, “Exports by Destination” (accessed February 10, 2020).

<sup>96</sup> IHS Markit, “Storage Bullets Arrive for Richards Bay’s New LPG,” September 23, 2019.

ultimately triple Ghana's LPG import capacity.<sup>97</sup> The United States is also becoming a major global exporter of liquefied natural gas (LNG), but efforts to develop sufficient natural gas demand in SSA to support investment in LNG import infrastructure have not come to fruition.<sup>98</sup> However, SSA's local supply of both LNG and LPG could also increase as new and expanded LNG export facilities come online in Mozambique, Angola, Nigeria, and Equatorial Guinea, potentially increasing SSA's production of LPG and reducing demand for imports from outside of the region.<sup>99</sup> For more on the natural gas (LNG) supply chain in SSA, see case study 4.2 in chapter 4.

## Poultry

U.S. exports of poultry to SSA are primarily frozen chicken cuts, part of the poultry product group.<sup>100</sup> This product group consists of all poultry,<sup>101</sup> either live birds (HS 0105) or meat. Poultry meat may be fresh, chilled, or frozen (HS 0207), and some poultry products may be prepared or preserved (i.e., certain subheadings classified under HS 1602).

### Overview of U.S. Exports

From 2016 to 2018, U.S. poultry exports to SSA were one of the fastest-growing U.S. product groups by value. Angola and South Africa, in particular, grew in terms of importance as markets for U.S. poultry producers. U.S. exports of all poultry products to SSA grew by \$182 million over this period, at a CAGR of 28.3 percent (table 2.10). In 2018, the United States was the third-largest global supplier of poultry to SSA, by value, after the EU and Brazil.<sup>102</sup> In that year, U.S. poultry exports to all of SSA accounted for 11 percent of U.S. poultry exports to the world.<sup>103</sup>

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<sup>97</sup> Ghana's current oversupply of electricity may further delay the Bridge Power project or limit the project's initial LPG consumption. Sarkodie, "Lessons to Be Learnt from Ghana's Excess," August 5, 2019; African Energy, "Ghana: Construction Under Way at Bridge Power," December 13, 2018.

<sup>98</sup> Marks, "LNG-to-Power a Hard Nut to Crack," January 2, 2019.

<sup>99</sup> LNG facilities often use unprocessed natural gas transmitted via pipeline as feed gas and have equipment for separating NGLs. Depending on the liquids content of the feed gas, the facility may also have substantial production of LPG. MOGS Oil & Gas, "Sunrise Energy" (accessed September 9, 2019); NS Energy, "Nigeria LNG Plant Expansion, Bonny Island" (accessed September 9, 2019).

<sup>100</sup> Unless otherwise noted, portions of this section are based on the "Frozen Chicken Meat (Part of Poultry)" section of chapter 2 in USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, 92-96.

<sup>101</sup> Poultry includes chickens, ducks, geese, turkeys, and guinea fowls. Poultry is categorized under USITC industry commodity group AG005. See USITC, *Shifts in U.S. Merchandise Trade, 2017*, [https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/trade\\_shifts\\_2017/digest\\_hsts8\\_dir\\_10\\_2\\_2018.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/trade_shifts_2017/digest_hsts8_dir_10_2_2018.pdf).

<sup>102</sup> The EU-28 exported \$728.6 million, Brazil \$468.7 million, and the United States \$464.6 million of poultry products to SSA, in 2019. IHS Markit, Global Trade Atlas database, main module SSA regional grouping (accessed November 8, 2019).

<sup>103</sup> IHS Markit, Global Trade Atlas database (accessed November 8, 2019).

Frozen cuts and offal (HS 0207.14), referred to as “frozen chicken cuts,” accounted for 95.3–97.2 percent of U.S. exports of poultry products to SSA during 2016–18.<sup>104</sup> Growth in U.S. exports of frozen chicken cuts to Angola and South Africa accounted for nearly all of the absolute change in value (about 88 percent) of U.S. poultry exports from 2016 to 2018. In 2018, the top five SSA export markets for U.S. exports of frozen chicken cuts, by value, were Angola, South Africa, Ghana, the Republic of the Congo, and The Gambia.<sup>105</sup>

**Table 2.10** Poultry: U.S. exports to SSA and selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute	Compound annual
				change	growth rate (CAGR)
	Million \$			2016–18	2016–18
					%
Poultry	282	433	465	182	28.3
Frozen cuts and offal	274	414	443	169	27.2
Angola	85	155	184	98	46.7
South Africa	25	85	87	62	87.0
Ghana	42	52	45	3	3.7
Republic of Congo	38	43	45	7	8.2
Gambia	9	8	12	2	10.9
All other SSA	75	70	72	-3	-2.0
All other products	8	19	21	13	60.2

Source: USITC DataWeb/USDOC (accessed November 11, 2019). All products are in digest AG005. Poultry enters under HTS Schedule B statistical reporting numbers 0207.14.0090, 0207.27.0010, 0207.14.0010, 0207.27.0030, 0105.11.0020, 0207.12.0040, 0207.11.0040, 0207.14.0025, 0207.14.0050, 0207.27.0090, 0207.14.0030, 0207.14.0045, 1602.39.0025, 0207.27.0045, 0207.27.0050, 0105.11.0010, 1602.32.0090, 1602.32.0020, 0207.25.0000, 0207.42.0000, 0207.26.0000, 0207.13.0000, 0207.41.0000, 0207.12.0020, 1602.31.0020, 0105.15.0000, 1602.32.0050, 0207.45.0000, 1602.31.0090, 0207.24.0000, and 1602.31.0030.

Notes: Poultry includes chickens, ducks, geese, turkeys, and guinea fowl. Due to rounding, figures may not add up to totals shown.

## Key Factors Affecting U.S. Exports

In general, rising population, incomes, and urbanization in SSA countries drive demand for U.S. exports of frozen chicken cuts.<sup>106</sup> SSA consumers’ eating habits, especially in urban areas, have shifted to consuming more protein, and more fast food, which includes fried chicken.<sup>107</sup> On the supply side, the United States is one of the world’s top exporters of frozen poultry meat, and is poised to meet growing consumer demand for poultry in SSA with an abundant supply of frozen chicken cuts.<sup>108</sup> In some key SSA markets, there is little domestic poultry production: for example, Angolan poultry producers were able

<sup>104</sup> From 2016 to 2018, offal was only a small portion (less than 2 percent) of U.S. exports of “frozen chicken cuts and offal” to SSA countries. Thus, the rest of this section will focus on frozen chicken cuts. Calculations by USITC using USITC Dataweb/USDOC (accessed November 11, 2019).

<sup>105</sup> The top five SSA export markets for all of U.S. poultry products, by value, were slightly different from those for frozen chicken cuts: Angola, South Africa, the Republic of the Congo, Ghana, and Benin. USDOC, U.S. exports to SSA countries, by digest, 2016–2018 (\$), accessed July 2, 2019.

<sup>106</sup> USDA, FAS, *A Turning Point for Agricultural Exports*, November 2, 2015.

<sup>107</sup> Reuters, “Can Africa Deal with an Expected Boom in Demand?” March 13, 2017; Searcey and Richtel, “Obesity Was Rising as Ghana Embraced Fast Food,” October 2, 2017.

<sup>108</sup> USDA, ERS, “The United States Is the World’s Leading Poultry Exporter,” March 7, 2016.

to meet only 8 percent of Angola’s total market demand of about 320,000 tons of poultry per year in 2018.<sup>109</sup>

The fast growth rate in U.S. exports of frozen chicken cuts to SSA in 2016–18 was due, in part, to the United States’ return to a key export market—Angola—after the resolution of a sanitary issue. Before an outbreak of avian influenza in the United States in 2015, U.S. poultry exports to Angola had been increasing rapidly. Angola responded to the outbreak by banning imports of U.S. poultry products starting January 2015. It lifted the ban by the end of 2016, and the upward trend in sales resumed. U.S. exports of frozen chicken cuts to Angola grew by \$98 million (46.7 percent CAGR) and accounted for 31.1–41.4 percent of U.S. exports of these products to SSA (table 2.10). In fact, Angola became the third-largest export destination for U.S. poultry exports globally.<sup>110</sup> In addition, growth in urban population, a lack of domestic production capacity, and improvements in cold storage infrastructure drove Angolan demand for U.S. exports of poultry in 2016–18.<sup>111</sup>

Market access for U.S. poultry products in South Africa also improved over the period.<sup>112</sup> From 2016 to 2018, U.S. exports of frozen chicken cuts (U.S. chicken leg quarters) to South Africa grew by \$62 million (87.0 percent CAGR). Between 2001 and 2014, South African antidumping duty orders on imports of U.S. bone-in chicken portions effectively priced U.S. exports of frozen chicken cuts out of the South African market, one of the largest per capita consumers of poultry in SSA.<sup>113</sup> In 2016, however, South Africa established a tariff-rate quota of 65,000 metric tons (mt) per year for U.S. bone-in portions.<sup>114</sup> This occurred after negotiations with the United States in the lead-up to the renewal of the African Growth and Opportunity Act (AGOA).<sup>115</sup> Under the tariff-rate quota, U.S. exports that do not exceed the quota have a tariff rate of 37 percent, while the antidumping duty rate of 9.4 rand per kilogram (or \$0.30 per pound, about a 65 percent ad valorem equivalent<sup>116</sup>) still applies to all over-quota imports.<sup>117</sup> In market year 2016/2017, the United States filled 75 percent of the quota as U.S. exporters ramped up trade flows to South Africa.<sup>118</sup> For market years 2017/2018 and 2018/2019, the South African quota filled completely.<sup>119</sup>

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<sup>109</sup> USDOC, ITA, “Angola—Agricultural Products,” August 22, 2019.

<sup>110</sup> USDA, FAS, *Angola: Angola Becomes Third Largest Market*, April 19, 2019.

<sup>111</sup> USDA, FAS, *Angola: Angola Becomes Third Largest Market*, April 19, 2019.

<sup>112</sup> USITC, hearing transcript, 2019, 28 (testimony of Yoliswa Mvebe, Embassy of South Africa).

<sup>113</sup> U.S. exports of chicken leg quarters are reported under U.S. Schedule B 0207.14.0010. South Africa classifies these exports in a basket category of bone-in chicken portions, South African tariff classification code 0207.14.90. Cochrane, “South Africa Resumes Imports of U.S. Chicken,” March 6, 2017.

<sup>114</sup> Cochrane, “South Africa Resumes Imports of U.S. Chicken,” March 6, 2017.

<sup>115</sup> Cochrane, “South Africa Resumes Imports of U.S. Chicken,” March 6, 2017.

<sup>116</sup> An ad valorem equivalent converts a specific tariff rate into a percentage-based tariff rate, whereby the tariff is expressed as a percentage of the value of the import.

<sup>117</sup> Cochrane, “South Africa Resumes Imports of U.S. Chicken,” March 6, 2017; ITAC, “Draft Guidelines for the Application of a DAFF Quota,” October 2015, 1; Cochrane, Hansen, and Seeley, *Poultry Production and Trade in the Republic of South Africa*, November 2016, 8; USDA, FAS, *South Africa: The United States Fills the Chicken Meat Quota*, May 29, 2019, 2.

<sup>118</sup> USDA, FAS, *South Africa: The United States Fills the Chicken Meat Quota*, May 29, 2019, 2.

<sup>119</sup> USDA, FAS, *South Africa: The United States Fills the Chicken Meat Quota*, May 29, 2019, 2.

Demand from Ghana, the Republic of the Congo, and The Gambia for frozen chicken cuts is somewhat smaller, since they are smaller economies, but they are still some of the top markets in SSA for U.S. exports of these products.

Infrastructure shortcomings and restrictive government trade policies in SSA inhibit U.S. potential to further increase exports of poultry to SSA. Given that the bulk of U.S. poultry products are shipped frozen, these exports are also constrained by the lack of cold chain infrastructure once they arrive in SSA.<sup>120</sup>

## U.S. Exports of Services to Africa

This section discusses major factors that have led to growth in U.S. exports of certain services—travel, financial, and air transport services—from SSA countries.<sup>121</sup> The factors behind export growth in these sectors include improvements in financial infrastructure and digital technology for financial services; additional direct flights from the United States to SSA for air transport services; and increased enrollment of SSA students in U.S. colleges and universities for travel services. While disaggregated data on U.S. services trade with most SSA countries and with the SSA region as a whole are not available, there are some data on U.S. services exports to Nigeria and South Africa, as well as export data for Africa as a whole.<sup>122</sup>

U.S. exports of private services (which exclude government-provided services) to all African countries increased from \$13.2 billion in 2016 to \$14.8 billion in 2018 (6.0 percent CAGR).<sup>123</sup> U.S. travel services exports to Africa accounted for the largest share (\$4.9 billion or 33.4 percent) in 2018, followed by professional and management services (\$1.6 billion, 11.4 percent) and transportation services (\$1.5 billion, 10.2 percent).<sup>124</sup> The fastest-growing categories of U.S. private services exports in both value and percentage terms during 2016–18 were professional and management services, financial services, air transport, and telecommunications (table 2.11).

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<sup>120</sup> U.S. industry representatives, telephone interview by USITC staff, December 20, 2017.

<sup>121</sup> U.S. exports of financial, air transport, and travel services accounted for 50.7 percent of total U.S. private services exports to Africa in 2018. Exports of professional and management consulting services experienced the fastest growth from 2016 to 2018. However, this is a broad category aggregated from a diverse array of smaller sub-categories, none of which individually grew faster than financial, air transport, or travel services.

<sup>122</sup> BEA publishes data on U.S. cross-border services trade with Africa as a whole, but does not publish data on such trade with the SSA region. BEA data cover SSA as a whole plus North Africa, including Egypt, Libya, Algeria, Morocco, Tunisia, and Western Sahara; and some outlying islands. See USDOC, BEA, “Geographic Area Definitions” (accessed August 8, 2019).

<sup>123</sup> For more information on U.S. trade in services with SSA, please see USITC, “The Sub-Saharan African Services Economy,” 2017.

<sup>124</sup> For 2018 data, BEA suppressed data on technical, trade-related, and other country-specific exports of business services, which came to 13.1 percent of such exports in 2017, to avoid disclosing individual company data.

**Table 2.11** Exports of private services to Africa by service category, 2016–18

Sector	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
			Million \$		%
Professional and management consulting services	1,433	1,556	1,678	245	8.2
Air transport services	1,210	1,303	1,374	164	6.6
Financial services	1,030	1,074	1,191	161	7.5
Travel services <sup>a</sup>	4,848	4,882	4,927	79	0.8
Telecommunications, computer, and information services	612	636	668	56	4.5
Insurance services	112	109	122	10	4.4
Charges for the use of intellectual property n.i.e. <sup>b</sup>	1,131	1,030	971	-160	-7.3
Sea transport services	112	( <sup>c</sup> )	( <sup>d</sup> )	( <sup>d</sup> )	( <sup>d</sup> )
Research and development services	283	374	( <sup>c</sup> )	( <sup>d</sup> )	( <sup>d</sup> )
Technical, trade-related, and other business services	1,709	1,824	( <sup>c</sup> )	( <sup>d</sup> )	( <sup>d</sup> )
<b>Total private services exports</b>	<b>13,150</b>	<b>13,913</b>	<b>14,770</b>	<b>1,620</b>	<b>6.0</b>

Source: USDOC, BEA, International Services Tables, table 2.3 (October 15, 2019).

Note: Due to rounding, figures may not add up to totals shown. N.i.e. = not included elsewhere.

<sup>a</sup> The travel services sector includes travel for all purposes, including personal, business, and education-related travel.

<sup>b</sup> The category charges for the use of intellectual property was formerly called “royalties and license fees” by BEA.

<sup>c</sup> BEA suppresses these country-specific export data to avoid disclosing individual company data.

<sup>d</sup> Absolute change and CAGR are not provided due to suppressed data.

Total sales of services to Africa by U.S.-owned affiliates were \$13.9 billion or 0.9 percent of U.S. affiliate sales of services to all countries in 2017 (the latest year available).<sup>125</sup> The retail trade industry accounted for the largest share (20.6 percent) of U.S. affiliates’ sales of services to Africa in 2017, followed by affiliate sales of finance and insurance services (16.3 percent) and professional, scientific, and technical services (12.5 percent).<sup>126</sup> U.S. affiliate sales of services to South Africa and Nigeria comprised 49.2 percent and 6.6 percent, respectively, of all U.S. affiliate sales in Africa.<sup>127</sup> More information on U.S. foreign direct investment in SSA and the operations of U.S.-owned affiliates in that region can be found in chapter 4 of this report.

As bilateral services trade data for the United States and SSA are limited, the analyses in this section also present World Trade Organization (WTO) data on world exports to SSA countries (table 2.12).<sup>128</sup>

<sup>125</sup> According to BEA, affiliate transactions data reflect “services supplied (to foreign residents) by majority-owned affiliates of (U.S.) multinational enterprises (MNEs) through the channel of direct investment,” which relates these transactions to foreign direct investment stock and flows. This approximately corresponds to the General Agreement on Trade in Services (GATS) category of “trade through commercial presence.” USDOC, BEA, “Definition of International Services,” October 2018; USDOC, BEA, International Services Tables, table 4.4, October 15, 2019.

<sup>126</sup> BEA includes services related to manufacturing and mining in its U.S. affiliate sales data, which accounted for 1.2 percent and 17.0 percent of such sales to Africa in 2017, respectively. USDOC, BEA, International Services tables, table 4.1 (October 15, 2019).

<sup>127</sup> USDOC, BEA, International Services Tables, table 4.4, (October 15, 2019).

<sup>128</sup> The WTO publishes data on commercial services trade for 47 SSA countries. The latest year for which complete data are available is 2015. The WTO publishes limited preliminary data on SSA trade in commercial services for

According to the WTO, commercial services exports from the world to SSA countries decreased at a CAGR of 5.2 percent during 2015–17 from \$111.0 billion to \$99.8 billion.<sup>129</sup> Nigeria received the largest share of such exports (18.0 percent) in 2017, followed by South Africa (15.8 percent).<sup>130</sup> Of the key SSA markets,<sup>131</sup> world exports of commercial services to Ghana experienced the highest growth in value and percent terms (\$2.0 billion and 14.3 percent, respectively) between 2015 and 2017. During that time, technical, trade-related, and other business services was the fastest-growing sector of world commercial services exports to the key SSA markets, particularly to Nigeria (up 100.9 percent) and Ghana (up 21.6 percent).<sup>132</sup>

**Table 2.12** World exports of private services to key SSA markets, 2015–17<sup>a</sup>

Country	2015	2016	2017	Absolute change	Compound annual
				2015–17	growth rate (CAGR)
					2015–17
			Million \$		%
Nigeria	18,816	11,335	17,973	-843	-2.3
South Africa	15,110	14,531	15,762	652	2.1
Ghana	6,489	7,091	8,478	1,989	14.3
Ethiopia	4,835	5,162	4,844	9	0.1
Côte d'Ivoire	2,639	2,755	3,180	541	9.8
Kenya	3,077	2,539	2,847	-230	-3.8
Rwanda	946	976	904	-42	-2.2
All other SSA	59,113	47,360	45,775	-13,338	-12.0
Total SSA <sup>b</sup>	111,025	91,749	99,763	-11,262	-5.2

Source: WTO, Time Series on International Trade, “Trade in Commercial Services, 2005–onward (BOP6)” (accessed August 12, 2019).

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> 2017 is the latest year for which data are available for all key markets. WTO reports these data as individual SSA countries’ commercial services imports from the world. The term “commercial services,” as used in the WTO services trade data, is roughly equivalent to the term “private services” used in BEA services trade data. Furthermore, due to reporting discrepancies, global exports and imports for a country may not reconcile.

<sup>b</sup> This total does not include world exports to the Central African Republic, Chad, Comoros, Equatorial Guinea, or Gabon, as data on world exports to those countries are unavailable for 2015–17.

## Financial Services

Worldwide, the financial services industry enables monetary transactions, mobilizes savings, and allocates capital, thus facilitating business in a broad range of sectors. Typically provided by banks,

2017. This total does not include world exports to countries for which data for 2017 were missing, namely, the Central African Republic, Chad, Comoros, Equatorial Guinea, and Gabon.

<sup>129</sup> WTO, Statistics Database, Time Series on International Trade, “Trade in Commercial Services, 2005–onward (BOP6)” (accessed August 12, 2019).

<sup>130</sup> WTO reports these data as individual SSA countries’ commercial services imports from the world. The term “commercial services,” as used in the WTO services trade data, is roughly equivalent to the term “private services” used in BEA services trade data. Like the BEA cross-border trade data, the WTO cross-border trade data roughly correspond to modes 1, 2, and 4 specified in GATS. WTO, Statistics Database, Time Series on International Trade, “Trade in Commercial Services, 2005–onward (BOP6)” (accessed August 12, 2019).

<sup>131</sup> The key SSA markets within this report are Côte d'Ivoire, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, and South Africa.

<sup>132</sup> WTO, Statistics Database, Time Series on International Trade, “Trade in Commercial Services, 2005–onward (BOP6)” (accessed August 12, 2019).

financial services include credit card, brokerage, underwriting, financial management, advisory and custody, securities lending, and electronic funds transfer services.

## Overview of U.S. Exports

Data published by BEA indicate that U.S. financial services exports to Africa are small, making up only \$1.2 billion or 1.1 percent of total U.S. exports of financial services in 2018. While total U.S. financial services exports grew by 6.3 percent during 2016–18, U.S. financial services exports to Africa grew at a higher rate—7.5 percent—rising by \$161 million between 2016 and 2018 (table 2.13). However, these figures have mostly stagnated since 2012, when the U.S. exported \$1.1 billion and imported \$398 million in cross-border financial services with Africa. By 2018, South Africa accounted for 32.9 percent (\$392 million) of these exports, while Nigeria accounted for 8.5 percent (\$101 million).<sup>133</sup>

**Table 2.13** Financial services: U.S. exports to Africa and selected SSA countries, 2016–18

Country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
		Million \$			%
Africa	1,030	1,074	1,191	161	7.5
Nigeria	148	97	101	-47	-17.4
South Africa	333	359	392	59	8.5
All other Africa	549	618	698	149	12.8

Source: USDOC, BEA, International Services tables, table 2.2 (October 15, 2019).

Note: Due to rounding, figures may not add up to totals shown.

Moreover, BEA reported that 1.0 percent of sales by foreign affiliates of U.S. finance firms occurred in Africa in 2017.<sup>134</sup> Sales by foreign affiliates of U.S. finance firms in Africa totaled \$1.9 billion in 2017, growing by 14.9 percent since 2015.<sup>135</sup> Data on financial services sales are not available for individual African countries, and data on U.S. affiliate sales of depository credit intermediation (banking) and other financial services to Africa are suppressed for 2015 and 2016 in order to avoid disclosure of individual company information. However, BEA data show that U.S. affiliates sold \$734 million of depository credit intermediation services in Africa in 2017, comprising 39.4 percent of financial services sold in Africa.<sup>136</sup> Furthermore, though data on U.S. affiliate sales of finance and insurance services in Nigeria are suppressed for this period, the United States' combined affiliate sales in Africa of both financial and insurance services indicate that South Africa accounted for \$600 million or 26.6 percent of such sales in 2017.

<sup>133</sup> USDOC, BEA, International Services tables, table 2.2 (October 15, 2019).

<sup>134</sup> The year 2017 is the latest year for which such data are available. USDOC, BEA, International Services Tables, table 4.1, "Services Supplied to Foreign Persons by U.S. MNEs through Their MOFAs, by Industry of Affiliate and by Country of Affiliate" (October 15, 2019).

<sup>135</sup> Affiliate transactions and cross-border exports are not directly comparable, as they are calculated differently. However, in general, U.S. affiliate sales of financial and insurance services to SSA are significantly larger than U.S. exports of these services.

<sup>136</sup> USDOC, BEA, International Services Tables, table 4.4, "Table 4.4. Services Supplied to Foreign Persons by U.S. MNEs through Their MOFAs, by Country of Affiliate and by Industry of Affiliate" (October 15, 2019).

## Key Factors Affecting U.S. Financial Services Exports to SSA, 2016–18

### Financial Infrastructure

Recent gains in “financial inclusion” of individuals and enterprises in certain SSA countries are facilitating U.S. firms’ participation in SSA’s growing financial services markets.<sup>137</sup> Although widely noted as underdeveloped, and with large variations in maturity across countries, SSA’s financial infrastructure has improved in recent years. The number of people over the age of 15 with accounts at financial institutions or with providers of mobile money services grew by 8.4 percentage points during 2014–17. The largest gains were in Burkina Faso, Togo, Senegal, Gabon, Zimbabwe, Cameroon, Benin, and Namibia, which all posted increases of over 20 percentage points during this period. Domestic credit provided by the financial sector also grew as a share of GDP, from an average of 33.2 percent in 2014 to an average of 39.6 percent in 2018 in SSA as a whole. The Republic of the Congo, Zimbabwe, Equatorial Guinea, and Lesotho posted increases of over 15 percent for this measure during the period.<sup>138</sup>

The relative infancy of the SSA financial system also offers opportunities for global banks seeking higher returns as growth slows in these banks’ home markets (returns in Africa in the sector were almost double the global average in 2018).<sup>139</sup> One industry representative notes the recent “incredible growth in mobile phones” as an opportunity for banks and insurers to reach new populations in both rural and urban areas.<sup>140</sup> In response to pledged economic reforms in target nations, large banks such as U.S.-based Goldman Sachs and Citigroup have partnered with foreign equity firms and large regional banks in countries such as South Africa and Nigeria to expand operations in Africa.<sup>141</sup>

### Digital Technology

U.S. firms are increasingly using innovative digital solutions to overcome financial infrastructure constraints, allowing them to be more active in SSA financial services markets and driving U.S. exports of financial services. These new technologies—many of which leverage the region’s increasing mobile phone penetration—include advanced payment solutions and digital financial assistants, among others. For example, Kenyan officials attribute increased access to financial services in the country over the last

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<sup>137</sup> According to the United Nations (UN), financial inclusion means that “means that individuals and enterprises can access and use a range of appropriate and responsibly provided financial services offered in a well-regulated environment.” The UN features financial inclusion as a target in 8 of the 17 sustainable development goals. UNCDF, “Financial Inclusion” (accessed January 21, 2020); UNCDF, “Financial Inclusion and the SDGs” (accessed January 21, 2020).

<sup>138</sup> World Bank, World Development Indicators, “Account Ownership at a Financial Institution or with a Mobile-Money-service Provider (% of Population Ages 15+),” October 28, 2019; World Bank, World Development Indicators database, “Domestic Credit Provided by Financial Sector (% of GDP),” October 28, 2019.

<sup>139</sup> Chironga et al., “African Retail Banking’s Next Growth Frontier,” February 2018.

<sup>140</sup> USITC, hearing transcript, July 24, 2019, 163 (testimony of Stephen Simchak, American Property Casualty Insurance Association).

<sup>141</sup> Cotterill, “Goldman Sachs Plots South Africa Banking Expansion,” May 5, 2019; Arnold, “Citigroup Targets Rapid Middle East, Africa Growth,” February 7, 2018.

13 years to M-Pesa, the mobile money platform operated by telecom firm Safaricom.<sup>142</sup> U.S.-based Mastercard offers a myriad of tools in Africa to address challenges to electronic payments. For example, Masterpass QR for Facebook Messenger allows small businesses to establish digital money accounts and accept mobile payments using QR code technology.<sup>143</sup> By creating auditable transaction records, Masterpass QR also increases access to other financial services, such as loans, by providing unbanked customers with a financial history. Launched in Nigeria, the initiative has drawn support from local banks; together with Ecobank, the leading pan-African bank, Mastercard plans to serve 100 million Africans using this technology by the end of 2020.<sup>144</sup> For a more detailed discussion of financial technology in SSA, see case study 7.2 in chapter 7.

Digital currencies are likely to see high adoption rates in SSA due to the lack of financial infrastructure in the region. In SSA, digital currencies may be seen by firms and individuals as a solution to national currency fluctuations, regulatory barriers, and higher-cost alternatives.<sup>145</sup> Many residents of SSA countries are already adopting cryptocurrencies, a type of digital currency. Facing hyperinflation, residents of Zimbabwe use bitcoin priced at a premium compared to world prices to settle local transactions, even though bitcoin has been illegal in Zimbabwe since 2018.<sup>146</sup> Botswana, Ghana, Kenya, Nigeria, and South Africa represent the other main bitcoin economies in SSA; all but Botswana experienced over 5 percent inflation in 2016 and 2017.<sup>147</sup>

### Political and Regulatory Environment

Several SSA countries have opened their financial sectors to foreign firms in recent years, permitting more U.S. involvement in the region.<sup>148</sup> As a result, an increasing number of large U.S. banks are seeking banking licenses or establishing subsidiaries throughout SSA, such as JPMorgan Chase in Ghana and Kenya.<sup>149</sup> Further, the African Continental Free Trade Area (AfCFTA) explicitly aims to unify standards and improve oversight in African financial services markets, which may encourage further involvement by U.S. firms.<sup>150</sup> The agreement includes basic commitments on financial services as well as on

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<sup>142</sup> Forden, “Mobile Money in Kenya,” June 2015; Agade, “Africa Urged to Leverage on Digital Technologies,” July 16, 2019.

<sup>143</sup> Quick Response (QR) codes are two-dimensional bar codes that encode information. Customers scan the printed code with their mobile device to pay. Mastercard, “Masterpass QR: Collect E-payment without POS Terminal” (accessed November 13, 2019); Mobile Payments Today, “MasterCard Launches Masterpass QR Facebook Bot,” March 5, 2018.

<sup>144</sup> Monehin, “Is Africa’s Financial Industry Ripe for Digital Disruption?” May 4, 2017; Sow, “Africa in the News: JP Morgan Chase Plans,” January 26, 2018; Mastercard, “Mastercard Uses Facebook Messenger to Help,” February 28, 2018; Mastercard, “Mastercard Acquires Oltio to Accelerate Digital Payments Adoption,” March 6, 2018.

<sup>145</sup> AP, “Will Facebook’s Libra Become the Go-To Payment System?” June 28, 2019.

<sup>146</sup> Karombo, “Zimbabwe Banned the US Dollar,” July 10, 2019; Karombo, “Regulators Have Blown Up Bitcoin Trade,” May 15, 2018.

<sup>147</sup> Rao, “Africa Could Be the Next Frontier for Cryptocurrency,” April–July 2018; IMF, “Inflation Rate, Average Consumer Prices,” in *World Economic Outlook*, October 2019.

<sup>148</sup> Wilson, “Ethiopia Takes First Step towards Liberalizing Finance Sector,” August 8, 2019.

<sup>149</sup> White, “JPMorgan Plans Expansion into Ghana and Kenya,” January 24, 2018.

<sup>150</sup> UNCTAD, “African Continental Free Trade Area: Policy,” 2016; African Union, Agreement Establishing the African Continental Free Trade Area (accessed August 12, 2019). For a more detailed discussion the AfCFTA, see chapter 8.

transportation, communication, tourism, and business services, which one industry representative noted are sectors in which many U.S. firms face restrictions.<sup>151</sup> While risks from political and economic instability remain, recent commitments to economic reform suggest future opportunities.<sup>152</sup>

## Air Transport Services

Air transport services include passenger transport, freight transport, and airport services. U.S. passenger transport services exports occur whenever U.S. airlines transport foreign residents to and from the United States or between two foreign countries. U.S. exports of air freight services occur when U.S. carriers transport foreign goods between the United States and foreign countries or between two foreign ports. Finally, U.S. exports of airport services encompass the value of goods and services—such as aircraft handling and terminal services, among others—procured by foreign airlines at U.S. airports.<sup>153</sup>

### Overview of U.S. Exports

In 2018, U.S. exports of air transport services to South Africa accounted for \$426 million, up from \$377 million in 2016 (table 2.14).<sup>154</sup> South Africa and Nigeria, the only two SSA countries for which BEA provides discrete data on U.S. cross-border services trade, respectively accounted for 31.0 percent and 23.6 percent of U.S. exports of air transport services to Africa in 2018. Between 2016 and 2018, U.S. exports of air transport services to Africa grew at a CAGR of 6.6 percent, which is tracked closely by the growth in U.S. exports of air transport services to South Africa. Passenger services accounted for the majority of such exports (71.5 percent, or \$982 million) in 2018, followed by freight services (17.8 percent) and airport services (10.7 percent) (figure 2.1).

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<sup>151</sup> USITC, hearing transcript, July 24, 2019, 210 (testimony of Stephen Simchak, American Property Casualty Insurance Association), 243 (Stephen Lande, Manchester Trade Limited, Inc.).

<sup>152</sup> Munshi, “Nigeria’s President Unveils New Cabinet,” August 21, 2019; Cotteril, “Zimbabwe Strikes Milestone IMF Deal,” May 31, 2019; Henderson, “JPMorgan Hiring in Africa,” July 17, 2019; Sow, “Africa in the News: JP Morgan Chase Plans Africa Expansion,” January 26, 2018; USITC, hearing transcript, July 24, 2019, 210 (testimony of Stephen Simchak, American Property Casualty Insurance Association), 363 (Laird Treiber, Corporate Council on Africa).

<sup>153</sup> USDOC, BEA, *U.S. International Economic Accounts: Concepts and Methods*, September 2014.

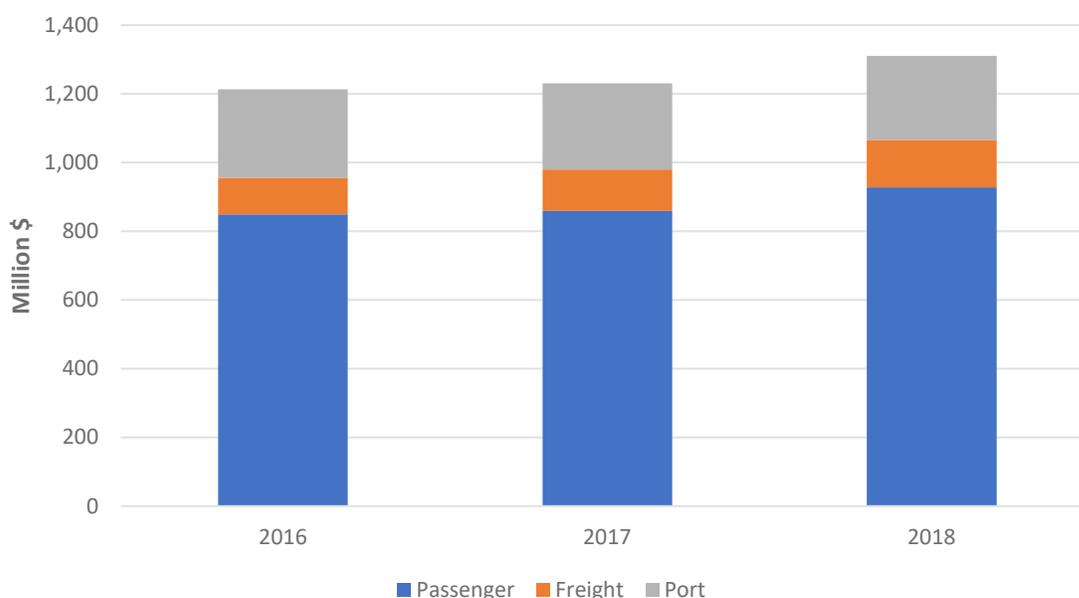
<sup>154</sup> USDOC, BEA, *International Services Tables*, table 2.2 (accessed August 8, 2019).

**Table 2.14** U.S. exports of air transport services to Africa and to selected SSA countries

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
	Million \$				%
Africa	1,210	1,303	1,374	164	6.6
Nigeria	312	323	325	13	2.1
South Africa	377	427	426	49	6.3
All other Africa	521	553	623	102	9.4

Source: USDOC, BEA, International Services Tables, table 2.2 (accessed August 8, 2019).

**Figure 2.1** Air transport services: U.S. exports to Africa 2016–18, by category



Source: USDOC, BEA, International Services Tables, table 2.2 (accessed August 8, 2019).

Notes: Due to rounding, figures may not add up to totals shown. See appendix table I.1 for a tabular presentation of the data in this figure.

While the value of air transport services increased, data from the Bureau of Transportation Statistics (BTS) of the U.S. Department of Transportation on the number of passengers traveling on U.S. air carriers to five SSA countries—Angola, Ghana, Nigeria, Senegal, and South Africa—decreased. These data indicate that the number of passengers traveling on U.S. carriers to these SSA countries decreased by less than 1.2 percent during 2016–18, from 224,121 to 218,940. Overall, travel to these destination countries accounted for only 0.2 percent of total passengers transported abroad by U.S. airlines in 2018. Among these countries, South Africa is the leading destination for passengers on U.S. airlines traveling to the region, with 92,050 passengers (or 42.0 percent of the total) in 2018 (table 2.15).<sup>155</sup>

<sup>155</sup> USDOT, BTS, “T-100 International Market (U.S. Carriers Only) Report” (accessed August 23, 2019).

**Table 2.15** Number of international passengers to selected SSA countries transported by U.S. carriers, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
Passengers, 1,000s					%
South Africa	92	92	92	0.5	0.3
Nigeria	69	48	66	-2	-1.8
Ghana	39	40	42	3	3.8
Senegal	15	17	17	2	5.6
Angola	9	6	1	-8	-62.1

Source: USDOT, BTS, “T-100 International Market (U.S. Carriers Only) Report” (accessed August 23, 2019).

Note: Because data are available for only certain SSA countries, data for total SSA or Africa regions are unavailable.

The SSA market constitutes a very small and declining share of total U.S. air freight volumes. In 2018, SSA accounted for only 3,191 tons of total U.S. air freight exports, down from 5,309 tons in 2016. In both years, U.S. exports to SSA accounted for only 0.1 percent of total U.S. air freight volume exported to the world. Among the countries for which discrete data are available, South Africa was the leading SSA destination for air freight transported by U.S. carriers in 2018 with 2,239 tons, followed by Angola with 327 tons (table 2.16). Following the worldwide trend, the volume of freight transported to both of these countries by U.S. carriers decreased overall during 2016–18.<sup>156</sup>

**Table 2.16** Freight volume transported by U.S. carriers to selected SSA countries, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual growth
				2016–18	rate (CAGR) (2016–18)
Metric tons					%
South Africa	2,443	2601	2,239	-204	-4.3
Angola	1,894	1,309	327	-1,567	-58.4
Nigeria	305	221	237	-68	-11.9
Niger	53	34	51	-2	-1.6
Ghana	22	10	39	17	31.1
Kenya	99	4	2	-97	-85.2

Source: USDOT, BTS, Air Cargo, “T-100 International Market (U.S. Carriers Only) Report” (accessed August 23, 2019).

Note: Converted to metric tons. Because data are available for only few SSA countries, data for total SSA or Africa regions are unavailable.

## Key Factors Affecting U.S. Exports of Air Transport Services, 2016–18

Low U.S. exports of air passenger transport services to SSA are a product of the small number of SSA routes offered by U.S. airlines in 2017 and 2018. Delta Airlines was the only U.S. carrier providing direct passenger flights to SSA, offering flights to Accra, Dakar, Lagos, and Johannesburg. United Airlines discontinued its few remaining routes to the region in 2016. However, it reopened its nonstop route from Newark Liberty Airport to Cape Town, in December 2019, and is now the only U.S. carrier offering a direct route to that South African city.<sup>157</sup>

<sup>156</sup> USDOT, BTS, “T-100 International Market (U.S. Carriers Only) Report” (accessed August 23, 2019).

<sup>157</sup> Fox, “You Can Now Fly Nonstop from the U.S.,” December 17, 2019.

U.S. air passenger exports to SSA are expected to grow due to Delta's addition of three weekly flights to Lagos, Nigeria, in 2018, after a three-year pause in service.<sup>158</sup> This route has historically been an important one for Delta, which was the largest U.S.-based airline to serve Lagos until 2015. Also, in addition to its new route to Cape Town, United Airlines is planning to open a route that will serve Cabo Verde, becoming the only U.S. carrier to do so. Nonetheless, despite planned expansion, U.S. carriers find it difficult to compete in SSA, as the market is served principally by foreign carriers that fly from international hubs in Europe and the Middle East.<sup>159</sup>

While the volume of U.S. air freight transported to several SSA countries declined during 2016–18, the value of U.S. air freight exports to Africa as a whole increased from 2016 to 2018,<sup>160</sup> growing from \$203 million in 2016 to \$245 million in 2018 (9.9 percent CAGR).<sup>161</sup> Growth in the value of U.S. exports of air freight transport services also occurred in countries such as South Africa and Nigeria. However, these countries experienced a fall in freight volumes transported by U.S. carriers, which could indicate that the value of goods transported by air has increased over the period. Additionally, Kenya and the United States signed an amendment to the 2008 U.S.-Kenya Air Transport Agreement in February 2020, which sources suggest could decrease costs for carriers and increase transport efficiency between the two countries.<sup>162</sup>

## Travel Services

### Overview of U.S. Exports

Data on trade in travel services reflects goods and services, such as food and lodging, purchased while traveling abroad for personal, business, health, or education purposes. More specifically, U.S. exports of travel services are goods and services purchased by foreign nationals while traveling in the United States.<sup>163</sup> In 2018, U.S. exports of travel services exceeded \$214 billion, of which exports to Africa comprised \$4.9 billion (or about 2 percent) (table 2.17).<sup>164</sup> Nigeria and South Africa, the only two SSA countries for which BEA provides discrete data on U.S. cross-border services trade, respectively accounted for 26.9 percent and 15.0 percent of U.S. exports of travel services to Africa in 2018.

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<sup>158</sup> Delta Air Lines, "More Access to Africa on Delta," August 20, 2017; Mikairu, "Delta Launches Nonstop Flight from Lagos," April 10, 2018.

<sup>159</sup> Dahir, "International Carriers Still Dominate," August 27, 2019.

<sup>160</sup> USDOT, BTS, "T-100 International Market (U.S. Carriers Only) Report" (accessed August 23, 2019).

<sup>161</sup> USDOC, BEA, International Services Tables, table 2.2 (accessed August 8, 2019).

<sup>162</sup> The amendment allows U.S. airlines carrying only cargo to fly from Kenya to a third country without needing to stop in the United States. Olingo, "Kenya, US Sign Amended Air Cargo Agreement," February 6, 2020; Vidija, "US, Kenya Add All Cargo Rights to Air Transport Agreement," February 6, 2020.

<sup>163</sup> USDOC, BEA, *U.S. International Economic Accounts: Concepts and Methods*, September 2014.

<sup>164</sup> USDOC, BEA, International Services Tables, table 2.2 (accessed August 8, 2019).

**Table 2.17** U.S. exports of travel services

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
	Million \$				%
Africa	4,848	4,882	4,927	79	0.8
South Africa	670	705	739	69	5.1
Nigeria	1,327	1,362	1,326	-2	0.0
All other Africa	2,851	2,815	2,862	11	0.2

Source: USDOC, BEA, International Services Tables, table 2.2 (accessed August 8, 2019).

Note: Due to rounding, figures may not add up to totals shown.

A large portion of U.S. travel exports to SSA involves education-related travel. Nigeria was the 13th-largest source of international students coming to the United States, and the only SSA country that places in the top 25 countries. It accounted for 12,693 students, or 1.2 percent of total foreign students in the United States in the 2017/2018 academic year. According to the Institute of International Education, SSA as a whole sent a record number of students to the United States in 2017/2018, with 39,479 students studying in the United States, or 3.6 percent of the global total. This is a 4.6 percent absolute increase from the previous academic year.<sup>165</sup>

Data on U.S. visa issuances provide further information about U.S. travel services exports. The U.S. Department of State’s Bureau of Consular affairs estimated that between 2016 and 2018, more than 1.3 million total non-immigrant visas were issued to residents of SSA countries, peaking in 2017 at 515,434 visas. Of these, B-1/2 visas (short-term business and tourist visas) accounted for the largest share of issuances at 80.9 percent in 2018, followed by F-1 visas (academic student visas) at 4.4 percent.<sup>166</sup> Nigeria and South Africa accounted for the largest shares of total U.S. non-immigrant visa issuances to nationals of SSA countries in 2018, at 35.6 percent and 17.1 percent, respectively.

## Key Factors Affecting U.S. Exports of Travel Services, 2016–18

In recent years, education-related travel has driven overall growth in U.S. travel services exports to SSA. The United States attracts students from SSA due to its well-known educational institutions;<sup>167</sup> English language instruction; and the possibility of finding work in the United States. Degrees from U.S. universities are seen as providing an edge in competitive local job markets.<sup>168</sup> While exact data on SSA enrollment by type of program are unavailable, bachelor’s and master’s degree programs account for the second- and third-largest segments of the overall U.S. market for international students in higher education.<sup>169</sup>

<sup>165</sup> Data on international students studying in the United States, including students from SSA countries, is published by the Institute of International Education. Institute of International Education, “International Students by Place of Origin, 2016/2017 and 2017/2018” (accessed November 14, 2019); Institute of International Education, “International Students by Place of Origin, 2015/16 & 2016/17,” 2017 (accessed February 5, 2020).

<sup>166</sup> USDOC, Bureau of Consular Affairs, Visa Statistics 2016, 2017, 2018 (accessed August 26, 2019).

<sup>167</sup> *Times Higher Education*, “World University Rankings 2017” (accessed September 30, 2019).

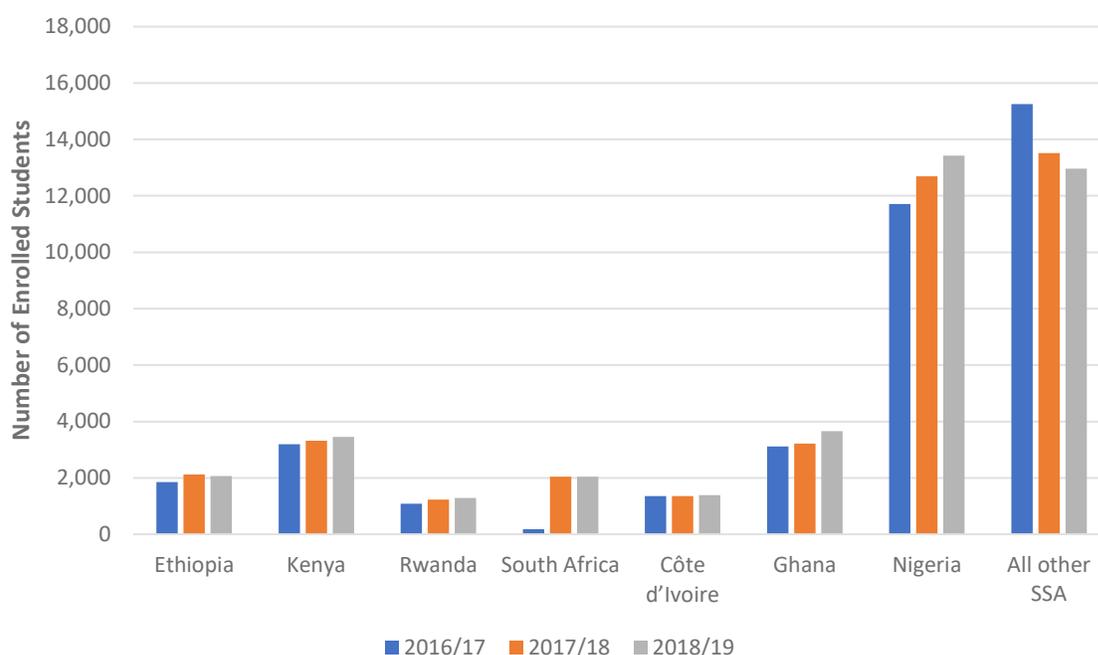
<sup>168</sup> Kazeem, “Only One in Four Nigerians Applying,” February 22, 2017.

<sup>169</sup> *Times Higher Education*, “World University Rankings 2017” (accessed September 30, 2019).

Enrollments of SSA students at U.S. educational institutions grew from 35,364 students in academic year 2016/2017 to 40,290 students in academic year 2018/2019 (6.7 percent CAGR).<sup>170</sup> This growth is possibly due in part to promotional efforts, such as a government-led education trade mission to the region in 2016 that included representatives from 25 U.S. colleges and universities.<sup>171</sup>

Among SSA countries, Nigeria is the largest source of international students from SSA, accounting for 13,423 students in 2018/19, or 33.3 percent, with the number of students from Nigeria increasing steadily in the three academic periods. The increase in student enrollment may be driven by local pressures, such as underfunding of higher education centers, a large student population, and the competitiveness of the local labor markets.<sup>172</sup>

**Figure 2.2** Number of enrolled students from selected SSA countries by academic year, 2016–19



Source: Institute of International Education, “International Students by Place of Origin, 2016/2017 and 2017/2018” (accessed November 14, 2019); Institute of International Education, “International Students by Place of Origin, 2015/16 and 2016/17,” 2017 (accessed February 5, 2020).

Note: Due to rounding, figures may not add up to totals shown. See appendix table I.2 for a tabular presentation of the data in this figure.

<sup>170</sup> Institute of International Education, “International Students by Place of Origin, 2016/2017 and 2017/2018” (accessed November 14, 2019); Institute of International Education, “International Students by Place of Origin, 2015/16 and 2016/17,” 2017 (accessed February 5, 2020).

<sup>171</sup> USDOC, ITA, “Commerce Official to Lead Department’s First Ever Education Trade Mission to Africa,” March 2, 2016.

<sup>172</sup> Kazeem, “Nigerians Are Spending Half A Billion Dollars,” November 25, 2019

# Chapter 3

## U.S. Imports of Goods and Services from SSA

### Introduction

This chapter gives an overview of U.S. imports of goods and services from SSA countries for the period 2016–18. It identifies the sectors and SSA countries from which U.S. imports of goods and services have increased the most by absolute value and examines the key factors behind their growth.

In the first part of the chapter, U.S. general import data for goods are presented at both the sector and country levels, offering a broad overview of sectors and countries where the most growth accrued in absolute value terms.<sup>173</sup> This part includes a summary of the top six source markets and top six leading growth sectors that account for substantial shares of U.S. imports of goods from SSA.<sup>174</sup> A separate section provides an overview of the top four sectors<sup>175</sup> in which goods were imported to the United States under the African Growth and Opportunity Act (AGOA), which includes goods imported under the U.S. Generalized System of Preferences program (GSP).<sup>176</sup> Next, sector profiles examine U.S. goods imports from SSA that have increased the most during 2016–18 and describe the key factors behind this growth.

The second part of the chapter identifies and discusses factors that have led to growth in U.S. imports of certain service sectors—specifically travel, financial, and air transport services—from SSA countries. These sectors were chosen for analysis because they are distinct industries that account for substantial shares of U.S. cross-border services imports from Africa, and because U.S. imports of these services have increased during the period.<sup>177</sup>

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<sup>173</sup> Sectors that showed most growth in percentage change terms are profiled in appendix G.

<sup>174</sup> Selected sectors and countries are responsible for over 90 percent of total change in absolute value of imports from SSA in 2016–18.

<sup>175</sup> Six sectors were initially selected for profiling. Two of these sectors—crude petroleum and ferroalloys—were the leading growth sectors in imports from SSA, both in general and under AGOA. These two sectors are profiled in the first section of this chapter and are not included in the section describing imports from SSA under AGOA.

<sup>176</sup> AGOA expands on the GSP program by offering duty-free access to the U.S. market for all GSP-eligible products from designated SSA countries and for other qualifying products beyond those eligible under the GSP program. Therefore, data on U.S. imports under AGOA presented in this chapter also cover U.S. imports that entered under the GSP program.

<sup>177</sup> Disaggregated data on U.S. services imports from SSA overall, and on services imports from the vast majority of individual SSA countries, are unavailable.

## Key Findings

The value of U.S. imports from SSA countries in 2016–18 rose by \$5 billion, for a compound annual growth rate (CAGR)<sup>178</sup> of 11.5 percent. The majority of this increase was accounted for by crude petroleum from Nigeria and precious metals and diamonds from South Africa. The value of U.S. imports entered under the AGOA trade preference program also rose during this period. Crude petroleum from Nigeria was the main driver behind the \$2 billion (7.6 percent CAGR) increase in total U.S. imports, accounting for 73.5 percent of the overall growth in U.S. imports under AGOA. The main reason for the increase in the value of U.S. imports of crude petroleum from Nigeria during 2016–18 was the increase in the price of crude petroleum; the volume of U.S. imports of these products from Nigeria actually fell during the period, particularly in 2018.

In examining the reasons behind the growth in U.S. goods imports from SSA, several factors were found to be important across multiple sectors.<sup>179</sup> These factors include AGOA eligibility, the presence of foreign direct investment (FDI) in the sector, increased consumer demand from the United States, expanded production capabilities, and cost advantages in production. In some sectors, a particular factor was dominant. For example, foreign-domestic partnerships were particularly important in mining sectors in Botswana and South Africa. AGOA eligibility was important in affecting relative production cost advantages in manufacturing and mining. However, in the majority of sectors, the increases in U.S. imports were due to a combination of factors, as well as to some sector-specific conditions, as described below.

U.S. imports of private services from all African countries also increased overall during 2016–18. Especially notable were gains in financial, travel, and air transport services—prominent services segments that represented roughly two-thirds of U.S. imports of private services from all of Africa in 2018. U.S. imports of private services from all African countries increased at a CAGR of 11.4 percent during 2016–18, from \$8 billion to \$10 billion.<sup>180</sup>

The gains in financial, travel, and air transport services reflected several positive trends in SSA. Both investment activity and the increasing maturity of SSA financial markets contributed to increased U.S. demand for financial services from local SSA institutions during the period. The travel services sector accounted for the largest share (48.4 percent) of U.S. private services imports from Africa in 2017.<sup>181</sup> Recent improvements and refinements to tourism marketing campaigns that promoted the region’s natural and cultural attractions to potential foreign visitors were key factors in the increase in U.S. imports of travel services from SSA. This increase in U.S. travel services imports from SSA also contributed to the recent increase in air transport services. In these three services segments, U.S.

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<sup>178</sup> Unless otherwise specified, growth is expressed in CAGR.

<sup>179</sup> Countries included in tables for the fastest-growing U.S. imports in this chapter represent sources which are either the largest or have been historically large sources of U.S. imports from SSA.

<sup>180</sup> The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce does not publish data on U.S. cross-border services trade with SSA, only Africa as a whole. Africa includes SSA as well as Egypt, Libya, Algeria, Morocco, Tunisia, Western Sahara, and outlying islands. See USDOC, BEA, “Geographic Area Definitions,” n.d. [https://apps.bea.gov/international/bp\\_web/geographic\\_area\\_definitions.pdf](https://apps.bea.gov/international/bp_web/geographic_area_definitions.pdf) (accessed August 8, 2019).

<sup>181</sup> USDOC, BEA, International Services Tables, table 2.3 (October 19, 2018).

imports from SSA will likely continue to grow due to increased economic development in SSA, improved financial and traditional infrastructure, and the addition of air passenger flights between the regions.

## U.S. Imports of Goods from SSA Countries

### Fastest-growing U.S. Imports from SSA Countries

During 2016–18, the total value of U.S. goods imports from SSA increased by \$5 billion (11.5 percent CAGR). The largest growth was seen in the crude petroleum sector, where imports increased by 12.9 percent from \$7 billion in 2016 to \$9 billion in 2018.<sup>182</sup> This growth in imports was due to an increase in value, given that crude petroleum prices rose over the period. Other U.S. imports from SSA also rose in value, though the majority of increases were in a relatively small number of product groups (table 3.1)—largely metals and gemstones.<sup>183</sup>

**Table 3.1** Fastest-growing U.S. general imports from SSA countries, by leading growth product, 2016–18

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
	Million \$				%
Total from SSA	20,160	24,857	25,075	4,915	11.5
Crude petroleum <sup>a</sup>	7,258	10,160	9,252	1,994	12.9
Precious metals and non- numismatic coins	1,501	2,086	2,443	941	27.6
Natural and synthetic gemstones	1,482	1,856	2,273	792	23.9
Spices	242	436	542	300	49.7
Ferroalloys <sup>a</sup>	346	680	597	251	31.3
Certain ores, concentrates, ash, and residues	484	597	717	232	21.7
All other products	8,847	9,042	9,252	405	2.3

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016. [https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/tradeshifts/2015/d3/digest\\_hts8\\_dir\\_final.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/tradeshifts/2015/d3/digest_hts8_dir_final.pdf).

<sup>a</sup> Most, but not all, imports of crude petroleum and ferroalloys from SSA entered under the African Growth and Opportunity Act (AGOA). Totals in this table represent all imports from SSA.

This chapter profiles six leading growth sectors of U.S. imports of goods from SSA by absolute value (table 3.1).

<sup>182</sup> USITC DataWeb/USDOC, Harmonized Tariff Schedule of the United States (HTS) digest EP005 (accessed July 2, 2019).

<sup>183</sup> Sectors shown in table 3.1 and discussed in this chapter are based on USITC digest sectors (see note to table 3.1). For details about each digest sector, see the product-specific sections of this chapter.

## Top Growth Markets for U.S. Imports from SSA

During 2016–18, South Africa and Nigeria were the two SSA countries from which U.S. imports of goods increased the most in absolute value terms (table 3.2).

**Table 3.2** U.S. general imports from SSA countries, by leading source markets, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
	Million \$				2016–18
					%
Total from SSA	20,160	24,857	25,075	4,195	11.5
South Africa	6,784	7,735	8,468	1,683	11.7
Nigeria	4,172	7,050	5,617	1,444	16.0
Madagascar	846	743	892	446	4.2
Equatorial Guinea	193	356	580	387	73.2
Republic of the Congo	132	128	433	301	81.0
Ghana	321	750	581	260	34.5
All other SSA	8,112	8,065	8,506	394	4.9

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

The increase in the value of U.S. imports from South Africa was driven primarily by imports of precious metals and non-numismatic coins, as well as natural and synthetic gemstones. Imports of precious metals and non-numismatic coins increased by \$941 million in 2016–18; imports of natural and synthetic gemstones increased by \$792 million during the same period. The main reasons behind the growth in the value of imports of precious metals and non-numismatic coins were (1) domestic industry restructuring in South Africa that increased the efficiency and production capacity of South African metal refineries, and (2) stable growth in demand from the U.S. downstream consuming industries. Growth in value of imports of natural and synthetic gemstones was driven by an increase in demand for diamonds in the United States, the largest consumption market for diamonds in the world.<sup>184</sup>

The growth of U.S. imports from Nigeria was driven by an increase in the value of imports of crude petroleum and fertilizers, which rose by \$1,347 million and \$36 million, respectively, in 2016–18. As noted above, U.S. imports of petroleum products increased in value, but declined in terms of volume. This was largely due to an increase in world prices for crude petroleum.<sup>185</sup>

Other countries from which U.S. imports of goods increased by relatively large amounts were Madagascar, Equatorial Guinea, the Republic of the Congo, and Ghana. Imports from these countries were in multiple product groups, but no product stood out as single largest factor in the increase in imports from any of those source countries. Table 3.3 presents two leading growth products, in terms of absolute value change, for each country.

<sup>184</sup> De Beers, *The Diamond Insight Report 2018*, September 13, 2018, 5.

<sup>185</sup> For detailed discussion of increases in world price of crude petroleum, see the section profiling imports of crude petroleum in this chapter.

**Table 3.3** Top growth products, by leading source markets, 2016–18

Source country	Leading growth products
South Africa	Precious metals and non-numismatic coins Natural and synthetic gemstones
Nigeria	Crude petroleum Fertilizers
Madagascar	Spices Apparel
Equatorial Guinea	Certain organic chemicals Crude petroleum
Republic of the Congo	Crude petroleum Petroleum products
Ghana	Crude petroleum Natural rubber

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Leading growth products are defined at the digest sector level.

## U.S. Imports of Goods under AGOA

The AGOA program offers trade preferences to designated SSA countries, improving the competitiveness of designated SSA suppliers relative to third countries.<sup>186</sup> Data on imports under AGOA inform the selection of sectors profiled in this chapter. U.S. imports from SSA under AGOA increased in terms of both dollar value and percentage change. Sectors that grew most by value were certain petroleum products, miscellaneous inorganic chemicals, ferroalloys, apparel, and edible nuts (table 3.4).<sup>187</sup> Table 3.5 lists the leading source markets for U.S. imports for consumption under AGOA.

Growth in the value of U.S. imports from SSA of crude petroleum and petroleum products was primarily driven by an increase in prices. The increase in imports of ferroalloys was primarily due to higher demand for this product group by U.S. steel producers. By contrast, the increase in imports of apparel from SSA was driven by supply factors.

<sup>186</sup> For a detailed overview of the AGOA program, see USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018, and USITC, *The Year in Trade 2018*, October 2019. The GSP program also offers many SSA countries trade preferences on eligible products. As described in the sector profiles below, some SSA exporters may choose to use preferences under GSP rather than AGOA for certain products.

<sup>187</sup> Crude petroleum and ferroalloys were the two leading growth sectors in imports from SSA under AGOA and two of the leading growth sectors in imports from SSA in general. These two sectors are profiled in the first section of this chapter and are not included in the section describing imports from SSA under AGOA.

**Table 3.4** U.S. imports for consumption under AGOA, by leading growth product, in terms of absolute change 2016–18

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
		Million \$			%
Total	10,444	13,650	12,100	1,657	7.6
Crude petroleum <sup>a</sup>	5,912	8,879	7,654	1,742	13.8
Ferroalloys <sup>a</sup>	335	646	586	252	32.3
Apparel	1,010	1,033	1,218	209	9.9
Miscellaneous inorganic chemicals	109	113	204	95	36.8
Petroleum products	239	353	320	81	15.6
Edible nuts	99	125	163	64	28.2
All other products	2,740	2,501	1,954	-786	-15.5

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of related 8-digit subheadings in the Harmonized Tariff Schedule of the United States (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” Shifts in U.S. Merchandise Trade 2015, September 2016, [https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/tradeshifts/2015/d3/digest\\_hts8\\_dir\\_final.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/tradeshifts/2015/d3/digest_hts8_dir_final.pdf).

<sup>a</sup> Most imports of crude petroleum and ferroalloys from SSA entered under the African Growth and Opportunity Act (AGOA), but not all. Totals in this table represent imports under AGOA.

**Table 3.5** U.S. imports for consumption under the African Growth and Opportunity Act (AGOA), by leading source market, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
		Million \$			%
Total SSA	10,444	13,650	12,100	1,657	7.6
Nigeria	3,184	5,816	4,361	1,177	17.0
Ghana	66	345	357	291	132.1
Republic of the Congo	63	80	277	214	109.5
Côte d’Ivoire	71	103	219	148	75.8
Madagascar	97	156	194	97	41.4
Ethiopia	69	93	159	90	51.6
All other SSA	6,893	7,058	6,534	-359	-5.2

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

The following section profiles each of the top six product groups in terms of the absolute growth of U.S. imports from SSA during 2016–18 (table 3.1). It also profiles the top six growth products in value terms on U.S. imports under AGOA during 2016–18 (table 3.4).

## Fastest-growing U.S. Imports of Goods from SSA Countries

### Crude Petroleum

Crude petroleum is a naturally occurring liquid mixture of hydrocarbons, formed from fossilized plants and animals and found in underground pools or reservoirs; in spaces within sedimentary rocks; and in mixtures of sand, clay, and water near the surface (as oil sands).<sup>188</sup> Crude petroleum is consumed by petroleum refineries, which process the crude into finished products such as motor gasoline and diesel, as well as into intermediate goods used as inputs for petrochemical and plastics manufacturing.

### Overview of U.S. Imports

The value of U.S. crude petroleum imports from SSA increased by \$2 billion to \$9 billion (a 12.9 percent CAGR) from 2016 to 2018 (table 3.6). However, this increase reflects the near doubling of the world price for crude petroleum during the period; the volume of U.S. imports from 2016 to 2018 actually declined substantially. U.S. imports from SSA increased in volume from 2016 to 2017, but then decreased substantially from 2017 to 2018. Most U.S. imports of crude petroleum from SSA between 2016 and 2018 received AGOA preferential treatment (i.e., entered duty free). However, the U.S. “normal trade relations” (NTR) rates for crude petroleum imports are already very low, ranging from 5.3 cents to 10.5 cents per barrel.<sup>189</sup> This low duty rate means that benefits from AGOA preferences for U.S. imports of crude petroleum from SSA are relatively small, and some traders may not find them worth the additional paperwork.

In 2018, U.S. imports for consumption of crude petroleum from SSA under AGOA were nearly \$8 billion, an increase of about \$2 billion (13.8 percent CAGR) from 2016. In 2018, about 88 percent of crude petroleum imported from SSA entered the United States under the AGOA program.

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<sup>188</sup> EIA, “Oil: Crude and Petroleum Products Explained,” May 23, 2019.

<sup>189</sup> NTR tariffs are the duties that countries charge on imports from other members of the WTO, unless the other country is part of a preferential trade agreement. (They are called most-favored-nation, or MFN, tariffs outside the United States.) For crude petroleum, the NTR rate for U.S. imports from SSA averaged less than 0.2 percent ad valorem between 2016 and 2018. USITC DataWeb/USDOC, HS heading 2709 (accessed September 23, 2019). “HS” stands for the Harmonized Commodity Description and Coding System, an international system for classifying traded products. “Ad valorem” is a rate of duty expressed as a percentage of the appraised customs value of the imported good; the actual tariff may be levied in other terms, such as dollars per ton.

**Table 3.6** Crude petroleum: U.S. general imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
	Million \$				%
Total SSA	7,258	10,160	9,252	1,994	12.9
Nigeria	3,655	6,313	5,003	1,347	17.0
Angola	2,442	2,402	2,420	-22	-0.5
All other SSA	1,160	1,445	1,829	669	25.6

Source: USITC DataWeb/USDOC (accessed July 23, 2019). All crude petroleum is in digest EP04 and enters under HTS 2709.

Note: Due to rounding, figures may not add up to totals shown.

## Key Factors Affecting U.S. Imports, 2016–18

The volume of U.S. imports of crude petroleum from SSA fell by 40 million barrels (-12.7 percent CAGR) from 2016 to 2018 from 170 million barrels to 129 million barrels; these imports increased in volume in 2017 but then fell in 2018 below 2016 levels. The net decline in imports was driven by a 26-million-barrel drop in U.S. crude imports from Angola.<sup>190</sup> U.S. crude imports from Nigeria also declined in volume by 9 million barrels.<sup>191</sup> The decline in the volume of U.S. crude petroleum imports from SSA reflected an overall reduction in U.S. imports in 2018, as well as lower crude petroleum production in Angola. U.S. crude petroleum imports from all countries declined in volume by 120 million barrels (2.2 percent CAGR) from 2016 to 2018.<sup>192</sup> However, imports from SSA comprised a disproportionately large share of the decline. Angola's output fell by about 92 million barrels (-7.6 percent CAGR) from 2016 to 2018, as foreign investment dropped in response to lower crude prices and production from existing projects declined.<sup>193</sup> Meanwhile, Nigerian crude continued to be displaced in the U.S. market by rising levels of domestically produced crude petroleum with similar chemical properties.<sup>194</sup>

As mentioned above, the net increase in import value from 2016 to 2018 primarily reflects a large increase in average crude petroleum prices over the period. Prices for crude petroleum were relatively low in 2016, with the main international benchmark (Brent) averaging just \$44 per barrel. The average spot price for Brent rose to \$71 in 2018 (a 63.5 percent increase).<sup>195</sup> The rise in prices was largely due to a tighter global supply, resulting from three factors in particular: an agreement in late 2016 led by members of the Organization of the Petroleum Exporting Countries (OPEC) to jointly reduce petroleum output; the United States' reimposing sanctions on Iranian exports in 2018; and accelerating production declines in Venezuela in 2018.<sup>196</sup> Moderate increases in global demand over the period also pushed

<sup>190</sup> USITC DataWeb/USDOC, HS heading 2709 (accessed March 17, 2020).

<sup>191</sup> USITC DataWeb/USDOC, HS heading 2709 (accessed July 25, 2019).

<sup>192</sup> USITC DataWeb/USDOC, HS heading 2709 (accessed August 12, 2019).

<sup>193</sup> Angola's crude petroleum resources are relatively expensive to develop and have relatively steep declines in production rates, increasing the impact of the 2014 drop in crude prices. Smith, "Discoveries Boost Angola Upstream Mood," August 27, 2019.

<sup>194</sup> OPEC, "Table 3.5" June 3, 2019; Browning, "Squeezed by U.S. Shale," April 8, 2019.

<sup>195</sup> EIA, "Spot Prices" (accessed July 25, 2019).

<sup>196</sup> The United States announced in May 2018 that it would re-impose sanctions on Iranian crude petroleum exports in November 2018, but issued six-month waivers to China, India, South Korea, Japan, Turkey, Taiwan, Greece, and Italy; the waivers expired on May 1, 2019. EIA, "Crude Oil Prices Increased in 2017," January 3, 2018;

prices higher. Eventually, growth in U.S. production more than offset the OPEC-led cuts and the declines in Iran and Venezuela, but it was concentrated in the second half of 2018 (after prices had already risen considerably).<sup>197</sup>

## Precious Metals and Non-numismatic Coins

Products in this group include silver, gold, and the platinum-group metals (PGMs)—platinum, palladium, iridium, rhodium, ruthenium, and osmium. Precious metals are traded in unrefined forms (gold and silver dorés and PGM mattes), in refined unwrought forms (bullion, grains, and minted bars), in semi-manufactured forms (leaf, wire, etc.), as waste and scrap, and as non-numismatic (investment or non-collectable) coins.

### Overview of U.S. Imports

Most of the precious metals imported into the United States from SSA<sup>198</sup> are PGMs and gold, predominantly from South Africa (table 3.7). South Africa is the world's leading PGM producer<sup>199</sup> and still a significant gold producer, despite declining gold mine output in recent years.<sup>200</sup> During 2016–18, U.S. PGM imports from SSA increased by \$863 million and gold imports by \$106 million, although they recorded similar CAGRs of 29.2 percent for PGMs and 29.9 percent for gold.

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Lynch, "What Happened to Oil Prices in 2018?" January 2, 2019; Wadhams, "U.S. Says No Change in Plans," May 30, 2019.

<sup>197</sup> Production from Venezuela, Iran, and countries participating in the OPEC-led cuts between 2016 and 2018 declined by about 1.9 million barrels per day, while U.S. production grew by 2.2 million barrels per day. OPEC "Table 3.5," June 3, 2019; EIA, "Crude Oil Production" (accessed December 3, 2019).

<sup>198</sup> Because precious metals enter the U.S. market either free of duty or with minimal duty rates for certain semi-manufactured forms of gold and silver, SSA countries did not rely on the AGOA or GSP programs during 2016–18.

<sup>199</sup> South Africa accounted for 91.3 percent of the world's identified PGM mine reserves in 2016–18. Singerling, "Platinum-Group Metals," February 2019, 125; Loferski, "Platinum-Group Metals," January 2018 and January 2017, 125.

<sup>200</sup> George, "Gold," February 2019 and January 2018, 71. See also table 3.9.

**Table 3.7** Precious metals and non-numismatic coins: U.S. general imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
		Million \$			%
Precious metals and non-numismatic coins	1,501	2,086	2,443	941	27.6
Platinum-group metals	1,291	1,961	2,154	863	29.2
South Africa	1,291	1,961	2,154	863	29.2
All other SSA	<sup>(a)</sup>	<sup>(a)</sup>	<sup>(a)</sup>	<sup>(a)</sup>	-40.4
Gold	154	51	260	106	29.9
South Africa	142	41	253	111	33.6
Ghana	11	8	4	-7	-38.2
All other SSA	1	2	2	1	56.2
All other products <sup>b</sup>	57	74	29	-28	-28.5

Source: USITC DataWeb/USDOC (accessed July 2, 2019). All precious metals and non-numismatic coins are in digest MM020. Platinum-group metals enter under HTS 7110.11.0010, 7110.11.0020, 7110.11.0050, 7110.19.0000, 7110.21.0000, 7110.29.0000, 7110.31.0000, 7110.39.0000, 7110.41.0010, 7110.41.0020, 7110.41.0030, 7110.41.0050, 7110.49.0010, 7110.49.0050, and 7111.00.0000, and gold enters under HTS 7108.11.0000, 7108.12.1013, 7108.12.1017, 7108.12.1020, 7108.12.5010, 7108.12.5050, 7108.13.1000, 7108.13.5500, 7108.13.7000, 7108.20.000, and 7109.00.00.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Predominantly non-numismatic coins from South Africa.

## Key Factors Affecting U.S. Imports, 2016–18

Despite increased PGM output in 2016–18 from two operating domestic mines, the United States remained highly dependent on imports to meet its PGM consumption needs.<sup>201</sup> North American consumption remained relatively steady for platinum but fell for palladium during 2016–18, despite increased demand associated with automotive emissions-control catalysts (autocatalysts),<sup>202</sup> the predominant end-use application for PGMs.<sup>203</sup> The quantity of U.S. PGM imports from SSA in unwrought forms rose, while those of semi-manufactured forms fell. Rising prices for palladium, rhodium, iridium, and ruthenium more than offset declining prices for platinum and augmented the values of the overall increased quantities imported.<sup>204</sup>

Increased U.S. imports of PGMs from SSA were also likely driven in part by the integrated value chain of major SSA producers of PGMs. Downstream consuming industries (particularly autocatalyst

<sup>201</sup> For example, annual U.S. net import reliance, as a share of apparent domestic consumption, rose from 66 percent to 73 percent for platinum but fell from 53 percent to 33 percent for palladium during 2016–18, in part because mined domestic PGM ores contained 3.4 times more palladium than platinum. Singerling, “Platinum-Group Metals,” February 2019, 124–25; Loferski, “Platinum-Group Metals,” January 2018 and January 2017, 124–25.

<sup>202</sup> For further information about South Africa’s crucial role as a supplier of PGMs to the motor vehicle value chain, see box 4.1 on catalytic converters in chapter 4.

<sup>203</sup> During 2016–18, 30.1–32.8 percent of all platinum and 84.4–88.0 percent of all palladium consumed in North America were used for manufacturing autocatalysts. Cowley, *PGM Market Report*, May 2019, 36, 40.

<sup>204</sup> LBMA, Precious Metals Prices database (accessed June 18, 2019); Singerling, “Platinum-Group Metals,” February 2019, 124; Singerling, “Platinum-Group Metals in January 2019,” April 2019, 3.

manufacturers)<sup>205</sup> consider availability as important as, or even more important than, price for PGMs.<sup>206</sup> South Africa is a critical link in the global supply chain supplying refined PGMs in the various required forms. Three major South African PGM producers are fully integrated from mining through fabrication and marketing, operating PGM refineries for their own mined output and that of less integrated domestic and foreign producers that mine and smelt PGMs.<sup>207</sup>

Also contributing to increased U.S. imports of PGMs from SSA were the ongoing corporate restructuring efforts that preserved and even enhanced the South African precious-metals industry's ability to supply PGMs. South Africa-based Sibanye Gold Ltd. evolved from solely a gold producer by acquiring PGM producers to diversify itself into a leading precious-metals firm—Sibanye-Stillwater—with multinational operations in both gold and PGMs.<sup>208</sup> Since 2016, Sibanye has acquired several South African PGM producers, including Aquarius Platinum Ltd. (in April 2016),<sup>209</sup> Rustenburg Platinum Mines (in November 2016),<sup>210</sup> and cash-strapped Lonmin Plc (acquisition announced in December 2017 and completed in June 2019).<sup>211</sup> Moreover, Sibanye's acquisition of Colorado-based Stillwater Mining Co. (in May 2017) created a direct corporate relationship between the South African and U.S. PGM mining industries.<sup>212</sup>

The United States will likely continue importing PGMs from SSA due to several factors: (1) South Africa's predominance as the world's largest PGM supplier, (2) the insufficiency of U.S. mine and scrap-recovery output to meet U.S. domestic consumption requirements, (3) consuming industries' long-standing reliance on South Africa's participation in the U.S. PGM supply chain, and (4) the recently formed corporate ties between the U.S. and South African PGM industries.

The increase in U.S. imports of gold from SSA from 2016 to 2018 was driven by a combination of demand and supply factors. After a slight downturn in 2016 from the previous year's level, U.S. gold consumption resumed growing. In 2017, rising gold consumption was driven by more robust demand for high-end jewelry, while both lower-carat, mass-market jewelry and high-end jewelry were in demand in 2018.<sup>213</sup> The United States imported larger quantities of gold from SSA over this period which, combined with a slight price rise, drove the increase in import values (tables 3.8 and 3.9).

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<sup>205</sup> South Africa also produces autocatalysts. For further information, see box 4.1 on catalytic converters in chapter 4 in this report.

<sup>206</sup> WPIC, "Palladium Premium Indicates Platinum Opportunity," October 2018.

<sup>207</sup> These three producers—Anglo American Platinum Ltd., Impala Platinum Ltd., and Lonmin Plc—sell refined PGMs in both unwrought and semi-manufactured forms. IPGMA, "Member Companies" (accessed September 16, 2019).

<sup>208</sup> Cornish, "Sibanye-Stillwater: Grounded in Gold, Flourishing in PGMs," September 2019; Shabalala and Stoddard, "South Africa's Sibanye-Stillwater to Be No. 2," December 14, 2017.

<sup>209</sup> Gilroy, "What's Next for Sibanye?" April 28, 2016; Sibanye-Stillwater, "Mimosa" (accessed September 17, 2019).

<sup>210</sup> *Mining Review Africa*, "Sibanye's Acquisition of Rustenburg Operations," October 19, 2016.

<sup>211</sup> e-NCA, "Sibanye-Stillwater to Acquire Lonmin," December 14, 2017; Shabalala and Stoddard, "South Africa's Sibanye-Stillwater to Be No. 2," December 14, 2017.

<sup>212</sup> Stillwater, "Stillwater Mining Company Announces Completion of Acquisition," May 4, 2017; Volz, "South African Company Acquires Stillwater Mining Co.," May 4, 2017.

<sup>213</sup> WGC, "Gold Demand Trends: Full Year and Q4 2018," January 31, 2019, 5; "Gold Demand Trends Full Year 2017," February 6, 2018, 5; "Gold Demand Trends Full Year 2016," February 3, 2017, 5.

The increase in U.S. imports of gold from SSA was also driven by the alliance of South Africa's jointly owned Rand Refinery<sup>214</sup> and U.S.-based Dillion Gage Group Inc., which allows Rand to sell its gold bullion bars directly into the U.S. market.<sup>215</sup> As the world's largest gold refinery and the only such facility located on the African continent, Rand processes and markets gold originating from both domestic and foreign mines, including those located in other SSA countries.<sup>216</sup>

However, U.S. imports of refined gold do not necessarily originate in SSA to the same degree in any given year. One reason for this is that South African gold output has been declining since the early 1990s,<sup>217</sup> a decline that continues to the present day. An even more important reason is the highly diversified and shifting set of global trade patterns among major mines, refineries, fabricators, commodity exchange warehouses, investment funds, central banks, and others.

## Natural and Synthetic Gemstones

Products in this group include natural and cultured pearls, industrial and gem-quality diamonds, colored precious gemstones, semiprecious gemstones, and synthetic or reconstructed gemstones.

### Overview of U.S. Imports

U.S. imports of natural and synthetic gemstones from SSA grew at a CAGR of 23.9 percent from 2016 to 2018 (table 3.8). Gem-quality and industrial diamonds, whether or not worked (cut or polished), but not mounted or set, were the predominant gemstones imported into the United States from SSA countries in 2016–18, making up 90.7–93.8 percent of all U.S. gemstone imports in this period.<sup>218</sup> Angola, Botswana, Lesotho, Namibia, and South Africa together accounted for 95.5 percent of all U.S. diamond imports from SSA in 2018. Among them, the highest CAGRs were recorded by Lesotho (171.3 percent) and Namibia (65.9 percent) during 2016–18.

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<sup>214</sup> The joint owners are Anglo Gold Ashanti Ltd., DRD GOLD Ltd., Gold Fields, Harmony Gold Mining Co., and Sibanye-Stillwater Ltd. Rand Refinery, "About Us" (accessed September 16, 2019).

<sup>215</sup> *BusinessReport*, "Rand Refinery in Deal to Sell Gold in US," May 16, 2013.

<sup>216</sup> Rand Refinery, "Services" (accessed September 16, 2019).

<sup>217</sup> South African mined gold output fell in each successive year since the peak output level of 619 metric tons in 1993 down to an estimated 120 metric tons by 2018. George, "Gold," January 2016 to February 2019; Amey, "Gold," January 1998 to January 2005; Sehnke, "Gold," January 1996 to February 1997; Van Oss and Mobbs, "The Mineral Industry of South Africa," 1993, 157, table 1, "South Africa: Output of Mineral Commodities."

<sup>218</sup> Diamonds enter the U.S. market free of duty, so it is the SSA exporters of certain dutiable colored gemstones that benefit from the AGOA and GSP programs for duty-free access to the U.S. market.

**Table 3.8** Natural and synthetic gemstones: U.S. general imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute	Compound
				change	annual growth
				2016–18	rate (CAGR)
		Million \$			2016–18
					%
Natural and synthetic gemstones	1,482	1,856	2,273	792	23.9
Diamonds	1,379	1,682	2,133	754	24.4
South Africa	559	601	1,183	624	45.5
Lesotho	13	16	98	85	171.3
Namibia	36	68	99	63	65.9
Botswana	418	761	459	41	4.8
Angola	233	136	198	-35	-7.7
All other SSA	121	100	96	-25	-10.8
All other products	102	173	140	38	17.1

Source: USITC DataWeb/USDOC (accessed July 2, 2019). All products are in digest MM019. Diamonds enter under HTS 7102.10.0000, 7102.21.1010, 7102.21.1020, 7102.21.3000, 7102.21.4000, 7102.29.0010, 7102.29.0020, 7102.29.0050, 7102.31.0000, 7102.39.0010, and 7102.39.0050.

Note: Due to rounding, figures may not add up to totals shown.

## Key Factors Affecting U.S. Imports, 2016–18

The increase in U.S. imports of diamonds from SSA is driven in part by an increase in consumer demand from the United States, the largest diamond-consuming market in the world<sup>219</sup> (with a 48 percent global share in 2017)<sup>220</sup> and a major processing and trading center for gemstones. The lack of any notable domestically mined diamond resources renders the U.S. market almost entirely dependent upon foreign sources for gem-quality diamonds.<sup>221</sup> U.S. retail sales of precious jewelry, including diamond jewelry, grew each successive year since the 2008–09 recession.<sup>222</sup> The decline in unit values<sup>223</sup> exerted a lesser impact than the rise in quantities on the increasing value of U.S. imports during 2016–18. Greater shares of higher-priced, larger-size (weighing more than 0.5 carat) diamonds from SSA also contributed to increased value of U.S. imports of diamonds from SSA over this period.

SSA is a leading producer of diamonds, especially from large-scale, low-cost, long-life mines. SSA diamond output rose at a CAGR of 3.7 percent, from 37 million carats in 2016 to 40 million carats in 2018.<sup>224</sup> Botswana is the largest source of diamonds within the region, with production of higher unit-

<sup>219</sup> USITC, hearing transcript, July 24, 2019, 320 (Tiffany Stevens, The Jewelers Vigilance Committee).

<sup>220</sup> De Beers, *The Diamond Insight Report 2018*, September 13, 2018, 5.

<sup>221</sup> Domestic production consists predominantly of semiprecious and synthetic gemstones. U.S. annual net import reliance (imports less exports including re-exports) as a share of apparent consumption was 99 percent across all gemstones in 2016–18. Olson, “Gemstones,” February 2019, 66.

<sup>222</sup> Golan, “The US Jewelry Market Is Much Smaller Than You Think,” September 4, 2018; Rapaport News, “Holiday Jewelry Sales Rise 4%,” December 27, 2018; “Holiday Sales Growth Misses Expectations,” February 17, 2019.

<sup>223</sup> Unit prices fell across all size categories of diamonds imported by the United States from SSA during 2016–18, as the fall in prices (at a CAGR of 42.6 percent) for smaller-size diamonds (weighing 0.5 carat or less) exceeded the rise in prices (at a CAGR of 7.9 percent) for larger-size diamonds.

<sup>224</sup> Olson, “Gemstones,” February 2019, 67; January 2018, 67.

value stones<sup>225</sup> especially from some of the largest mines (at Jwaneng and Orapa) in the world.<sup>226</sup> Other major mines are located in Angola (Catoca and Endiama) and South Africa (Venetia). Moreover, several major mines in Angola (Lulo), Botswana (Jwaneng, Karowe, and Orapa), Lesotho (Letseng), and South Africa (Kimberley) are also considered among the lowest-cost producers in the world, with cash costs per metric ton of ore below that of major diamond mines in Canada and Russia.<sup>227</sup>

The De Beers Group (based in the United Kingdom) and other major multinational diamond firms—ALROSA (Russia), Petra Diamonds Ltd. (United Kingdom), and Rio Tinto Diamonds (Australia)—have significant ownership holdings in the SSA diamond industry, mostly via joint ventures with the host governments.<sup>228</sup> These multinationals not only produce, process, and market SSA diamonds, but are also large enough to reportedly influence the global diamond trade by adjusting their own mine outputs, inventories, and offer prices.<sup>229</sup> Yet, despite ongoing efforts to advance their downstream processing capabilities, the African cutting and polishing sectors are characterized as having low productivity and high cost structures.<sup>230</sup>

## Spices

The product group of spices encompasses a wide range of primary agricultural products typically intended as flavoring agents for food production or as aromatic additives in consumer chemical products. This section describes imports of products entering the United States under chapter 09 of the Harmonized Tariff Schedule of the United States (HTS) and will focus primarily on vanilla, the leading spice imported from SSA.

### Overview of U.S. Imports

Between 2016 and 2018 there were five major sub-Saharan African sources of U.S. imports of spices: Madagascar, South Africa, Nigeria, Comoros, and Uganda. The major imports from these countries were vanilla, cloves, ginger, pepper, and spice blends. Nigeria saw a decline of 19.8 percent CAGR in total spice exports to the United States. This was overwhelmingly offset by increases in imports of vanilla from Uganda (125.6 percent CAGR) and Madagascar (52.0 percent CAGR) and pepper from South Africa (15.6 percent CAGR).<sup>231</sup> As shown in table 3.9, the increase in imports of spices from SSA is driven almost entirely by imports of vanilla from Madagascar. Vanilla in all forms was the primary driver of growth in Madagascar and Uganda, while pepper in all forms was the primary driver of growth in South Africa. U.S. imports of all other spices from sub-Saharan Africa declined, including Nigeria and Comoros.

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<sup>225</sup> Rapaport News, “Global Diamond Production Value Rises,” July 7, 2019.

<sup>226</sup> Zimnisky, “Global Diamond Production by Mine, 2018,” March 3, 2018.

<sup>227</sup> Zimnisky, “Replenishing the Diamond Pipeline,” August 20, 2018.

<sup>228</sup> Zimnisky, “Global Diamond Production by Mine, 2018,” March 3, 2018.

<sup>229</sup> Mining Stock Education, “Diamond Miners Look Poised for a Rebound,” April 18, 2019.

<sup>230</sup> Linde, Geyler, and Epstein, *The Global Diamond Industry 2018*, December 5, 2018, 13.

<sup>231</sup> USITC DataWeb/USDOC (accessed November 14, 2019).

**Table 3.9** Spices: U.S. general imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
		Million \$			%
Spices	242	436	542	300	49.7
Vanilla	230	423	531	301	52.1
Madagascar	225	398	520	295	52.0
Uganda	2	19	10	8	125.6
Comoros	2	4	2	( <sup>a</sup> )	-12.2
All other SSA	1	2	0	-1	-100
All other products	12	12	11	-1	-6.5

Source: USITC DataWeb/USDOC (accessed November 14, 2019). All spices are in digest AG029 and enter under HTS subheadings 0904.11.00, 0904.12.00, 0904.21.20, 0904.21.60, 0904.21.80, 0904.22.20, 0904.22.73, 0904.22.76, 0905.10.00, 0905.20.00, 0906.11.00, 0906.19.00, 0906.20.00, 0907.10.00, 0907.20.00, 0908.11.00, 0908.31.00, 0908.32.00, 0909.21.00, 0909.31.00, 0909.32.00, 0909.61.00, 0909.62.00, 0910.11.00, 0910.12.00, 0910.30.00, 0910.91.00, 0910.99.06, 0910.99.07, 0910.99.10, 0910.99.50, 0910.99.60, 1207.50.00, and 2103.30.40.

Note: Due to rounding, figures may not add to totals shown.

<sup>a</sup> Absolute change was less than \$500,000.

Regardless of source, vanilla—in any form—represented 95 percent of spice imports from SSA by value in 2016 and 98 percent of spice imports from SSA by value in 2018. U.S. imports of vanilla from SSA increased by \$301 million from 2016 to 2018, a CAGR of 52.1 percent. This growth in the value of imports of vanilla from SSA was due to an increase in global vanilla prices.

## Key Factors Affecting U.S. Imports, 2016-18

The increase in U.S. imports of vanilla from 2016 to 2018 is driven by an increase in unit prices. Unit prices of vanilla, whether or not crushed or ground, from SSA increased by 24.7 percent from \$212/kg in 2017 to \$448/kg in 2018.<sup>232</sup> Before 2011, low vanilla prices coupled with the labor-intensive nature of vanilla production caused many farmers to switch to other crops, reducing global supply. Beginning in 2011 and continuing through 2018, firms began to switch back to natural vanilla, with major global consumers such as Nestlé and Hershey committing to using only natural ingredients by 2021 due to changing consumer preferences.<sup>233</sup> Hence, global demand has increased, but available quantity supplied has not, thus increasing prices—there are fewer vanilla-producing farms than 20 years ago.<sup>234</sup> Furthermore, vanilla vines take several years to mature, and it takes almost a year to grow and then process vanilla beans. Extreme weather, weak crop security, and hoarding by exporters have further raised prices.<sup>235</sup>

<sup>232</sup> USITC DataWeb/USDOC (accessed November 14, 2019).

<sup>233</sup> Charles, “Our Love of ‘All Natural,’” June 16, 2017.

<sup>234</sup> From 2016 to 2018, world imports of vanilla from Madagascar grew at a 4.9 percent CAGR by volume, but at a 43.8 percent CAGR by value. IHS Markit, Global Trade Atlas (accessed March 12, 2020); CooksVanilla, “Vanilla Market Report,” October 18, 2019.

<sup>235</sup> Economist, “Why There Is a Worldwide Shortage of Vanilla,” March 28, 2018.

## Ferroalloys

Ferroalloys are alloys of iron with one or more other elements that are used in steelmaking to impart distinctive qualities such as strength, ductility, and corrosion resistance to steel or to serve important functions during steel refining.<sup>236</sup> This group includes bulk ferroalloys, which are produced in large quantities and include ferrochromium, ferromanganese, ferrosilicon, and ferrosilicon manganese (also known as silicomanganese), as well as noble ferroalloys, which are produced in smaller quantities. This section will primarily focus on ferrochromium and ferromanganese, the leading ferroalloys imported from SSA.

### Overview of U.S. Imports

During 2016–18, the value of U.S. imports of ferroalloys from SSA rose by \$251 million (31.3 percent CAGR) to \$597 million. This growth was driven principally by increases in imports of ferrochromium, ferromanganese, and ferrosilicon manganese, which rose \$136 million (24.4 percent), \$74 million (63.5 percent), and \$38 million (32.3 percent) respectively (table 3.10). These three ferroalloys accounted for nearly all U.S. ferroalloy imports from SSA, by value. South Africa was the primary source of SSA ferroalloys imports during 2016–18, accounting for the majority of ferrochromium imports and essentially all ferromanganese and ferrosilicon manganese imports. Zimbabwe was the other main SSA source of ferrochromium: U.S. imports from Zimbabwe increased by \$48 million (202.9 percent) during 2016–18.

In 2018, U.S. imports from SSA accounted for about 17 percent of total U.S. ferroalloy imports from the world, down somewhat from 20 percent in 2016. Other leading U.S. suppliers of ferroalloys during 2016–18 included Austria, Australia, Brazil, Canada, Chile, Georgia, Kazakhstan, Norway, and Russia.

In 2018, U.S. imports for consumption of ferroalloys from SSA under AGOA came to \$586 million, an increase of \$252 million (32.3 percent CAGR) from 2016. In 2018, about 98 percent of all ferroalloys imported from SSA entered the United States under the AGOA program.

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<sup>236</sup> While all steel contains some ferroalloys, the chemical composition and variety of the steel produced determines the type and the amount of ferroalloys used. For instance, one of the most common types of stainless steel produced (austenitic type 304, used for its formability and resistance to corrosion) typically contains 18 percent chromium and 2 percent manganese. SSINA, “Design Guidelines for the Selection and Use” (accessed September 18, 2019) 2, 8.

**Table 3.10** Ferroalloys: U.S. general imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
	Million \$				2016–18
					%
Ferroalloys	346	680	597	251	31.3
Ferrochromium	248	470	383	136	24.4
South Africa	242	442	329	87	16.6
Zimbabwe	6	28	54	48	202.9
All other SSA	0	0	0	0	( <sup>a</sup> )
Ferromanganese	44	123	118	74	63.5
South Africa	44	123	118	74	63.5
All other SSA	0	0	0	0	( <sup>a</sup> )
Ferrosilicon manganese	50	82	87	38	32.3
South Africa	48	82	86	37	31.7
All other SSA	0	0	1	1	147.1
All other products <sup>b</sup>	4	5	8	4	39.0

Source: USITC DataWeb/USDOC (accessed August 28, 2019).

Notes: All products are in digest MM022. Ferrochromium enters under HTS 7202.41.0000, 7202.49.1000, and 7202.49.5010. Ferromanganese enters under HTS 7202.11.1000, 7202.11.5000, 7202.19.1000, and 7202.19.5000. Ferrosilicon manganese enters under HTS 7202.30.0000. Due to rounding, figures may not add to totals shown.

<sup>a</sup> Unable to calculate.

<sup>b</sup> Includes ferrovanadium, ferronickel, and ferrosilicon.

## Key Factors Affecting U.S. Imports

U.S. demand for ferroalloys is met by a combination of relatively limited domestic primary production, imports, and material recycled from scrap. For the two leading ferroalloys imported from SSA, ferrochromium and ferromanganese, there is little or no U.S. domestic production. During 2016–18, there was no ferrochromium production in the United States, as has been the case for many years. There were two domestic ferromanganese plants operating during 2016–18; however, they were completely reliant on imported manganese ore (primarily from Gabon and South Africa) for ferroalloy production.<sup>237</sup> Because there is little domestic production of these ferroalloys, imports from SSA, primarily South Africa and Zimbabwe, are an important component of U.S. supply.

As is the case with many metals and mineral commodities, the price of ferroalloys can fluctuate greatly from year to year, owing to changes in the prices of the raw materials used in their production as well as shifts in downstream demand. Although the overall value of the ferroalloys imported increased significantly during 2016–18, some of this growth reflected price increases during that time period, while in other cases there were increases in both the value and volume of imports. Overall ferroalloy import values trended upwards, though in some instances values in 2018 were lower than in 2017.

In the case of ferrochromium imported from South Africa, there was an increase in the value of imports during 2016–18; however, the volume of ferrochromium imported declined by 10 percent during that

<sup>237</sup> USGS, “Ferroalloys,” 2018.

period.<sup>238</sup> Ferrochromium prices increased in late 2016 and remained elevated through 2018 owing to increases in the price of chrome ore,<sup>239</sup> the primary raw material used to produce ferrochromium.<sup>240</sup> South Africa (the main source of ferroalloys imported from SSA) was a significant global producer of ferrochromium and ferromanganese, primarily because it has large reserves of the raw materials (in the form of ore) used to produce them.<sup>241</sup> South Africa was also the second-leading global producer of ferrochromium, behind China, and one of the top producers of ferromanganese.<sup>242</sup> In 2017, the year for which the most recent data are available, South Africa produced 4.1 million short tons (3.7 million metric tons) of ferrochromium and 661,000 short tons (600,000 metric tons) of ferromanganese.<sup>243</sup> South Africa's ferroalloys industry is export oriented, sending a significant amount of its ferrochromium and ferromanganese production to China, Europe, and the United States.<sup>244</sup>

U.S. ferrochromium imports from Zimbabwe increased in terms of both value and volume, partly due to significant ferrochromium production increases in Zimbabwe. Zimbabwe is a major ferrochromium supplier in SSA and has the second-largest chromite ore reserves in the world behind South Africa. The country's ferrochromium production has increased substantially recently, partially in response to efforts made by the government. According to reports, the government in Zimbabwe has made efforts to reduce exports of chromite ore and increase domestic value-added production in the form of ferrochromium.<sup>245</sup> During 2016–18, ferrochromium production in Zimbabwe increased by 138,303 metric tons (38.9 percent).<sup>246</sup>

Besides factors related to increasing production in SSA, the growth in U.S. consumption of ferroalloys due to increasing steel production, coupled with a limited U.S. domestic supply, likely also contributed to the rise in U.S. imports of ferroalloys from SSA from 2016 to 2018. As mentioned above, ferroalloys are predominantly used in the production of steel, and trends in ferroalloys consumption typically follow those for steel. According to the American Iron and Steel Institute, U.S. raw steel production was 86 million metric tons in 2018, a 10.2 percent increase from 2016.<sup>247</sup> Consumption of ferroalloys also increased. U.S. ferromanganese and ferrosilicon manganese consumption was estimated to have

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<sup>238</sup> The annual average unit value of ferrochromium imported from South Africa in 2018 was 50.7 percent higher than in 2016, leading to the increase in the total value of the imports from South Africa. USITC DataWeb/USDOC, HTS subheadings 7202.41 and 7202.49 (accessed September 18, 2019).

<sup>239</sup> Chromite is the commercial name of iron chromium oxide, a mineral composed of chromium and iron oxide that is naturally found in the earth's mantle. When extracted, it is referred to as chrome ore. KPMG, "Commodity Insights Bulletin: Chromite," November 2018.

<sup>240</sup> USGS, "Chromium," 2018.

<sup>241</sup> In 2018, South Africa was the leading global producer of chrome ore (used to produce ferrochromium) and manganese ore (used in ferromanganese). Roskill Information Services, "Chromium—Outlook to 2029, 15th Edition," June 16, 2019.

<sup>242</sup> USGS, "Ferroalloys," 2018.

<sup>243</sup> British Geological Survey, *World Mineral Production: 2013–2017*, 2019.

<sup>244</sup> *Mining Weekly*, "South Africa Crucial to Global Chrome Supply," November 7, 2017.

<sup>245</sup> Musekiwa, "Maximizing Growth, Beneficiation and Value Addition," May 31, 2019.

<sup>246</sup> Chamber of Mines of Zimbabwe, "Production Statistics" (accessed November 21, 2019).

<sup>247</sup> AISI, "AISI Releases 2018 Annual Statistical Report," July 29, 2019; AISI, "Profile 2017," May 3, 2017.

increased by 5.3 percent and 7.9 percent, respectively, in 2018 compared with that in 2016, primarily a result of increases in imports in response to the increase in domestic steel production in 2018.<sup>248</sup>

In the near future, U.S. imports of ferroalloys from SSA will continue to be tied to trends in domestic steel production. Recent U.S. trade actions, such as the imposition of national-security duties on steel under section 232 of the Trade Expansion Act of 1962, could lead to an increase in domestic steel production as well as an increase in imported ferroalloys from SSA that are used to make the steel.<sup>249</sup>

## Certain Ores, Concentrates, Ash, and Residues

This product group covers certain ores, concentrates, slag, ash, and residues of base metals, including those of manganese, tin, chromium, tungsten, uranium, and titanium.<sup>250</sup>

### Overview of U.S. Imports

U.S. general imports of certain ores, concentrates, slag, ash, and residues from SSA increased from \$484 million in 2016 to \$717 million in 2018, a CAGR of 21.7 percent (table 3.11). Imports from South Africa contributed most significantly to the category, accounting for approximately 65 percent of total U.S. imports in 2018, followed by those from Gabon and Madagascar with 11.6 and 5.1 percent, respectively. Three product groups accounted for most of the \$232 million increase in imports: titanium-containing slag, ores, and concentrates; manganese ores and concentrates; and chromium ores and concentrates.<sup>251</sup>

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<sup>248</sup> USGS, “Mineral Commodity Summaries: Manganese,” 2019.

<sup>249</sup> During the first seven months of 2019, U.S. steel mill shipments were 2.0 percent higher than during the same period in 2018. AISI, “July Steel Shipments Up 5.1 percent,” September 9, 2019.

<sup>250</sup> All products discussed in this section are contained within HTS chapter 26, which covers ores, slag, and ash.

<sup>251</sup> Titanium ores and concentrates and titanium slag are produced using different processes, but are used similarly by end-product manufacturers.

**Table 3.11** Certain ores, concentrates, ash, and residues: U.S. general imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR) 2016–18
	Million \$				%
Certain ores, concentrates, ash and residues	484	597	717	232	21.7
Titanium slag, and ores and concentrates	340	405	444	104	14.3
South Africa	247	298	361	114	20.9
Madagascar	16	37	33	18	45.8
All other SSA	77	70	50	-28	-20.0
Manganese ores and concentrates	36	59	107	71	72.4
South Africa	4	7	21	17	129.1
Gabon	32	52	86	54	63.9
Chromium ores and concentrates	26	32	55	28	45.4
South Africa	26	32	55	28	45.4
All other products	82	101	111	29	16.3

Source: USITC DataWeb/USDOC (accessed September 19, 2019). These products are all in digest MM007. Titanium slag and titanium ores and concentrates enter under HTS 2614.00.6020, 2614.00.6040, 2614.00.3000, and 2620.99.5000. Manganese ores and concentrates enter under HTS 2602.00.0040 and 2602.00.0060. Chromium ores and concentrates enter under HTS 2610.00.0020, 2610.00.0040, and 2610.00.0060.

Note: Due to rounding, figures may not add up to totals shown.

## Key Factors Affecting U.S. Imports, 2016–18

### Titanium Ore and Slag<sup>252</sup>

By value, imports of titanium ore and slag grew the fastest of any product in this group in 2016–18. Imports from South Africa and Madagascar both increased from 2016 to 2018, with imports from South Africa increasing from \$247 million to \$361 million and imports from Madagascar increasing from \$16 million to \$33 million. One of the main end-use products of titanium ores and concentrates and of slag, ash, and residues containing titanium is paint pigments. Titanium ores and concentrates and titanium slag are mainly used in making titanium dioxide (TiO<sub>2</sub>), an important pigment, whitening, and polishing abrasive.<sup>253</sup> Therefore, the overall demand for TiO<sub>2</sub> pigment is highly correlated to growth in the global residential housing, commercial construction, and packaging markets. Demand in the United States for

<sup>252</sup> Titanium ores and concentrates are the primary raw material for titanium dioxide, while titanium-containing slag is a byproduct of a smelting process. Ilmenite is the primary ore of titanium, and most of the ilmenite mined worldwide is used to manufacture titanium dioxide. Titanium slag, or metallurgical coke, is produced in smelters, where it is tapped from furnaces. In 2015, the titanium dioxide (TiO<sub>2</sub>) pigment market accounted for 83 percent of titanium demand. Titanium slag is a major source of raw material for pigment companies and it is used as a replacement of natural rutile and synthetic rutile. It has a high titanium content, generates low waste, is suitable for use in chloride and sulphate processing, and has a low chemical cost.

<sup>253</sup> An estimated 90 percent of TiO<sub>2</sub> is used in the pigments and paints end market, with the paint industry accounting for 55 percent of TiO<sub>2</sub> pigment consumption in 2015. USGS, “Titanium Minerals and Concentrates,” 2019; Roskill Information Services, “Titanium Minerals Global Industry, Market & Outlook,” December 8, 2016.

titanium ores, concentrates, and slag remained relatively stable based on apparent consumption from 2016 to 2018. However, import quantities increased by 21 percent, while the value of those same imports increased by 47 percent, suggesting an increase in prices of TiO<sub>2</sub>. For two other titanium products—ilmenite, a titanium oxide metal, which is used to produce titanium metal, and rutile, a form of titanium dioxide used to produce white, reflective pigments—prices increased by an average of 44 percent per metric ton from 2016 to 2018.<sup>254</sup>

## Manganese

The second leading growth category of imports was certain manganese ores and concentrates.<sup>255</sup> U.S. imports from 2016 to 2018 increased by an estimated \$71 million, of which \$54 million was from Gabon and \$17 million was from South Africa.<sup>256</sup> Manganese is an essential ingredient in steel making. The United States does not have domestic manganese resources, so the domestic steel industry relies on imports for its manganese needs. The United States requires about 400,000 metric tons per year, approximately 90 percent of which is consumed by the steel industry.<sup>257</sup>

According to World Steel Association production data, domestic production for steel, the main end product for manganese, increased in 2016–18 by 10.3 percent.<sup>258</sup> In addition, manganese is an important input material for electric car batteries. Growing demand for electric vehicle batteries and lithiated manganese dioxide batteries boosted manganese demand in the United States, which likely has contributed to the increase of U.S. imports of manganese from SSA.<sup>259</sup>

## Chromium

The value of U.S. imports of chromium ores and concentrates from South Africa increased by \$28 million in 2018, compared to 2016. Chromium is not mined in the United States and industry relies for its supply on imports in the form of chromite ore, ferrochromium, or chromium metal, or chromium recovered from domestically recycled metal.<sup>260</sup> Chromium is used to induce hardness, toughness, and chemical resistance in steel (i.e., to create stainless steel).

The increase in the value of U.S. imports of chromium ores from SSA was due to a rise in chromium prices and an increase in demand from the United States as well as to a shortage of supply by major global producers. According to USGS data, chromium ore prices experienced a 41 percent increase per ton from 2016 to 2018.<sup>261</sup> Supply constraints in the global chromium market created a shortage of the

<sup>254</sup> USGS, “Titanium Minerals and Concentrates,” 2019.

<sup>255</sup> The international Harmonized Commodity Description and Coding System (HS) subheading 2602.00 defines this set of products as follows: “Manganese ores and concentrates, including ferruginous manganese ores and concentrates with a manganese content of 20 percent or more, calculated on the dry weight.”

<sup>256</sup> South Africa is the largest global producer of high-grade manganese; Gabon is the fourth-largest producer of manganese, and its deposits are usually of a higher grade than South Africa’s. Palisade Research, “Manganese: The Third Electric Vehicle Metal,” March 24, 2017.

<sup>257</sup> USGS, “Mineral Commodity Summary, Manganese,” 2020.

<sup>258</sup> World Steel Association, *World Steel in Figures 2018, 2019* (accessed, January 22, 2020).

<sup>259</sup> Palisade Research, “Manganese: The Third Electric Vehicle Metal,” March 24, 2017.

<sup>260</sup> USGS, “Mineral Commodity Summary, Chromium,” 2019.

<sup>261</sup> USGS, “Mineral Commodity Summary, Chromium,” 2019.

ore, pushing up prices to a seven-year high in 2018.<sup>262</sup> The U.S. Geological Survey also estimates that U.S. chromium demand increased by 22 percent, while U.S. imports for consumption increased by about 19 percent from 2016 to 2018. A potential driver of U.S. import demand is the U.S. military budget, which suggests a possible increase in demand from the aerospace industry given that chromium is frequently used in the industry’s product coatings and finishes.<sup>263</sup> Also, the use of steel tubing containing 12 to 14 percent of chromium has increased in the last five years in the United States with the growth in drilling for shale gas. According to the U.S. Energy Information Administration, it is likely that the United States “becomes a net energy exporter in 2020 and remains so throughout the projection period [2050] as a result of large increases in crude oil, natural gas, and natural gas plant liquids (NGPL) production coupled with slow growth in U.S. energy consumption.”<sup>264</sup> Thus, the expansion of the oil and gas industry could further increase the demand for chromium.<sup>265</sup>

## Fastest-growing U.S. Imports for Consumption under AGOA

Crude petroleum and ferroalloys were the two product groups among the fastest-growing U.S. imports from SSA countries in 2016–18 overall and under AGOA. Discussions for these two product groups are provided earlier in this chapter, in the section describing “Fastest-growing U.S. Imports from SSA Countries.” Other product groups that exhibited large growth in imports from SSA countries under AGOA in 2016–18 are described in this section. These include apparel, miscellaneous inorganic chemicals, petroleum products, and edible nuts.

### Apparel

The apparel product group includes a wide range of knit, woven, and other apparel of natural and manmade fibers. It covers all types of apparel, including shirts (tops), pants (bottoms), suits, underwear, dresses, outerwear, and swimwear.

### Overview of U.S. Imports

U.S. imports for consumption of apparel from SSA under AGOA grew at a CAGR of 9.9 percent between 2016 and 2018 (table 3.12). Within SSA, five countries—Kenya, Lesotho, Madagascar, Mauritius, and Ethiopia—accounted for almost 95 percent of all apparel imported from the region under AGOA. Notably, imports from Ethiopia had a CAGR of 76.5 percent between 2016 and 2018, reflecting an increase in exports to the United States from \$37 million to \$114 million. This growth was primarily due

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<sup>262</sup> Ashreena, “Chromium Prices Jump 25%,” April 10, 2018.

<sup>263</sup> Ashreena, “Chromium Prices Jump 25%,” April 10, 2018.

<sup>264</sup> EIA, *Annual Energy Outlook 2019*, January 2019.

<sup>265</sup> Kielmas, “The Types of Metals Used” (accessed September 9, 2019). Chromium is used in strengthening steel alloys. As Kielmas notes, “Low-carbon steel containing 12 to 14 percent chromium is highly resistant to carbon dioxide, hydrogen sulfide, and the high temperatures found in the deepest oil and gas wells. The use of steel tubing containing this proportion of chromium has soared in the United States with the boom in drilling for shale gas.”

to the country’s focus on increasing garment production in industrial parks and its increased use of AGOA benefits. The largest categories of U.S. apparel imports from SSA in 2018 were men’s or boys’ cotton trousers and shorts, and men’s or boys’ knit shirts of manmade fiber (\$225 million and \$205 million, respectively).<sup>266</sup>

**Table 3.12** Apparel: U.S. imports under AGOA from SSA and selected SSA countries, 2016–18

Product and country source	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
	Million \$				%
Apparel	1,010	1,033	1,218	209	9.9
Madagascar	94	151	189	95	42.0
Ethiopia	37	56	114	78	76.5
Kenya	340	338	391	51	7.2
Lesotho	295	290	320	24	4.0
Tanzania	37	41	42	5	6.4
Mauritius	187	140	138	-49	-14.1
All other SSA	20	17	25	5	13.1

Source: USITC DataWeb/USDOC (accessed September 5, 2019). All apparel products are in digest TX05. Nearly all apparel imports enter under HTS chapters 61 and 62. A few items also enter under chapters 39, 40, 42, and 43.

Note: Due to rounding, figures may not add up to totals shown.

U.S. imports of apparel from SSA receive significant beneficial treatment under AGOA.<sup>267</sup> Nearly 98 percent of U.S. imports of apparel from SSA entered under AGOA in 2018. In addition, U.S. imports of apparel from SSA benefit from the “third-country fabric provision,” a critical element of AGOA, which allows lesser-developed AGOA member countries to source apparel inputs such as yarns and fabrics from countries other than the United States and other AGOA member countries and still receive duty-free treatment.<sup>268</sup> In 2018, 95.8 percent of U.S. apparel imports from SSA under AGOA entered under the third-country fabric provision.<sup>269</sup>

<sup>266</sup> In the OTEXA database, data for imports from SSA countries are broken out by product. However, data for imports from SSA countries under AGOA are not broken out by product. The categories of apparel listed in the sentence account for the largest categories of apparel from all SSA. USDOC, ITA, OTEXA, “U.S. General Imports by Part Category” (accessed September 5, 2019).

<sup>267</sup> AGOA benefits for these imports involve the use of a tariff-rate quota (TRQ). A TRQ imposes a relatively low “in-quota” tariff rate on imports until an annual allocation is met. Any imports beyond the TRQ allocation are subject to higher over-quota tariff rates. The TRQ level for U.S. imports from lesser-developed countries in SSA under AGOA is set at 3.5 percent of all U.S. imports entered during the previous 12-month period. The TRQ level for October 1, 2018–September 30, 2019 was over 1.0 billion square meter equivalents (SMEs) of apparel. Industry representatives have been encouraging policy makers to increase this level. USITC, hearing transcript, July 24, 2019, 286 (testimony of Steve Lamar, American Apparel & Footwear Association); CBP, “QB 18-136 2019 AGOA Limits” (accessed November 7, 2019).

<sup>268</sup> As of January 1, 2020, 25 SSA countries were eligible for the third-country fabric provision of AGOA. USDOC, ITA, OTEXA, “Summary of AGOA Apparel, Footwear, and Non-Textile Travel Goods” (accessed November 6, 2019). Paquette, “Trump Ends Trade Benefits for Cameroon,” November 2, 2019.

<sup>269</sup> USDOC, ITA, OTEXA, “Trade Preference Programs: U.S. Imports” (accessed September 29, 2019).

## Key Factors Affecting U.S. Imports, 2016–18

The increase of U.S. imports from SSA under AGOA from 2016 to 2018 is due to the 10-year extension of the AGOA program in 2015, the program's longest renewal since its implementation, and to the third-country fabric provision.<sup>270</sup> The 10-year program extension to 2025 and the program's flexible rules of origin for apparel have provided AGOA members with the predictability necessary to increase production and exports.<sup>271</sup> Much of the trade growth appears to be created by existing firms increasing production in SSA rather than new investments.<sup>272</sup>

Ethiopia, which had the highest CAGR among SSA countries in 2018, increased apparel exports to the United States between 2016 and 2018 by nearly \$78 million. This growth was driven by an increase in apparel manufacturing in Ethiopia overall and the country's use of AGOA. Ethiopia attracts foreign investment due to its low labor costs, availability of raw material, and the economic incentives created by the industrial parks throughout Ethiopia—many of which are specifically designed for garment manufacturing.<sup>273</sup> Since 2014, five industrial parks have been established in efforts to scale up textile industry capacity in the country and boost economic growth.<sup>274</sup> The industrial parks house apparel manufacturing for global brands such as H&M, Calvin Klein, and Tommy Hilfiger.<sup>275</sup>

In 2018, Madagascar, which had the second-highest CAGR among SSA countries that year, continued to rebound from the loss of its AGOA benefits between 2010 and 2014. Exports of apparel from Madagascar to the United States peaked in 2004, when they totaled over \$323 million.<sup>276</sup> The loss of its apparel benefits in 2010 sharply depressed the country's apparel exports to the United States before the country was reinstated in 2014.<sup>277</sup> Between 2010 and 2014, exports of apparel averaged only \$36 million.<sup>278</sup> Current increasing trade trends indicate a return to the export levels seen before the country's loss of benefits, with exports totaling nearly \$200 million in 2018.

Kenya, the largest AGOA country supplier of apparel to the United States in 2018, also benefited from the extension of AGOA and the third-country fabric provision. The country attracts foreign investment via Export Processing Zones (EPZs), which are mandated by the Kenyan government to promote and

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<sup>270</sup> Trade Preferences Extension Act of 2015, H.R. 1295, 114th Congress (2015–16).

<sup>271</sup> USITC, hearing transcript, July 24, 2019, 285–86 (testimony of Steve Lamar, American Apparel & Footwear Association).

<sup>272</sup> Industry representative, telephone interview by USITC staff, September 23, 2019.

<sup>273</sup> The centralization of textile manufacturing aims to allow faster skills training and knowledge transfers within the Ethiopian textile industry. Ethiopia currently houses nine industrial parks tailored for textile and garment production that are either operational or under construction. IPDC, "Our Parks" (accessed November 1, 2019); Yohannes, "Ethiopia: Textile Sector on the Rise," April 5, 2018; Alaudeen, "Ethiopia's Garment Workers," May 13, 2019.

<sup>274</sup> ETIDI, "About Us" (accessed November 1, 2019); USAID, East Africa Trade and Investment Hub, "Textile and Apparel in Africa," August 4, 2019.

<sup>275</sup> Alaudeen, "Ethiopia's Garment Workers," May 13, 2019.

<sup>276</sup> USITC DataWeb/USDOC (accessed November 5, 2019).

<sup>277</sup> Madagascar was reinstated into AGOA in June of 2014; however, it did not qualify for apparel benefits until December 2014. USTR, "President Obama Removes Swaziland," June 26, 2014; determinations under the African Growth and Opportunities Act, 79 Fed. Reg. 74157, December 15, 2015.

<sup>278</sup> USITC DataWeb/USDOC (accessed November 5, 2019).

facilitate export-oriented investments within Kenya beginning in 1990.<sup>279</sup> EPZs offer licensed companies certain fiscal incentives to set up facilities within their bounds—for example, exemptions from the value-added tax (VAT) and customs import duty on manufacturing inputs such as raw materials, machinery, and office equipment.<sup>280</sup> Moreover, Kenya’s apparel industry is well established and, as a result, has a skilled apparel workforce and a high worker retention rate.<sup>281</sup>

Other factors may also have affected the rise in apparel exports from SSA to the United States. Some multinational firms are looking for new sourcing options due to a rising emphasis on corporate social responsibility (CSR) in many countries.<sup>282</sup> Regional integration efforts among SSA countries could also be contributing to the increase. For example, the African Continental Free Trade Area intends to remove duties on goods shipped within the continent to develop regional value chains and strengthen manufacturing capacities in SSA.<sup>283</sup> According to the 2019 Fashion Industry Benchmarking Study, 83 percent of survey respondents expect to decrease sourcing from China over the next two years, up from 67 percent for the same question in 2018.<sup>284</sup> However, the same survey found that only 28 percent of respondents were sourcing from SSA, a nearly 6 percent decline from 2016. Almost half of the respondents attributed their hesitancy about investing in the region to the temporary nature of AGOA. Moreover, long lead times, lack of infrastructure, and high logistical costs continue to deter apparel retailers from investing in the AGOA region.<sup>285</sup>

## Miscellaneous Inorganic Chemicals

This category covers a wide range of intermediate chemical products. Many are compounds of precious metals, rare earth metals, vanadium, chromium, or aluminum that are used in the production of strengthened steel, catalysts, and tools.

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<sup>279</sup> EPZA Kenya, “Who We Are” (accessed November 5, 2019).

<sup>280</sup> EPZA Kenya, “EPZ Program” (accessed November 5, 2019).

<sup>281</sup> Government of Kenya, State Department for Trade, MITC, *Kenya National AGOA Strategy and Action Plan 2018–2023*, 2018 (accessed various dates).

<sup>282</sup> In 2018, one U.S. company, PVH, which has invested significantly in apparel manufacturing in the Hawassa industrial park in Ethiopia since 2014, received the Sustainable Operations Award for Corporate Excellence from the U.S. Secretary of State in recognition of its contributions to the growth and sustainable development of local communities in the region. Barrie, “PVH Wins Award for Sustainable Operations in Ethiopia,” September 13, 2018; Government of Kenya, State Department for Trade, MITC, *Kenya National AGOA Strategy and Action Plan 2018–2023*, 2018.

<sup>283</sup> For more information on SSA’s regional integration efforts, see chapter 8. The governments of Mauritius and Madagascar are collaborating on a joint venture to invest in Madagascar’s textile and apparel capacity via a “textile city” industrial zone. This initiative plans to take advantage of Mauritius’s more advanced value-added textile industry and Madagascar’s strong labor force in a regional, vertically integrated supply chain. Other countries, such as Kenya and Ethiopia, manufacture much of their apparel in industrial parks which allow them to vertically integrate apparel production and avoid some common logistical costs. Friedman, “Rules of Origin Could Make or Break,” June 28, 2019; Friedman, “Africa Starts to Blossom,” October 11, 2018; Anganan, “Mauritius and Madagascar Boost Garment Manufacturing Ties,” September 18, 2019.

<sup>284</sup> Gebreselassie, “Africa Continues to Face Challenges,” October 15, 2019.

<sup>285</sup> Lu, *2019 U.S. Fashion Industry Benchmarking Study*, July 2019, 35.

## Overview of U.S. Imports

U.S. imports of miscellaneous inorganic chemicals from SSA countries increased between 2016 and 2018 and were primarily composed of a limited number of products from a single country, South Africa (table 3.13). The value of these imports from SSA countries increased from \$109 million in 2016 to \$204 million in 2018 (CAGR of 36.8 percent). In 2018, the vast majority of U.S. imports in this category from SSA countries were in three product groups: vanadium oxides and hydroxides; precious metal compounds; and carbides (excluding tungsten, boron, and chromium carbides).<sup>286</sup> Together, these three product groups accounted for 92.0 percent of U.S. imports of miscellaneous inorganic chemicals from SSA countries. South Africa, reportedly unique among AGOA-eligible countries in its ability to attract significant foreign investment in its chemical industry,<sup>287</sup> was the only source of U.S. imports of these products from SSA countries in 2016–18.

During 2016–18, virtually all imports of these three product groups claimed duty-free treatment under AGOA (including GSP). Virtually all U.S. imports of precious metal compounds (excluding compounds of gold or silver) and carbides (excluding tungsten, boron, and chromium), and more than 98 percent of imports of vanadium oxides from SSA during this timeframe, entered claiming preferences under either GSP or AGOA.<sup>288</sup>

**Table 3.13** Miscellaneous inorganic chemicals: U.S. imports under AGOA from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
		Million \$			%
Miscellaneous inorganic chemicals	109	113	204	95	36.8
Carbides	23	39	78	55	85.3
South Africa	23	39	78	55	85.3
Precious metal compounds	10	33	55	46	141.2
South Africa	10	33	55	46	141.2
Vanadium oxides	17	26	55	38	81.4
South Africa	17	26	55	38	81.4
All other products	59	15	16	-42	-47.5

Source: USITC DataWeb/USDOC (accessed July 1, 2019). All products in this table are in digest CH007. Carbides enter under HTS 2849.90.5000; precious metal compounds enter under HTS 2843.90.0000; and vanadium oxides enter under HTS 2825.30.0010 and 2825.30.0050.

Note: Due to rounding, figures may not add up to totals shown.

<sup>286</sup> Vanadium oxides and hydroxides are classified under HTS subheading 2825.30.00; precious metal compounds (excluding compounds of gold or silver) under HTS 2843.90.00; and carbides (excluding tungsten, boron, and chromium carbides) under 2849.90.50.

<sup>287</sup> USITC, hearing transcript, July 24, 2019, 184 (testimony of Anthony Carroll, Johns Hopkins University).

<sup>288</sup> Only a very small portion of U.S. imports from SSA entered at the NTR rate. In 2017, \$13,500 (0.04 percent) of U.S. imports of precious metal compounds from South Africa entered under the NTR rate of 3.7 percent. In 2016, \$926,000 (5.3 percent) of U.S. imports of vanadium oxides from South Africa entered under the NTR rate of 5.5 percent.

## Key Factors Affecting U.S. Imports, 2016–18

During 2016–18, U.S. imports of the three product groups described above increased in value and, in some cases, volume, as average unit values (AUVs) increased.<sup>289</sup> Vanadium oxides are tradeable forms of vanadium,<sup>290</sup> which is a key component in the production of strengthened steel. Since 2014, U.S. production of vanadium oxides has been limited to recycling them from vanadium-containing waste materials, leaving the United States largely dependent on imports and therefore subject to global market conditions.<sup>291</sup> Increased global demand for strengthened steel has driven up demand for vanadium, while global supplies are limited to a few countries,<sup>292</sup> and several former producers have stopped operations. Examples include the cessation of U.S. vanadium mining in 2014<sup>293</sup> and the closure of Highveld Steel & Vanadium of South Africa in 2015.<sup>294</sup> As a result, global prices for vanadium jumped—by one measure, they rose more than 700 percent from December 2015 to November 2018.<sup>295</sup> Higher prices for vanadium products drove the increase in the value of U.S. imports of vanadium oxides from South Africa in 2016–18 as import volumes decreased 13.8 percent, while AUVs increased 299.0 percent.<sup>296</sup>

In contrast to imports of vanadium, U.S. imports of precious metal compounds increased by both volume and value. Precious metal compounds are mainly used in making catalysts for use in applications such as the production of catalytic converters for automobile emission control and in bulk chemical and petrochemical production.<sup>297</sup> The increase in volume of U.S. imports of precious metal compounds was likely driven by the rising U.S. demand for automotive catalytic converters (see box 4.1 on catalytic converters in chapter 4) and increased production of petrochemicals.<sup>298</sup>

The global market for precious metal compounds has impacted the unit values of U.S. imports. Global demand for these compounds has risen as China and other countries have introduced stricter auto emission requirements, increasing the demand for catalytic converters. However, the global supply of precious metals palladium, rhodium, iridium, and ruthenium for use as inputs for precious metal

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<sup>289</sup> USITC DataWeb/USDOC (accessed September 24–October 18, 2019). Average unit value (AUV) is calculated by dividing the value of imports by their quantity.

<sup>290</sup> Bushveld Minerals, “Vanadium Overview” (accessed September 25, 2019).

<sup>291</sup> The U.S. Department of the Interior included vanadium on its 2018 list of critical minerals for which the United States is “heavily reliant on imports.” “Final List of Critical Minerals,” 83 Fed. Reg. 23295, May 18, 2018; Polyak, “Vanadium,” 2019.

<sup>292</sup> South Africa, China, and Russia account for roughly 85 percent of global vanadium supply. Mills, “Vanadium, the Metal We Can’t Do Without,” October 24, 2017.

<sup>293</sup> Polyak, “Vanadium,” 2019.

<sup>294</sup> Bushveld Minerals, “Vanadium Overview” (accessed September 25, 2019).

<sup>295</sup> Prices of ferrovandium, a related vanadium compound, increased from of \$13.50 per kilogram of ferrovandium in December 2015 to \$127 per kilogram of ferrovandium in November 2018. Bushveld Minerals, “Vanadium Overview” (accessed September 25, 2019).

<sup>296</sup> AUVs of imports from South Africa for this HTS category increased from \$12.2 in 2016 to \$48.7 in 2018. USITC DataWeb/USDOC (accessed September 25, 2019).

<sup>297</sup> Rowling, “Why Palladium’s Suddenly an Especially Precious Metal,” February 21, 2019.

<sup>298</sup> Nodar, “US Petrochemical Market Grapples with Tariffs,” January 30, 2019. Major U.S. catalyst producers include firms such as Albemarle, Axens, BASF, Clarion, Criterion, ExxonMobil, Grace, Johnson Matthey, and UOP.

compounds appears to lag this increased demand, resulting in global price increases for these metals.<sup>299</sup> As a result, from 2016 to 2018, the value of U.S. imports of precious metal compounds from South Africa increased more rapidly than the volume, with AUVs increasing by 82.1 percent.<sup>300</sup>

The value of U.S. imports of carbides imported under subheading 2849.90.50 of the Harmonized Tariff Schedule of the United States (HTS) was driven by increases in the AUVs for these products entering from South Africa. This subheading includes titanium carbide, which, due to its hardness and high melting temperature, is used for wear-resistant coatings in applications such as cutting tools and drill bits.<sup>301</sup> Each year during 2016–18, South Africa was the source of the majority of U.S. imports under this subheading. During this period, U.S. imports by volume decreased 13.8 percent, while AUVs increased by 298.4 percent.<sup>302</sup>

## Petroleum Products

Petroleum products are primarily derived from refining crude petroleum and include products such as gasoline, diesel, kerosene, asphalt, lubricating oils, and residual fuel oils, among others.

### Overview of U.S. Imports

The top U.S. petroleum product import from SSA under AGOA is heavy fuel oils (table 3.14). Heavy fuel oils include both heavy gas oil (an intermediate product derived from crude that is processed further at U.S. refineries equipped with secondary units) and residual fuel oils. Most other U.S. petroleum product imports from SSA under AGOA are light unfinished oils, such as motor gasoline blending components.<sup>303</sup>

**Table 3.14** Petroleum products: U.S. imports for consumption from SSA entering under AGOA or GSP

Product and source country	2016	2017	2018	Absolute change	Compound annual growth rate (CAGR)
				2016–18	2016–18
	Million \$				%
Petroleum products	239	353	320	81	15.6
Heavy fuel oils	18	37	104	86	139.9
Côte d’Ivoire	0	37	88	88	( <sup>a</sup> )
All other SSA	18	0	16	-2	-6.0
Other	221	316	216	-6	-1.3
Nigeria	196	295	165	-30	-8.1
All other SSA	26	21	50	25	39.9

Source: USITC DataWeb/USDOC (accessed July 23, 2019). All products are in digest EP05. Heavy fuel oils enter under HTS 2710.19.06, which covers distillate and residual fuel oils (including blended fuel oils) testing under 25 degrees API.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Unable to calculate.

<sup>299</sup> More information on precious metals is available in the “Precious Metals and Non-numismatic Coins” section of this chapter.

<sup>300</sup> AUVs of imports from South Africa for this HTS category increased from \$5,301 in 2016 to \$9,651 in 2018.

<sup>301</sup> Aydemir, “Titanium Carbide Powders and Applications,” November 20, 2018; University of the Witwatersrand, “Overview: Carbides and Cermets” (accessed September 25, 2019).

<sup>302</sup> AUVs of imports from South Africa for this HTS category increased from \$12.2 in 2016 to \$48.7 to 2018.

<sup>303</sup> EIA, “U.S. Imports by Country of Origin” (accessed August 29, 2019).

The value of U.S. petroleum product imports from SSA entering under AGOA (including GSP) increased by \$81 million dollars (a CAGR of 15.6 percent) from 2016 to 2018, rising to \$320 million. However, the volume of U.S. imports of these products actually declined by about 1.4 million barrels (a CAGR of -13.9 percent) from 2016 to 2018; the growth in import values was driven by increases in prices.<sup>304</sup> Overall U.S. petroleum product imports from SSA (including those not entering under AGOA) followed a similar pattern, increasing in value substantially but declining in terms of volume. This reflected the general trend for U.S. imports from the world.<sup>305</sup>

A relatively low share of the petroleum products imported from SSA enter under AGOA, likely due in part to the already low duty rates imposed under normal trade relations (NTR). Heavy fuel oils enter the United States at a duty rate of 5.25 cents per barrel under NTR, and most of the other petroleum products imported from SSA enter under a slightly higher NTR rate of 10.5 cents per barrel.<sup>306</sup> The share of U.S. petroleum product imports from SSA entering under AGOA declined slightly from 2016 to 2018, from about 27 percent to 25 percent.

## Key Factors Affecting U.S. Imports, 2016–18

The growth in U.S. petroleum product imports from SSA under AGOA was driven mainly by increased imports of heavy fuel oils from Côte d'Ivoire. In early 2017, Côte d'Ivoire's main refinery took its hydrocracker offline, removing its capability to process heavy gas oil into higher-value products such as gasoline and diesel.<sup>307</sup> The resulting surplus of heavy gas oil was likely the source of increased heavy fuel oil exports from Côte d'Ivoire in 2017 and 2018.<sup>308</sup> The hydrocracker is reportedly scheduled to restart in 2019, likely reducing the level of future U.S. imports of heavy fuel oils from Côte d'Ivoire.<sup>309</sup>

Overall U.S. imports of heavy fuel oils from SSA were relatively flat in terms of volume (growing by less than 1 percent from 2016 to 2018), with the rising volume of imports from Côte d'Ivoire offsetting reduced volumes of imports from Angola and Cameroon.<sup>310</sup> However, due to the price increases, the value of U.S. heavy fuel oil imports from SSA rose by \$273 million to \$628 million (a CAGR of 33.0 percent). Additionally, a larger share of U.S. heavy fuel oil imports from Côte d'Ivoire entered under

<sup>304</sup> Because petroleum products are derived from crude petroleum, their prices are closely linked. A few types of petroleum products are measured in kilograms rather than barrels, but U.S. imports of these products from SSA entering under AGOA or GSP fell to zero in 2018. USITC DataWeb/USDOC, HTS subheadings 2710.12.15, 2710.12.25, 2710.12.45, 2710.12.90, 2710.19.06, 2710.19.11, 2710.19.40, and 2710.19.45 (accessed August 16, 2019).

<sup>305</sup> Overall U.S. imports of petroleum products declined by about 7 million barrels (1 percent) from 2016 to 2018. These figures exclude import data for hydrocarbon gas liquids, fuel ethanol, and biodiesel. EIA, "U.S. Imports by Country of Origin" (accessed September 24, 2019).

<sup>306</sup> These NTR rates averaged less than 0.2 percent ad valorem for U.S. petroleum product imports from SSA between 2016 and 2018. USITC DataWeb/USDOC (accessed September 24, 2019).

<sup>307</sup> Turner, "Refinery News Roundup," March 27, 2018; EIA, "Hydrocracking Is an Important Source," January 18, 2013.

<sup>308</sup> U.S. imports of heavy fuel oils from Côte d'Ivoire grew in volume from 0.2 million barrels in 2016 to 3.1 million barrels in 2018 (a CAGR of 286 percent). The value of these imports grew at an even faster rate, due to price increases: from \$11 million in 2016 (none of which entered under AGOA) to \$244 million in 2018 (a CAGR of 363 percent). USITC DataWeb/USDOC, HTS subheading 2710.19.06 (accessed August 29, 2019).

<sup>309</sup> Turner, "Refinery News Roundup," March 27, 2018.

<sup>310</sup> USITC DataWeb/USDOC, HTS subheading 2710.19.06 (accessed August 29, 2019).

AGOA, compared to heavy fuel oil imports from other SSA countries. Consequently, AGOA utilization rates for these imports from SSA more than tripled, and heavy fuel oil imports entering under AGOA increased in value at a CAGR of nearly 140 percent (table 3.14).

## Edible Nuts

The edible nuts category includes peanuts (groundnuts) as well as tree nuts, such as cashews, macadamia nuts, almonds, and walnuts. Edible nuts can be sold in-shell or shelled (removed from their shells).

### Overview of U.S. Imports

The value of U.S. nut imports from SSA countries under AGOA increased from 2016 to 2018, from \$99 million to \$163 million, a CAGR of 28.2 percent (table 3.15). This increase was largely led by increases in imports of macadamia nuts, which make up more than 85 percent of U.S. imports of edible nuts under AGOA from SSA countries.<sup>311</sup> U.S. imports of shelled macadamia nuts under AGOA increased 64.5 percent during 2016–18 by value and 39.7 percent by quantity.<sup>312</sup>

The most significant sources of U.S. imports from SSA countries of macadamia nuts under AGOA are South Africa and Kenya, which each supply almost equal amounts by value (table 3.15). Imports of macadamia nuts from these countries are a significant portion of total U.S. imports of macadamia nuts from the world: South Africa and Kenya each account for about 35 percent of total U.S. imports of macadamia nuts, from all sources.<sup>313</sup>

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<sup>311</sup> Cashews are another important edible nut export from SSA countries, second to macadamia nuts. In 2018, U.S. imports of macadamia nuts from SSA countries were twice the value of imports of cashews. However, cashews are not covered here: since cashews from all sources enter the United States duty free, no cashews enter the United States under AGOA preferences. USITC DataWeb/USDOC (accessed July 1, 2019).

<sup>312</sup> Imports of shelled macadamia nuts from Kenya and South Africa through AGOA make up around 95 percent or more of total U.S. imports of these products from each country during this period. USITC DataWeb/USDOC (accessed August 15, 2019).

<sup>313</sup> USITC DataWeb/USDOC (accessed August 15, 2019).

**Table 3.15** Edible nuts: U.S. imports under AGOA from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
	Million \$				%
Edible nuts	99	125	163	64	28.2
Macadamia nuts, shelled	86	108	141	55	28.2
Kenya	37	52	64	28	32.2
South Africa	42	49	67	24	25.5
Malawi	6	7	9	3	19.1
All other SSA	<sup>(a)</sup>	<sup>(a)</sup>	1	1	74.0
Other	13	17	22	8	27.8

Source: USITC DataWeb/USDOC (accessed July 2, 2019).

Note: Shelled macadamia nuts are found in digest AG020 and enter under HTS 0802.62.0000. Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

## Key Factors Affecting U.S. Imports, 2016–18

The United States is the world’s largest importer of macadamia nuts, accounting for nearly 30 percent of global imports and one quarter of global consumption, and is followed by the EU and China.<sup>314</sup> The increase in U.S. imports of macadamia nuts from SSA countries is part of an overall trend of rising imports of these and all nuts globally, as nut consumption is increasingly seen to be an important part of healthy diets.<sup>315</sup>

Although U.S. production of macadamia nuts has declined slightly over the last 30 years, the U.S. share of global production has dropped significantly, falling to less than 10 percent in 2018.<sup>316</sup> U.S. imports of macadamia nuts increased not only from SSA countries but also from most other foreign suppliers, with total U.S. imports of macadamia nuts rising from \$112 million in 2016 to \$190 million in 2018, a CAGR of 30.1 percent.<sup>317</sup> U.S. imports of macadamia nuts accounted for nearly 80 percent of U.S. consumption.<sup>318</sup>

Increased production of macadamia nuts in South Africa and Kenya also likely contributed to rising U.S. imports of such products from SSA. South Africa is the world’s largest producer of macadamia nuts, accounting for more than one-quarter of global production in 2018; it is followed closely by Australia, which accounts for one-quarter of production.<sup>319</sup> South Africa’s production increased from 10,640 metric tons in 2016 to 16,965 metric tons in 2018 and is expected to double over the next five years as

<sup>314</sup> INC, *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019, 32–33.

<sup>315</sup> CBI, “Exporting Macadamia Nuts to Europe” (accessed October 25, 2019); Bell, “Macadamia Nuts Double in Price,” March 10, 2019; Green & Gold Macadamias, “Macadamias—The Ultimate Healthy Fat,” June 12, 2018.

<sup>316</sup> U.S. production over the last 30 years has ranged from about 18,000 to 26,000 metric tons, in-shell. In 2018, the U.S. share of global production was 7 percent; in 1991/92, it was nearly 60 percent. USDA, ERS, *Fruit and Tree Nut Yearbook Tables*, table F-12, “Macadamias,” October 31, 2018; INC, *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019, 30; USITC, *Macadamia Nuts*, November 1992, ix.

<sup>317</sup> USITC DataWeb/USDOC (accessed August 15, 2019).

<sup>318</sup> INC, *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019, 32–33.

<sup>319</sup> INC, *NutFruit Magazine*, November 2017, 72; INC, *NutFruit Magazine*, November 2018, 70; INC, *NutFruit Magazine*, July 2019, 70.

macadamia nut acreage continues to expand.<sup>320</sup> South Africa's industry has been investing in processing as well to allow for more exports of shelled products. Indeed, it has become a regional hub for processing, importing macadamia nuts from Malawi as well as other members of the Southern African Development Community.<sup>321</sup>

Kenya is the world's third-largest producer, after Australia, and in 2018 produced 7,750 metric tons, or 13 percent of global production 2018.<sup>322</sup> Kenya's government is investing in improved macadamia nut varieties, replacing trees to increase yields and quality.<sup>323</sup> In fact, Kenya has banned the export of in-shell macadamia nuts since 2009, reportedly in an attempt to build its nut processing industry.<sup>324</sup> Some suggest that this has impeded the country's growth as an exporter of macadamia nuts in the short term, but that it has successfully built capacity that will support overall growth of the sector over time.<sup>325</sup>

The rise in macadamia nut demand has been influenced by a number of factors. The first is a general rise in U.S. and global demand for nuts, including macadamia nuts. In response to growing demand, global macadamia nut supply increased by over 50 percent from 2013 to 2018, and it is expected to nearly double from its 2018 level by 2023 as all producing markets expand plantings.<sup>326</sup> The increase in the supply of macadamia nuts has encouraged more consumption and has also stimulated more use of macadamia nuts in products such as nut mixes and macadamia nut milk, as well as in relatively unprocessed form on retail shelves.<sup>327</sup> As a result, demand in the United States and globally continues to increase, keeping pace with supply increases.<sup>328</sup> The upshot is that unlike many other nuts that have seen their prices decline, macadamia nut prices are currently at all-time highs.<sup>329</sup>

## U.S. Imports of Services from Africa

This section discusses major factors that have led to growth in U.S. imports of certain services—travel, financial, and air transport services—from SSA countries.<sup>330</sup> The Bureau of Economic Analysis (BEA) of

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<sup>320</sup> INC, *NutFruit Magazine*, November 2017, 72; INC, *NutFruit Magazine*, November 2018, 70; INC, *NutFruit Magazine*, July 2019, 70; INC, "Macadamia Roundtable," 2018, 8.

<sup>321</sup> Brits, "World's Largest Macadamia Factory Opened," March 28, 2018; Gutierrez, "Strong South African Macadamia Crop," March 5, 2019.

<sup>322</sup> INC, *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019, 30.

<sup>323</sup> Gale, "Kenya Takes Steps to Raise Profile of Nuts," July 25, 2019.

<sup>324</sup> USDA, FAS, *Kenya: Tree Nuts Annual; Kenya Macadamia Annual Report*, October 1, 2009, 1; industry representative, telephone interview by USITC staff, October 22, 2019.

<sup>325</sup> Industry representative, telephone interview by USITC staff, October 22, 2019.

<sup>326</sup> INC, *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019, 30; Gale, "Green & Gold Macadamias Partners with Camellia Group," February 28, 2019.

<sup>327</sup> Industry representative, telephone interview by USITC staff, October 22, 2019.

<sup>328</sup> Gale, "Macadamia Kernels Remain Scarce," June 21, 2018; Gale, "Macadamia Supply Is Falling Behind," July 6, 2017; Green Farms Nut Company, "Planning for the Long Game," September 2018; INC, *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019, 33; *South Coast Herald*, "Nuts for Nuts," July 17, 2018.

<sup>329</sup> USDA, NASS, "Hawaii Macadamia Nuts," July 12, 2017; GTA, "Latest News: Macadamia," May 16, 2019; Gale, "Growth in 2019 Macadamia Supply," June 3, 2019; industry representative, interview by USITC staff, October 23, 2019.

<sup>330</sup> U.S. imports of financial, air transport, and travel services accounted for 64.7 percent of total U.S. private services imports from Africa in 2018. U.S. imports of travel services grew the most from 2016 to 2018, followed by technical, trade-related, and other business services; research and development services; and professional and

the U.S. Department of Commerce publishes limited data on U.S. services imports from Nigeria and South Africa, as well as from all of Africa (which includes both SSA and North Africa as well as outlying islands). However, disaggregated data for other SSA countries and for the SSA region as a whole are not available.<sup>331</sup>

U.S. imports of private services from all African countries increased at a CAGR of 11.4 percent during 2016–18, from \$8.1 billion to \$10 billion.<sup>332</sup> In 2018, the sectors with the largest shares of U.S. private services (which excludes government-provided services) imported from Africa were travel services (48.4 percent), air transport services (13.0 percent) and technical, trade-related, and other business services (13.0 percent). In both value and percentage terms, the fastest-growing categories of U.S. services imports during 2016–18 were research and development services; technical, trade-related, and other business services; financial services; and travel services. (These services exclude government-provided services.) (table 3.16). The factors driving growth of imports in three services sectors—financial, travel, and air transport—are discussed below.

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management consulting services. However, the technical, trade-related, and other business services; and professional and management consulting services are broad categories composed of a diverse array of smaller sub-categories while research and development services occur in a variety of sectors for which limited data are available.

<sup>331</sup> BEA publishes data on U.S. cross-border services trade with Africa as a whole, but does not publish data on such trade with the SSA region. BEA data cover SSA as a whole plus North Africa, including Egypt, Libya, Algeria, Morocco, Tunisia, and Western Sahara; and some outlying islands. See USDOC, BEA, “Geographic Area Definitions” (accessed August 8, 2019).

<sup>332</sup> For more information on U.S. trade in services with SSA, please see USITC, “The Sub-Saharan African Services Economy,” 2017.

**Table 3.16** U.S. imports of private services from Africa by service category, 2016–18

Sector	2016	2017	2018	Absolute	Compound annual	
				change	growth rate (CAGR)	
				2016–18	2016–18	
	Million \$					%
Travel (for all purposes including education)	4,036	4,444	4,868	832		9.8
Technical, trade-related, and other business services	993	1,188	1,305	312		14.6
Research and development services	424	665	638	214		22.7
Professional and management consulting services	697	726	828	131		9.0
Air transport	1,213	1,232	1,311	98		4.0
Financial services	246	345	320	74		14.1
Telecommunications, computer, and information services	209	204	216	7		1.7
Insurance services	47	42	49	2		2.1
Maintenance and repair services n.i.e.	6	7	7	1		8.0
Other modes of transport	3	2	3	0		0.0
Charges for the use of intellectual property n.i.e.	45	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )		( <sup>b</sup> )
<b>Total private services imports</b>	<b>8,103</b>	<b>9,098</b>	<b>10,050</b>	<b>1,947</b>		<b>11.4</b>

Source: USDOC, BEA, International Services Tables, table 2.3 (October 15, 2019).

Note: N.i.e. = not included elsewhere.

<sup>a</sup> The BEA suppresses these country-specific import data to avoid disclosing individual company data.

<sup>b</sup> Absolute change and CAGR not provided due to suppressed data.

Approximately corresponding to the international category “trade through commercial presence,”<sup>333</sup> U.S. purchases of services from African-owned affiliates are very small, totaling \$253 million in 2017 (the latest year for which information was available). This came to less than 0.5 percent of the total services supplied to U.S. persons that year by all foreign-owned affiliates of multinational enterprises (MNEs).<sup>334</sup> Among the African-owned affiliates, South Africa supplied 38.3 percent of these sales with \$97 million, and Nigeria accounted for 2.0 percent or \$5 million in 2017.<sup>335</sup> More information on U.S. foreign direct investment in SSA and the operations of U.S.-owned affiliates in that region can be found in chapter 4 of this report.

As data on bilateral services trade between the U.S. and SSA are sparse, the analysis in this section also presents World Trade Organization (WTO) data on total world imports of services from SSA.<sup>336</sup> These

<sup>333</sup> The General Agreement on Trade in Services (GATS) identifies four ways that services are traded, or “modes of supply.” Commercial presence (mode 3) roughly corresponds to “affiliate transactions.” For more information on modes of supply, see USITC, *Recent Trends in U.S. Services Trade: 2019*, 2019, 16, box 1.1.

<sup>334</sup> According to BEA, affiliate transactions data reflect “services supplied by majority-owned affiliates of multinational enterprises (MNEs) through the channel of direct investment,” which relates these transactions to foreign direct investment stock and flows. Total services supplied to U.S. persons by foreign MNEs reported by BEA include services related to mining and manufacturing. USDOC, BEA, “Definition of International Services” (accessed August 1, 2019).

<sup>335</sup> USDOC, BEA, International Services Tables, table 5.4 (accessed October 15, 2019).

<sup>336</sup> This total does not include world imports from the Central African Republic, Chad, Comoros, Equatorial Guinea, or Gabon, as data on world imports from those countries are unavailable for 2015–17.

data indicate that world imports of commercial services from SSA increased from \$55.0 billion in 2015 to \$58.8 billion in 2017 (the latest year of comprehensive data available), posting an overall CAGR of 3.4 percent during the period (table 3.17).<sup>337</sup> South Africa was the source of the largest share of such imports in 2017 with 26.2 percent, followed by Ghana (11.0 percent) and Nigeria (7.7 percent).<sup>338</sup> Between 2015 and 2017, world imports of commercial services from Nigeria experienced the most growth in value and percentage terms of any SSA country, increasing by \$1.8 billion and 28.8 percent. During that time, travel services was the fastest-growing sector of world commercial services imports from the key SSA markets, particularly to Nigeria (up 147.9 percent) and Côte d'Ivoire (up 58.3 percent).<sup>339</sup>

**Table 3.17** World imports of private services from key SSA markets, 2015–17<sup>a</sup>

Country	2015	2016	2017	Absolute change 2015–17	Compound annual growth rate (CAGR) 2015–17
		Million \$			%
South Africa	14,662	13,974	15,376	714	2.4
Ghana	6,013	6,260	6,470	457	3.7
Nigeria	2,739	3,241	4,541	1,802	28.8
Kenya	3,709	3,358	3,785	76	1.0
Ethiopia	2,937	2,755	3,264	327	5.4
Côte d'Ivoire	643	789	869	226	16.3
Rwanda	567	574	729	162	13.4
All other SSA	23,708	22,794	23,716	8	0.0
Total SSA <sup>b</sup>	54,978	53,745	58,750	3,772	3.4

Source: WTO, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed August 12, 2019).

<sup>a</sup> 2017 is the latest year for which data are available for most key SSA markets. WTO reports these data as individual SSA countries' commercial services imports from the world. The term "commercial services," as used in the WTO services trade data, is roughly equivalent to the term "private services" used in BEA services trade data.

<sup>b</sup> This total does not include world imports from the Central African Republic, Chad, Comoros, Equatorial Guinea, or Gabon, as data on world imports from those countries are unavailable for 2015–17.

## Financial Services

Financial services include brokerage, underwriting, credit card, financial management, advisory and custody, securities lending, and electronic funds transfer services. Facilitating business in a broad range of sectors and typically provided by banks, these services enable monetary transactions and allocate capital.

<sup>337</sup> WTO reports these data as individual SSA countries' commercial services exports to the world. The term "commercial services," as used in the WTO services trade data, is roughly equivalent to the term "private services" used in BEA services trade data. Like the BEA cross-border trade data, the WTO cross-border trade data roughly correspond to modes 1, 2, and 4 specified in GATS. WTO, Statistics Database, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed August 12, 2019).

<sup>338</sup> WTO, Statistics Database, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed August 12, 2019).

<sup>339</sup> WTO, Statistics Database, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed August 12, 2019).

## Overview of U.S. Imports

BEA data indicate that U.S. imports of financial services from Africa as a whole are small, comprising only 1.0 percent of total U.S. imports of financial services in 2018. However, U.S. financial services imports from Africa have grown quickly in recent years, increasing at a rate of 14.1 percent from \$246 million in 2016 to \$320 million in 2018. Comparatively, total U.S. financial services imports grew at a rate of 10.3 percent between 2016 and 2018. South Africa accounted for 36.3 percent (\$116 million) of U.S. financial services imports from SSA in 2018, and Nigeria accounted for 9.7 percent (\$31 million) (table 3.18).<sup>340</sup>

**Table 3.18** Financial services: U.S. imports from Africa and selected SSA countries, 2016–18

Source Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
	Million \$				2016–18
					%
Africa	246	345	320	74	14.1
South Africa	86	110	116	30	16.1
Nigeria	26	23	31	5	9.2
All other	134	212	173	39	13.6

Source: USDOC, BEA, International Services Tables, table 2.3 (October 15, 2019).

U.S. purchases from African-owned financial services affiliates are very small but rapidly growing, having increased from \$11 million in 2015 to \$21 million in 2017 (the latest year available).<sup>341</sup> In 2017, \$16 million or 76.2 percent of U.S. purchases from African-owned financial services affiliates were from finance firms that are not depository institutions.<sup>342</sup> Data on affiliate purchases from South Africa are only available for the combined financial services and insurance services category;<sup>343</sup> however, as U.S. affiliate purchases from all African-owned insurance affiliates were zero throughout 2015–17, purchases recorded in this combined category must solely reflect purchases from financial services affiliates. In 2017, U.S. purchases of services from South African-owned financial services affiliates totaled \$12 million.<sup>344</sup>

## Key Factors Affecting U.S. Imports, 2016–18

As U.S. financial services imports typically occur through partnerships with local financial institutions, the recent development and increasing maturity of SSA financial services markets may boost U.S. imports from the region. Recent FDI growth in SSA is also supporting the development of the region's financial sector and increasing U.S. demand for financial services from local SSA institutions. While

<sup>340</sup> WTO, Statistics Database, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed August 12, 2019).

<sup>341</sup> Affiliate transactions and cross-border imports are not directly comparable, as they are calculated differently. However, in general, U.S. purchases of financial services from SSA-owned firms operating in the United States are significantly larger than U.S. imports of these services. USDOC, BEA, International Services Tables, table 5.4 (accessed October 15, 2019).

<sup>342</sup> USDOC, BEA, International Services Tables, table 5.4 (accessed October 15, 2019).

<sup>343</sup> USDOC, BEA, International Services Tables, table 5.4 (accessed October 15, 2019).

<sup>344</sup> BEA suppresses Nigerian data to avoid disclosing individual company data. USDOC, BEA, International Services Tables, table 5.4 (accessed October 15, 2019).

advanced economies are experiencing a global slowdown, according to one source African banking markets are almost twice as profitable as the global average.<sup>345</sup> For this reason, many investors see SSA as the “final frontier,” with FDI flows to SSA rising by 13 percent to \$32 billion in 2018.<sup>346</sup> This increased investment activity may result in growing demand for SSA financial services by U.S. firms.<sup>347</sup>

## Air Transport Services

Air transport services include passenger transport, freight transport, and airport services. The United States imports air passenger transport services when foreign airlines transport U.S. residents to and from the United States or between two foreign countries. U.S. imports of air freight services occur when foreign airlines transport U.S. goods between the United States and foreign countries or between two foreign ports. U.S. imports of airport services encompass the value of goods and services—such as aircraft handling and terminal services, among others—procured by U.S. airlines at foreign airports.<sup>348</sup>

### Overview of U.S. Imports

U.S. cross-border imports of air transport services from all of Africa totaled \$1.3 billion in 2018. South Africa and Nigeria—the only two SSA countries for which BEA provides discrete data on U.S. cross-border services trade—respectively accounted for 18.1 percent (\$237 billion) and 2.6 percent (\$34 billion) of total U.S. imports of air transportation services from Africa in that year (table 3.19). Passenger transport makes up the majority of U.S. air transport services imports from Africa (70.8 percent in 2018), followed by airport services (18.6 percent) and air freight transport (10.5 percent).

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<sup>345</sup> Chironga et al., “Roaring to Life: Growth and Innovation,” February 2018, 6.

<sup>346</sup> UNCTAD, *World Investment Report 2019: Special Economic Zones*, 2019, 37.

<sup>347</sup> Alfaro et al., “FDI and Economic Growth: The Role of Local Financial Markets,” October 2004; Bayer and Gavriletea, “Foreign Direct Investment Inflows and Financial Development,” May 2018; Krueger, “Financial Markets and Economic Growth,” September 29, 2006.

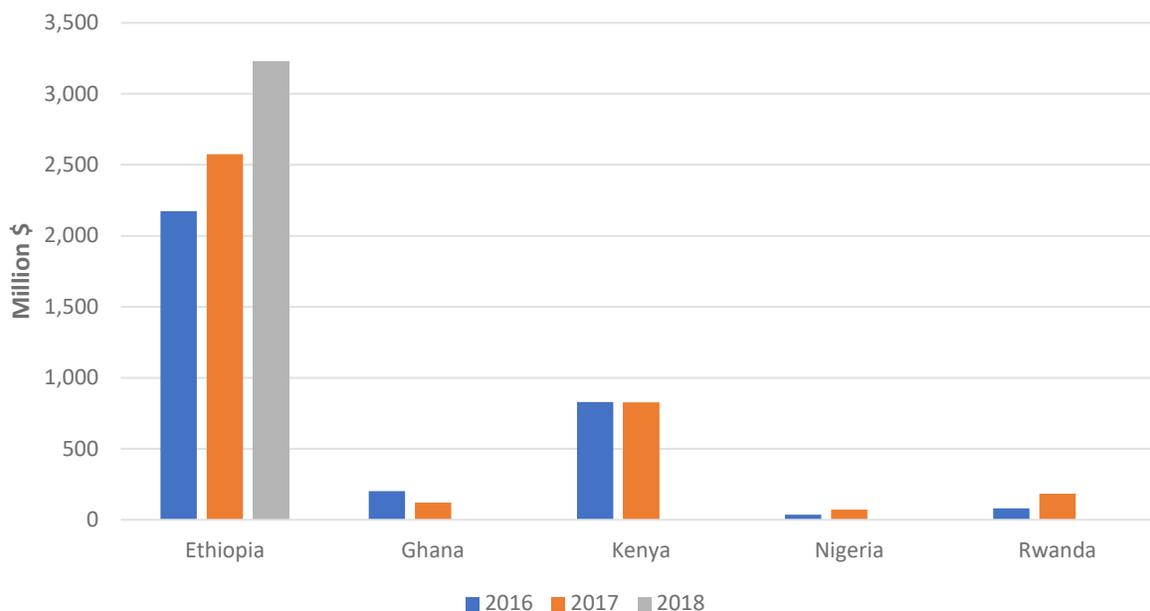
<sup>348</sup> USDOC, BEA, *NIPA Handbook: Concepts and Methods*, November 2017.

**Table 3.19** U.S. imports of air transport services by sector from selected SSA countries, 2016–18

Sector and Source Country	2016	2017	2018	Absolute change	Compound annual growth
				2016–18	rate (CAGR) 2016–18
				Million \$	%
Total air transport					
Africa	1,213	1,232	1,311	98	4.0
Nigeria	30	32	34	4	6.5
South Africa	249	244	237	-12	-2.4
Passenger					
Africa	849	859	928	79	4.5
Nigeria	11	12	13	2	8.7
South Africa	183	179	173	-10	-2.8
Freight					
Africa	107	121	138	31	13.6
Nigeria	2	2	2	0	0.0
South Africa	3	4	4	1	15.5
Port					
Africa	257	251	244	-13	-2.6
Nigeria	18	18	19	1	2.7
South Africa	63	61	59	-4	-3.2

Source: USDOC, BEA, International Services Tables, table 2.2 (October 15, 2019).

WTO data for 2018 are still incomplete, with data available only for Africa as a whole and for Ethiopia at the country level. However, some trends are discernable. World imports from Africa increased from \$9 billion in 2016 to almost \$12 billion in 2018, driven by rising imports from Ethiopia as well as smaller increases in Nigeria and Rwanda (figure 3.1). Others experienced a fall; for example, imports from Ghana dropped from \$203 million in 2016 to \$122 million in 2017.

**Figure 3.1** World imports of air transportation services from select SSA countries, 2016–18

Source: WTO, Statistics Database, Time Series on International Trade, “Trade in Commercial Services, 2005–onward” (accessed September 23, 2019).

Note: Data for Ghana, Kenya, Nigeria, and Rwanda were not available for 2018. See appendix table I.3 for a tabular presentation of the data in this figure.

## Key Factors Affecting U.S. Imports, 2016–18

Growth in U.S. imports of air transport services was principally driven by growth in imports of passenger transport services which, in turn, was likely tied to the growth in U.S. travel services imports from SSA during the period. SSA airlines are well positioned to take advantage of this travel-related increase in U.S. demand for air passenger services, as they offer a number of direct flights between SSA and the United States and fly most routes between SSA countries. While most flights between the United States and SSA include layovers in third countries (primarily in Europe), SSA-based airlines South African Airways, Ethiopian Airlines, Kenyan Airways, and Cabo Verde Airlines offer direct flights to and from the United States,<sup>349</sup> and many flights within the region are operated by local partners.

U.S. imports of airport services from SSA fell slightly during 2016–18. This is potentially due to growing competition from U.S. airlines providing direct flights to SSA countries, as described in chapter 2.

## Travel Services

Data on trade in travel services reflect foreign residents’ purchases of goods and services—such as food and lodging—while traveling abroad for personal, business, health, and education purposes. A U.S. resident’s expenditures while visiting a foreign country are therefore considered U.S. imports of travel services. Travel services make up a large share of total U.S. services trade with SSA, and U.S. travel

<sup>349</sup> Zijlma, “How to Fly Direct from the USA,” May 5, 2019.

services imports from SSA have grown steadily in recent years. Available data suggest that South Africa and Nigeria are important sources of U.S. travel imports from SSA.<sup>350</sup>

## Overview of U.S. Imports

Travel services account for almost half (45.0 percent) of all U.S. cross-border services imports from Africa. During 2016–18, U.S. imports of travel services from Africa rose from \$4.0 billion to \$4.9 billion.<sup>351</sup> South Africa accounted for 21.4 percent (or \$1.0 billion) of total U.S. travel imports from Africa in 2018, while Nigeria accounted for 3.8 percent (or \$185 million) (table 3.20). According to data from the U.S. Department of Commerce’s National Travel and Tourism Office, South Africa was the top destination country in SSA for U.S. travelers in 2017 (with 307,000 arrivals), and ranked 43rd among worldwide destinations. This represents a 9 percent increase in the number of U.S. travelers to the country from 2016.<sup>352</sup> This is likely due, in part, to South Africa’s more highly developed tourism infrastructure, which offers travelers a wider range of accommodations and activities than in other SSA countries.

**Table 3.20** Imports of travel services from Africa and selected countries, 2016–18

Source Country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR) 2016–18
	Million \$				%
Africa	4,036	4,444	4,868	832	9.8
South Africa	829	936	1,041	212	12.1
Nigeria	187	159	185	-2	-0.5
All other Africa	3,020	3,349	3,462	622	9.8

Source: USDOC, BEA, International Services Tables, table 2.2 (accessed August 26, 2019).

Data published by the African Development Bank on tourist arrivals also indicate that, while European countries are the largest source of foreign tourists traveling to many SSA countries (largely due to colonial ties and the shorter distance between Europe and Africa), the United States historically has been the largest source of extra-regional foreign tourists traveling to Ethiopia, Ghana, and Rwanda.<sup>353</sup> Interestingly, developing countries represent a growing source of tourists to Africa. In particular, tourist arrivals from China have increased rapidly in recent years, likely due to strengthening ties and more direct flights between that country and SSA.<sup>354</sup>

## Key Factors Affecting U.S. Imports, 2016–18

In recent years, SSA countries have developed increasingly sophisticated tourism marketing campaigns to promote the region’s natural and cultural attractions to potential foreign visitors, improving the

<sup>350</sup> USDOC, BEA, International Services Tables, table 2.2.

<sup>351</sup> USDOC, BEA, International Services Tables, table 2.2.

<sup>352</sup> USDOC, ITA, National Travel and Tourism Office, 2017 Top Destinations Visited by U.S. Resident Travelers 2016–2017 (accessed September 23, 2019).

<sup>353</sup> AfDB, *Africa Tourism Monitor: Unlocking Africa’s Tourism Potential*, October 2015.

<sup>354</sup> Butcher, Yuan, and Uppuluri, “China’s Outward Foreign Direct Investment in Sub-Saharan Africa,” July 2019.

effectiveness of their tourism marketing and branding.<sup>355</sup> Social media is an increasingly important tool for communication, with Instagram and Twitter accounts promoting tourism to the region to U.S. audiences. For example, South Africa collaborates with “influencers” through its @visitsouthafrica account in order to promote tourism in its country.<sup>356</sup>

Although U.S. imports of travel services from Africa are increasing, they still are small compared to U.S. imports from other regions.<sup>357</sup> This can be attributed to a combination of factors. Tourism infrastructure in SSA is relatively underdeveloped,<sup>358</sup> which has led to higher travel and accommodation costs. Flights to South Africa cost approximately 50 percent more than flights of comparable length to other overseas destinations (like Asia).<sup>359</sup> Costs for activities—such as safaris—are approximately 38 percent higher than comparable activities in Latin America.<sup>360</sup> Political instability and other security risks are also key concerns. As of February 2020, the U.S. State Department’s Bureau of Consular Affairs had posted higher level travel advisories for at least 12 SSA countries.<sup>361</sup> Visa fees and travel-related bureaucracy also impose costs on travelers. While 16 countries in SSA grant visas to U.S. passport holders on arrival, the official cost of a tourist visa on arrival can be \$100 or higher in some countries, such as Tanzania (\$100) and Nigeria (\$180).<sup>362</sup>

U.S. imports of travel services from SSA will likely rise in coming years. The United Nations World Tourism Organization expects overall visitor arrivals in SSA to continue to grow, and the U.S. share of those arrivals has been relatively stable,<sup>363</sup> suggesting future growth in U.S. imports of travel services. Further, SSA destinations are working to improve infrastructure and increase their integration into the online travel market.<sup>364</sup> Also, as mentioned earlier in the chapter, more direct flights are being offered between the United States and SSA by both U.S. and African airlines. While underdeveloped infrastructure and political instability may continue to pose a challenge for future growth in U.S. travel to SSA, increasing economic development in the region may address some of these issues.

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<sup>355</sup> Christie et al., “Tourism in Africa,” 2013, 48.

<sup>356</sup> Alfonso, “South African Tourism Launches ‘Choose Your Adventure,’” March 28, 2019.

<sup>357</sup> USDOC, BEA, International Services Tables, table 2.3 (accessed September 23, 2019).

<sup>358</sup> For example, South Africa ranked 53rd out of 136 countries on the World Economic Forum’s Global Travel and Tourism Competitiveness Index in 2017, which rates markets based on tourism-related regulation, business conditions, and human capital. South Africa had the highest ranking among SSA countries on the index, with five other SSA countries ranked in the middle third. WEF, *The Travel and Tourism Competitiveness Report 2017*, April 5, 2017, 45.

<sup>359</sup> Fares within SSA are also comparatively expensive. This factor, coupled with poor road quality and lack of rail transport, leads to limited intra-regional travel as well. World Bank, *Tourism in Africa*, 2015.

<sup>360</sup> In part this is due to costlier accommodations. Christie et al., “Tourism in Africa,” 2013, 48.

<sup>361</sup> These 12 SA countries had travel advisories at level 3 or 4. Level 3 indicates “Reconsider Travel,” while level 4 indicates “Do Not Travel.” USDOC, Bureau of Consular Affairs, “Travel Advisories” (accessed February 18, 2020).

<sup>362</sup> Though South Africa offers a free visa on arrival to U.S. travelers. Embassy of Nigeria, “Nigeria Online Visa Application Requirements and Procedures” (accessed September 30, 2019); Government of Tanzania, Ministry of Home Affairs, “Entry Requirements and Visa Information” (accessed September 30, 2019).

<sup>363</sup> UNWTO, *World Tourism Barometer*, September 26, 2016, 15.

<sup>364</sup> AfDB, *Africa Tourism Monitor: Unlocking Africa’s Tourism Potential*, October 2015, 14.



# Chapter 4

## Global Value Chains and Foreign Direct Investment in SSA

### Introduction

The strong linkage between global value chains (GVCs), foreign direct investment (FDI), and international trade is one of the main features of globalization. A value chain is defined as the “full range of activities that firms and workers do to bring a product from its conception to its end use and beyond, such as design, production, marketing, distribution, and support to the final consumer.” When these value chain activities are carried out in an inter-firm network on a global scale through FDI, trade, and non-equity, contract-based partnerships, this network of activities is called a GVC.<sup>365</sup>

Firms increasingly organize their production globally by combining trade and FDI, in addition to non-equity, contract-based partnerships. Multinational enterprises (MNEs) are the central and dominant actors behind such linkages.<sup>366</sup> They serve as the backbone of GVCs by linking and coordinating international production networks, while channeling the movement of capital, goods, services, and knowledge across countries.<sup>367</sup> Currently, about 70 percent of international trade is mediated by GVCs, such that exports from one country to another often involve complex interactions between multiple domestic and foreign suppliers.<sup>368</sup> A country’s participation in GVCs also increases and can be enhanced by its capacity to attract FDI.<sup>369</sup>

To provide a better understanding of U.S. trade and investment with sub-Saharan Africa (SSA), especially in the context of GVCs, this chapter covers U.S. FDI in SSA and U.S. integration in GVCs in SSA. The first section of the chapter presents an overview of SSA’s participation in GVCs. It also identifies the key SSA countries that play an important role in GVCs and the key sectors that have relatively strong GVC integration in SSA. The second section describes the macroeconomic and policy environment that affects trade, FDI, and GVC participation, as well as the associated economic benefits to SSA. The third section presents an overview of U.S. FDI in SSA from 2016 to 2018, and examines the leading market destinations and sectors for U.S. investment. Specifically, it examines the largest sectors for U.S. outward FDI, in terms of total position (investment stock) and number of projects, and discusses, when possible, factors influencing potential future growth in these sectors. The fourth section presents three case studies on U.S. firms’ integration with key GVCs in SSA (motor vehicle manufacturing, petroleum and natural gas extraction, and agrifood processing), which are selected because of their relative

<sup>365</sup> Gereffi and Fernandez-Stark, *Global Value Chain Analysis: A Primer*, May 31, 2011, 4.

<sup>366</sup> Andrenelli et al., “Micro-Evidence on Corporate Relationships in Global Value Chains: The Role of Trade, FDI and Strategic Partnerships,” April 25, 2019.

<sup>367</sup> OECD, “Measuring International Investment by Multinational Enterprises,” 2015.

<sup>368</sup> OECD, “The Trade Policy Implications of Global Value Chains” (accessed January 24, 2020).

<sup>369</sup> Buelens and Tirpák, “Reading the Footprints: How Foreign Investors Shape,” May 2017.

importance to SSA economies and the strong presence of U.S. participation in these value chains, as well as the large potential for deepening U.S. firms' integration.

## Key Findings

SSA does not play a big role in GVCs, and there is potential for its existing value chains to be more integrated regionally and globally. The majority of SSA's GVC participation is in the form of providing raw materials and primary inputs (e.g., crude petroleum, agricultural products, ores, or base metals) to other countries for downstream processing and export production. SSA's GVC participation is most integrated with Europe, and to a lesser degree, with Asia and North America (including the United States). South Africa, Nigeria, and Angola accounted for the largest shares of GVC-related trade in SSA in 2018. Mining (including petroleum and natural gas extraction) topped SSA's GVC participation in absolute value terms. Transportation equipment (including motor vehicles) topped SSA's participation in GVCs incorporating the highest share of foreign inputs, while agriculture and agribusiness can potentially benefit the most from developing and expanding GVC integration.

FDI is one of the key elements promoting trade and GVC integration. U.S. FDI positions in SSA remained almost unchanged from 2016 to 2018, though there was a decrease from 2017 to 2018. The mining sector was the largest destination sector, in terms of value, for cumulative U.S. investment in Africa.<sup>370</sup> However, the two largest sectors in terms of the number of actual projects were the services sector—specifically business services and software/information technology (IT) services. In 2018, the top three SSA destinations for outward U.S. investment stock were Mauritius, South Africa, and Nigeria.

Three industries are selected for case studies on U.S. firms' integration with key GVCs in SSA. They are motor vehicles, petroleum and natural gas extraction, and agrifood processing for beverages and coffee. These case studies illustrate the various forms of U.S. firms' integration with GVCs in SSA, as well as their respective opportunities and challenges. The key findings of these case studies are summarized in table 4.1.

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<sup>370</sup> This includes U.S. FDI positions in mining in SSA, as well as in North African countries including Algeria, Egypt, Libya, Tunisia, and Morocco. BEA data do not break out U.S. FDI positions in mining in SSA separately.

**Table 4.1** Key findings of case studies on U.S. firms' integration with key global value chains (GVCs) in SSA

Value chain	Countries of focus	U.S. firms' current integration	Opportunities and challenges for future integration
Motor vehicle manufacturing	South Africa, Nigeria	Ford engages in integrated vehicle and engine manufacturing in South Africa and in kit manufacturing in Nigeria. Thirteen U.S. firms engage in automotive parts manufacturing in South Africa.	U.S. firms have made few investments in SSA because of limited automobile manufacturing outside of South Africa. SSA's market size and greater regional integration, increased manufacturing capability, and improved government policies are expected to drive future opportunities in this sector.
Petroleum and natural gas extraction	Nigeria, Angola, Ghana, Mozambique, other SSA countries	Most of the major U.S. firms that engage in both petroleum and natural gas extraction, as well as oilfield services and supporting services, and that operate internationally are involved in SSA.	Further U.S. integration into SSA's petroleum and natural gas extraction value chain will depend on global supply and demand factors, as well as regulatory developments and the economic and technical viability of resource endowments in SSA countries.
Agri-food processing for coffee and beverages	South Africa, Nigeria, Ethiopia, Uganda, other SSA countries	U.S. multinational firms engage in production in the SSA beverage sector, supplying inputs and producing beverages for the local market. In the SSA coffee sector, U.S. firms primarily purchase raw coffee beans, but are increasingly involved in creating more sustainable networks of growers.	Opportunities exist for significant U.S. involvement in the beverage value chain due to the fast growth of the SSA beverage sector, though challenges remain from policy uncertainty, taxes, and weak transportation infrastructure. U.S. firms working in the coffee sector will likely face challenges developing regional, rather than country-specific, roasting and retail supply chains.

Source: Compiled by USITC.

## SSA's Participation in GVCs

Global investment and trade are increasingly structured around GVCs. This section presents an overview of SSA's participation in GVCs, which encompasses value chains at all levels, including global, regional, and domestic value chains, as well as industry- or product-specific value chains.

Engaging in GVCs provides SSA countries with opportunities for industrialization and economic upgrading, as well as the potential for structural transformation. It allows SSA countries to utilize their comparative advantage (e.g., a relatively cheap labor force that is the world's fastest-growing); develop a specialization in less sophisticated products, tasks, or functions within a value chain without having to first develop full domestic industrial capability; and benefit from knowledge and technology spillovers throughout value chain engagement. GVC involvement can create incentives for FDI inflows, grant global market access, and promote trade between countries. In addition, it incentivizes SSA countries to improve infrastructure, develop human capital, and grow services sectors that support value chains.<sup>371</sup> These economic upgrades, in turn, can attract more U.S. FDI in SSA, lead to an increasing demand for U.S. goods and services, and generate more opportunities for U.S. firms' integration with GVCs in SSA.

<sup>371</sup> AfDB, OECD, and UNDP, *African Economic Outlook 2014: Global Value Chains*, 2014, 128–30.

## Overview

An economy can engage in GVCs in one of two ways: “forward” and “backward.” When an economy provides tangible or intangible inputs for other economies’ production of exports, it is called forward GVC participation.<sup>372</sup> When an economy uses inputs from foreign sources for its own production of exports, it is called backward GVC participation.<sup>373</sup> Both forward and backward GVC participation are measured in terms of dollars (or other currency). In the trade in value added (TiVA) approach,<sup>374</sup> forward GVC participation is measured by domestic value added in an economy’s gross exports that are used for producing other economies’ exports, and backward GVC participation is measured by foreign value added in an economy’s gross exports. Over 70 percent of SSA GVC participation is in the form of forward GVC participation,<sup>375</sup> mainly by providing raw materials and primary inputs (e.g., crude petroleum, agricultural products, ores, or base metals) to other countries for downstream processing and export production.<sup>376</sup>

Total GVC-related trade, also referred to as GVC participation, is defined as the sum of the dollar value of forward and backward GVC participation. SSA’s total GVC-related trade was small but growing in recent decades, increasing from \$29.0 billion in 2000 to \$117.0 billion in 2018. SSA’s share of total global GVC-related trade increased slightly, from 0.9 percent to 1.0 percent in the period. As noted earlier, SSA does not play a big role in GVCs, lagging behind all other regions (table 4.2).<sup>377</sup>

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<sup>372</sup> An economy can engage in forward GVC participation via (1) upstream production activities, which it supplies tangible inputs such as raw or partially processed materials (e.g. crude petroleum), or components and parts (e.g. auto engines) to downstream industries for further processing or final production, or (2) upstream services activities, such as research and development or product design, which are incorporated in the ensuing production.

<sup>373</sup> An economy can engage in backward GVC participation via (1) downstream production activities which it further processes materials and inputs, or assembles components and parts into final products, or (2) downstream services activities such as marketing, sales, and customer services that bring final products to consumers.

<sup>374</sup> Trade in value added (TiVA) is a statistical approach to measuring GVCs, tracing value added embodied in final goods and services back to the originating industries and countries. TiVA measures can be estimated from multi-region input-output tables (MRIOTs) or inter-country input-output tables (ICIOTs). This section mainly uses TiVA measures from the UNCTAD-Eora GVC database. The database offers global coverage of 189 countries and “rest of world” and a time series from 1990 to 2018. It has TiVA data for 38 SSA countries, the most extensive SSA coverage among all available TiVA databases, and thus is the primary data source for SSA GVC analysis. Most of the reports referenced in this section also used various revisions of the UNCTAD-Eora GVC database. UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019); UNCTAD, “UNCTAD-Eora Global Value Chain Database: Methodology,” 2015.

<sup>375</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

<sup>376</sup> AfDB, OECD, and UNDP, *African Economic Outlook 2014: Global Value Chains*, 2014, 138.

<sup>377</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019). The geographical groupings of countries are based on a UN classification: [https://unstats.un.org/unsd/demographic-social/products/worldswomen/annex\\_tables/List%20of%20countries%20-%20Table%209.xls](https://unstats.un.org/unsd/demographic-social/products/worldswomen/annex_tables/List%20of%20countries%20-%20Table%209.xls).

**Table 4.2** Total GVC-related trade by regional block, 2000 and 2018 (percentage)

Region	2000	2018
Europe	52.7	53.8
Asia	23.5	27.3
North America	15.0	9.6
Latin America and the Caribbean	3.9	3.7
Middle East and Northern Africa	2.8	3.2
Oceania	1.1	1.4
Sub-Saharan Africa	0.9	1.0
Total	100.0	100.0

Source: USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

SSA's GVC participation is most integrated with Europe, and to a lesser degree, with Asia and North America. In 2018, Europe accounted for 57.7 percent of SSA's forward GVC participation. In other words, of the SSA value added used in other countries' gross exports, 57.7 percent went to Europe, while 26.9 percent went to Asia and 9.7 percent to North America (the U.S. share was 8.1 percent). In the same year, Europe accounted for 46.1 percent of SSA's backward GVC participation, or the amount of foreign value added in SSA's gross exports, compared to 30.6 percent from Asia and 10.9 percent from North America (the U.S. share was 9.4 percent). The development of intra-SSA regional value chains remains limited, as the SSA region accounted for only 4.0 percent of SSA's forward GVC participation and 11.7 percent of SSA's backward GVC participation.<sup>378</sup>

## GVC Participation by Region and Country

SSA's participation in total GVC-related trade (also referred to as GVC participation, or the sum of the dollar value of forward and backward GVC participation) varied notably by region.<sup>379</sup> In 2018, Southern Africa led SSA in GVC participation, accounting for nearly 55 percent of total GVC-related trade in SSA. It was followed by Western Africa (22.1 percent), Central Africa (14.3 percent), and Eastern Africa (8.9 percent).<sup>380</sup> SSA GVC participation also varied substantially by country. In 2018, the three largest SSA economies topped total GVC-related trade in SSA: South Africa alone accounted for 52.8 percent, followed by Nigeria (13.9 percent) and Angola (9.2 percent).<sup>381</sup>

Southern Africa also had the highest share of GVC-related trade in gross exports (also referred to as the GVC participation rate, or the sum of forward and backward GVC participation rates)<sup>382</sup> at 70.1 percent,

<sup>378</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

<sup>379</sup> Total GVC-related trade is the sum of the dollar value of forward and backward GVC participation.

<sup>380</sup> Eastern Africa includes Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Réunion, Rwanda, Somalia, Sudan, Uganda, Tanzania, Zambia, and Zimbabwe. Central Africa includes Angola, Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, and São Tomé and Príncipe. Southern Africa includes Botswana, Lesotho, Namibia, South Africa, and Eswatini (formerly Swaziland). Western Africa includes Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Source: UN Statistics Division (UNSD).

<sup>381</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

<sup>382</sup> GVC participation rate is measured by the share of GVC-related trade in gross exports. It is the sum of forward and backward GVC participation rates. Forward GVC participation rate is measured by the share of domestic value

followed by Eastern Africa (62.4 percent). Both of them had relatively balanced forward and backward GVC participation rates. In comparison, Central Africa and Western Africa relied heavily on forward GVC participation. In 2018, the SSA countries with the highest forward GVC participation rates were the Democratic Republic of the Congo (D.R. Congo), Liberia, Gabon, Cameroon, and Nigeria. All of these countries are located in Central or Western Africa; they are rich in natural resources and thus are major exporters of primary commodities. The SSA countries with the highest backward GVC participation rates were Lesotho, Eswatini (formerly Swaziland), Tanzania, São Tomé and Príncipe, and Mauritius, most of which are located in Southern or Eastern Africa with a relatively strong presence of manufacturing or services sectors (table 4.3).<sup>383</sup>

**Table 4.3** Top SSA countries with the highest GVC participation rate, percent, 2018 (percent)

Forward GVC participation rate (%)	Backward GVC participation rate (%)
Democratic Republic of the Congo	65.9 Lesotho
Liberia	47.1 Eswatini
Gabon	42.7 Tanzania
Cameroon	42.2 São Tomé and Príncipe
Nigeria	42.1 Mauritius

Source: USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

South Africa increasingly plays the role of a headquarters economy for the region<sup>384</sup> as well as the regional supply chain hub. In 2018, South Africa was the primary SSA source of foreign value added in other SSA countries' gross exports, especially for countries such as Angola, Botswana, Eswatini, Mauritius, Namibia, Zambia, and Zimbabwe.<sup>385</sup> South Africa can act as an important value chain connection to global markets for less advanced countries in the region.<sup>386</sup>

## GVC Participation by Sector

In 2015,<sup>387</sup> two sectors—mining, and financial and business services—accounted for the largest shares of SSA's GVC-related trade. The petroleum and chemical products, transport services, and agriculture sectors also contributed significantly to this trade.<sup>388</sup> Mining (including petroleum and natural gas extraction) topped both SSA's forward and backward GVC-related trade, reflecting the size as well as the economic importance of this sector in SSA. Nigeria, South Africa, and Angola were the leading SSA

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added in an economy's gross exports that are used for producing other economies' exports. Backward GVC participation rate is measured by the share of foreign value added in an economy's gross exports.

<sup>383</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

<sup>384</sup> The term "headquarters economy" refers to the economic phenomenon that certain regions with unique resources attract corporate headquarter clusters and attain the headquarters agglomeration effect. It allows the development of manufacturing bases in other regions through value chains, and therefore the optimization of regional resource allocation. Hong, "Study on Promoting the Competitiveness of Beijing Economy," March 2005.

<sup>385</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019); AfDB, OECD, and UNDP, *African Economic Outlook 2014: Global Value Chains*, 2014, 140.

<sup>386</sup> OECD, *Participation of Developing Countries in Global Value Chains: Implications for Trade*, 2015, 6.

<sup>387</sup> The most recent year of sectoral data available for download from UNCTAD-Eora GVC Database 2018 update is 2015.

<sup>388</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019); UNIDO, *Global Value Chains in Africa*, 2015, 25.

countries in GVC participation in the mining sector, mostly in petroleum extraction.<sup>389</sup> The sectors with the highest SSA regional integration (in terms of GVC-related trade within the region) were financial and business services, and metal products.<sup>390</sup>

Transportation equipment (including motor vehicles) topped SSA's backward GVC participation rate—i.e., the sector embedded the highest share of foreign value added in gross exports.<sup>391</sup> South Africa dominated backward GVC participation in this sector with its motor vehicle industry.<sup>392</sup> Textiles and apparel, electrical equipment and machinery, and other manufacturing also had notably high backward GVC participation in SSA.<sup>393</sup>

According to reports from international organizations, the sectors potentially benefiting the most from GVC integration include agriculture and agribusiness<sup>394</sup> (especially in Ethiopia and Seychelles), light manufacturing (particularly in Tanzania), and to a lesser extent, textile, transport, and tourism, as these sectors present SSA with more opportunities to leverage its comparative advantages.<sup>395</sup>

## Macroeconomic and Policy Environment

A number of macroeconomic and policy factors influence trade, FDI, and the degree and type of GVC participation by SSA countries. Macroeconomic factors affecting GVC integration include domestic market size, income level, industrial competitiveness, the distance to manufacturing hubs, and infrastructure and logistics performance.<sup>396</sup> Policy factors include trade policy measures such as tariffs and nontariff measures, the regulatory environment, and regional trade agreements and regional integration.<sup>397</sup> These factors present challenges as well as opportunities for trade, FDI, and further GVC integration, as the majority of SSA countries still score low in indices of these factors, yet some of them have experienced notable growth or improvement in recent years.

## Macroeconomic Factors

### Market Size

A growing domestic market, measured using gross domestic product (GDP) as a proxy, can attract inward FDI, drive up demand for imports, and spur the development of backward GVC participation as well as domestic value chains. SSA's GDP has grown rapidly in the past two decades, from \$368.9 billion in 1998 to \$1.7 trillion in 2018. Although SSA still lagged behind other developing regions and accounted

<sup>389</sup> For more information, see case study 4.2 in this chapter.

<sup>390</sup> AfDB, OECD, and UNDP, *African Economic Outlook 2014: Global Value Chains and Africa's Industrialization*, 2014, 143.

<sup>391</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

<sup>392</sup> For more information, see case study 4.1 in this chapter.

<sup>393</sup> USITC calculation based on UNCTAD-Eora GVC Database 2018 update (accessed October 21, 2019).

<sup>394</sup> For more information, see case study 4.3 in this chapter.

<sup>395</sup> IMF, *Trade Integration and Global Value Chains in Sub-Saharan Africa*, 2016, 27; AfDB, OECD, and UNDP, *African Economic Outlook 2014: Global Value Chains and Africa's Industrialization*, 2014, 130.

<sup>396</sup> For macroeconomic data at the SSA country level, see appendix E.

<sup>397</sup> OECD, *Participation of Developing Countries in Global Value Chains: Implications for*, 2015, 7, 8.

for less than 2 percent of 2018 global GDP, it is home to some of the fastest-growing economies in the world. Of the global top 25 economies with the highest annual GDP growth rates in 2018, 10 were from SSA, including Rwanda, Guinea, Côte d'Ivoire, Benin, Ethiopia, Senegal, The Gambia, Burkina Faso, Kenya, and Ghana, though their growth was from a low base.<sup>398</sup>

### Income Level

A higher level of development, measured using income as a proxy, is found to correspond to a higher level of trade and GVC participation. Developed countries with high incomes tend to source more goods and services from abroad and send a higher share of their exports as intermediate products.<sup>399</sup> The income level in SSA remains low across the majority of SSA countries. In 2018, of 48 SSA countries, only Seychelles is considered a high-income country. Six SSA countries, including Botswana, Equatorial Guinea, Gabon, Mauritius, Namibia, and South Africa, are considered upper-middle-income countries. The remaining 41 SSA countries fall into either the lower-middle (17 SSA countries) or low-income (24 SSA countries) brackets.<sup>400</sup> However, the income level in many SSA countries has improved from earlier years. Since 1998, 19 SSA countries have been able to move up at least one income level bracket.<sup>401</sup> The improvement of income levels in SSA countries can drive up final demand for manufactured goods and lead to the expansion of GVC integration.

### Industrial Competitiveness

Higher levels of industrialization and industrial competitiveness are found to correspond to a higher level of inward FDI and backward GVC participation for low-income countries.<sup>402</sup> The level of industrialization in most SSA countries, measured using manufacturing value added (MVA) per capita as a proxy,<sup>403</sup> is behind that of most nonindustrialized economies. Only three countries, Eswatini, Mauritius, and South Africa, had an MVA per capita above \$669.3, the average level of nonindustrialized economies in 2015. At the same time, 13 SSA countries had MVA per capita below \$100. In comparison, the average MVA per capita for industrialized economies in 2015 was \$5,092.1. Of 148 economies covered by the UN's *Industrial Development Report 2018*, which includes 28 SSA countries, 22 SSA countries were ranked in the bottom 50 in terms of industrial competitiveness. The higher scorers were South Africa (no. 47), Eswatini (no. 81), Nigeria (no. 82), Botswana (no. 84), Namibia (no. 86), and Mauritius (no. 87).<sup>404</sup> The low levels of industrialization and of industrial competitiveness hinder SSA

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<sup>398</sup> GDP presented here is in nominal terms, while the GDP growth rate is in real terms. World Bank, World Development Indicators (accessed September 3, 2019).

<sup>399</sup> OECD, *Participation of Developing Countries in Global Value Chains: Implications for Trade*, 2015, 7, 8.

<sup>400</sup> The classification of income level is based on gross national income (GNI) per capita. The thresholds change over the years. In 2018, the thresholds for different income groups, measured as GNI per capita, are as follows: low income,  $\leq \$1,025$ ; lower-middle income,  $\$1,026$ – $\$3,995$ ; upper-middle income,  $\$3,996$ – $\$12,375$ ; and high income,  $> \$12,375$ . World Bank, "World Bank Analytical Classifications: Current Classification and Historical Classification by Income" (accessed September 3, 2019).

<sup>401</sup> World Bank, "World Bank Analytical Classifications: Historical Classification by Income" (accessed September 3, 2019).

<sup>402</sup> World Economic Forum, *The Africa Competitiveness Report 2015*, 2015, 75.

<sup>403</sup> UNIDO, *Industrial Development Report 2018*, 2017, 181.

<sup>404</sup> UNIDO, *Industrial Development Report 2018*, 2017, 185–89.

countries in their efforts to attract FDI and to move away from their traditional specialization in primary sectors, as well as their dominant form of forward GVC participation—the export of raw or little-processed commodities.

## Distance to Major Manufacturing Hubs

GVC-related trade has been found to show strong regional concentration around the three main manufacturing hubs of Europe, the Asia-Pacific region, and North America. Distance to one of these three major hubs has a strong impact on the backward GVC participation in particular.<sup>405</sup> Due to historical linkages and relative proximity, Europe is the most important region for SSA in terms of trade and FDI, as well as GVC integration. However, the distance to major manufacturing hubs remains a formidable obstacle for most SSA countries. Developing regional value chains, promoting interregional trade, and creating an attractive business environment for FDI in SSA could be an alternative approach for countries seeking to expand and upgrade GVC participation in SSA.<sup>406</sup>

## Infrastructure and Logistics Performance

The geographic isolation of many SSA countries is further aggravated by the absence of quality infrastructure and logistics.<sup>407</sup> Measured by the Logistics Performance Index (LPI), a trade- and transport-related infrastructure quality index, on a scale of 1 to 5 (1 for low performance and 5 for high performance), in 2018 SSA on average scored 2.5, lagging behind all other regions and below the world average of 2.9.<sup>408</sup> Given these differences, firms in SSA face some of the highest transport costs in the world, and often need to deal with issues such as delays and unpredictability in shipments.<sup>409</sup> Global production networks in many industries rely on just-in-time production and depend on the reliability of intermediate input supply to meet their deadlines. SSA's poor infrastructure and logistics performance impede SSA countries from expanding trade, attracting FDI, or entering GVCs and developing regional supply chains.

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<sup>405</sup> World Economic Forum, *The Africa Competitiveness Report 2015*, 2015, 75.

<sup>406</sup> AfDB, OECD, and UNDP, *African Economic Outlook 2014: Global Value Chains and Africa's Industrialization*, 2014, 162, 172–74.

<sup>407</sup> World Economic Forum, *The Africa Competitiveness Report 2015*, 2015, 78.

<sup>408</sup> The Logistics Performance Index (LPI) measures a country's trade- and transport-related logistics performance. It is an aggregate measure with six components: customs, infrastructure, international shipments, logistics competence, tracking and tracing, and timeliness. LPI scores range from 1, low performance, to 5, high performance. World Bank, World Development Indicators; Logistics Performance Index (accessed February 5, 2020).

<sup>409</sup> World Economic Forum, *The Africa Competitiveness Report 2015*, 2015, 78.

## Policy Factors

### Trade Policy Measures

Facilitating smooth cross-border trade flows while reducing trade costs is essential for GVC participation. Restrictive trade policy measures, such as tariffs and nontariff measures (NTMs)<sup>410</sup> that increase trade costs and reduce trade opportunities, can make GVC participation economically infeasible, as the multi-border crossings inherent in international production processes amplify the effects of these restrictive trade policy measures. Compared to other regions, SSA maintains relatively high tariff and nontariff barriers to trade. For example, the weighted average applied tariff rate for SSA in 2017 was 5.67 percent, higher than for most other regional blocks except South Asia (table 4.4).<sup>411</sup> SSA also is found to lead all other regions in ad valorem equivalents (AVEs) of most NTMs, such as sanitary and phytosanitary (SPS) measures, technical barriers to trade (TBTs), and specific trade concerns.<sup>412</sup> By relaxing or removing these restrictive trade policy measures, SSA countries could promote trade, FDI, and GVC participation.

**Table 4.4** Weighted average effectively applied tariff rate, 2017 (percent) by world regions

World region	All products	Consumer goods	Intermediate goods	Capital goods
East Asia and Pacific	2.5	4.2	2.1	1.2
Europe and Central Asia	2.7	3.4	1.5	1.2
Latin America and Caribbean	3.5	5.7	2.8	2.8
Middle East and North Africa	4.9	7.7	3.3	2.9
North America	1.7	3.5	0.9	0.4
South Asia	6.0	9.4	7.9	4.1
Sub-Saharan Africa	5.7	10.0	4.1	2.9

Source: World Bank, WITS, <https://wits.worldbank.org/> (accessed September 17, 2019).

### Regulatory Environment

A conducive regulatory environment for doing business protects intellectual property rights and encourages FDI.<sup>413</sup> Creating such an environment for doing business is important for attracting multinational enterprises (MNEs), who are the driving force for bringing in FDI and establishing GVC linkages. MNEs are also critical for building local businesses that can benefit from entering GVCs either directly or indirectly through MNEs. Most SSA countries scored low on the World Bank's Ease of Doing Business rankings, a proxy to measure the business friendliness of the regulatory environment. Of the 190 economies covered, only 2 SSA countries, Mauritius and Rwanda, were ranked in the top 25th

<sup>410</sup> Nontariff measures (NTMs) are policy measures other than ordinary customs tariffs that can potentially have an economic effect on quantities and/or prices of traded goods. They include a very diverse array of policy measures, such as sanitary and phytosanitary measures, technical barriers to trade, price and quantity controls (e.g., quotas), and licensing requirements, among others.

<sup>411</sup> World Bank, WITS (accessed September 17, 2019).

<sup>412</sup> Grubler, Ghodsi, and Stehrer, "Assessing the Impact of Non-Tariff Measures on Imports," February 2016, 15.

<sup>413</sup> See the following section in this chapter for more information on FDI in SSA, and chapter 5 for more information on intellectual property rights (IPR) protections in SSA.

percentile at nos. 20 and 29, respectively. By contrast, 31 SSA countries ranked in the bottom 25th percentile.<sup>414</sup> Reforming business regulations in SSA countries could lead to greater GVC participation.

## Regional Trade Agreements

Regional trade agreements can promote regional economic integration, boost intra-regional trade, and support value chain participation by improving market access conditions, stimulating FDI, and enhancing the broad economic environment. Regional economic communities (RECs), such as the Common Market for Eastern and Southern Africa (COMESA) and the Economic Community of West African States (ECOWAS), have helped to promote the development of value chain integration within the regions.<sup>415</sup> Preferential trade agreements also play a role in helping to develop GVCs. For example, the Economic Partnership Agreement negotiated between the European Union (EU) and regional trade blocs of SSA countries was found to play a somewhat important role for certain export-oriented GVCs in SSA.<sup>416</sup> However, that agreement is less relevant to the development of GVCs producing products for domestic and SSA regional markets, because it does not improve market access conditions between SSA countries.<sup>417</sup> The agreement for the African Continental Free Trade Area (AfCFTA), which officially entered into force on May 30, 2019, may present an opportunity for SSA to improve its integration into GVCs.<sup>418</sup>

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<sup>414</sup> World Bank, Ease of Doing Business rankings (accessed September 25, 2019).

<sup>415</sup> See chapter 8 for more information on RECs and other aspects of regional integration.

<sup>416</sup> Woolfrey and Bilal, “The Impact of Economic Partnership Agreements on the Development of African Value Chains,” June 2017, 26.

<sup>417</sup> Woolfrey and Bilal, “The Impact of Economic Partnership Agreements on the Development of African Value Chains,” June 2017, 26.

<sup>418</sup> For more information on the AfCFTA, see chapter 8.

## U.S. Foreign Direct Investment in SSA

Foreign direct investment (FDI) is one of the key elements promoting trade and GVC participation. Investment features prominently in the macroeconomic and policy factors discussed above, particularly market size, infrastructure development, and regulatory quality. This section presents an overview of U.S. FDI in SSA, from 2016 to 2018, with an examination of the leading destination countries and sectors for U.S. investment.

### Overview

The United States is one of the largest single-country investors in SSA, behind France and the Netherlands, but ahead of the United Kingdom and China.<sup>419</sup> In 2018, the United States' outward FDI position in SSA was \$34.0 billion (table 4.5),<sup>420</sup> a 5.8 percent decline from 2017, but almost unchanged from 2016 levels.

**Table 4.5** U.S. outward FDI position in SSA, total and selected countries, 2016–18

	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR) 2016–18
	Million \$				%
Mauritius	9,678	10,424	9,544	-134	-0.7
South Africa	6,659	7,334	7,621	962	7.0
Nigeria	4,349	5,774	5,630	1281	13.8
Ghana	1,982	1,698	1,661	-321	-8.5
Tanzania	1,345	1,383	1,444	99	3.6
Liberia	1,029	874	236	-793	-52.1
Equatorial Guinea	508	654	908	400	33.7
Angola	646	780	394	-252	-21.9
Kenya	438	405	380	-58	-6.9
Mozambique	473	398	332	-141	-16.2
All other SSA	6,911	6,430	5,898	-1,013	-7.6
<b>Total SSA<sup>a</sup></b>	<b>34,018</b>	<b>36,154</b>	<b>34,048</b>	<b>30</b>	<b>0.0</b>

Source: USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019); USITC calculations.

<sup>a</sup>Total U.S. FDI positions in SSA as a whole are not provided by BEA. Total SSA positions were calculated by subtracting U.S. positions in North African countries from total U.S. positions in Africa.

### FDI by Destination Country

In 2018, the three largest destinations in SSA for cumulative outward U.S. investment were Mauritius, South Africa, and Nigeria. Of these, only Mauritius experienced a decrease in cumulative U.S. investment from 2016 levels (table 4.5).

<sup>419</sup> UNCTAD, *World Investment Report 2019* (accessed September 9, 2019). According to UNCTAD, the top five investors in Africa in 2017 were France, the Netherlands, the United States, the United Kingdom, and China.

<sup>420</sup> FDI position (or stock) is a measure of cumulative investment over time. This is in comparison to FDI flows, which are a measure of new investment in a single year.

The U.S. FDI position in Mauritius, the largest destination in SSA for U.S. outward FDI, was \$9.5 billion in 2018, a compound annual percentage decrease<sup>421</sup> of 0.7 percent since 2016. This decline was primarily driven by a reduction in U.S. investment in holding companies, one of the leading sectors for outward U.S. FDI. In Mauritius, the bulk of U.S. FDI positions (69.8 percent) were directed toward holding companies (\$3.7 billion) and finance and insurance (\$2.9 billion).<sup>422</sup> The country's stable macroeconomic environment, overall good institutional quality, and ease of doing business most likely explain much of the attraction of U.S. investors to Mauritius's financial services sector.

Additionally, Mauritius has historically been a significant offshore center, serving as a major route for foreign investors to access India and other third-party countries. A large portion of official FDI inflows into Mauritius are redirected to third-party countries, including possibly other SSA countries.<sup>423</sup> This is primarily because India and Mauritius have a double taxation treaty,<sup>424</sup> under which capital gains are taxed only in the country of residence. Since Mauritius does not tax gains on investment income, it has been an attractive location for firms channeling capital to India. Thus, a significant share of U.S. FDI outflows to Mauritius have ended up in FDI-funded projects or deals in India.<sup>425</sup> However, with the renegotiation of the Mauritius-India Taxation Treaty in 2016, Mauritian investors in India were taxed on capital gains at half the Indian rate until April 2019, after which their investments have been taxed at the full Indian capital gains tax rate. This change may have contributed to the decline in U.S. FDI positions in Mauritius.<sup>426</sup>

The U.S. outward FDI position in South Africa increased from \$6.7 billion in 2016 to \$7.6 billion in 2018, with a compound annual growth rate (CAGR) of 7.0 percent. Manufacturing accounted for the largest share, at 48.8 percent, of U.S. FDI in the country. It was followed by professional, scientific, and technical services; wholesale trade; and financial and insurance services, which together made up 27.5 percent of U.S. FDI positions in South Africa.<sup>427</sup> The increase in U.S. investment to South Africa primarily reflected substantial increases in investment in wholesale trade and in professional, scientific, and technical services. During 2016–18, U.S. outward FDI to South Africa's manufacturing sector experienced only modest growth (a CAGR of 1.5 percent), with most of this growth occurring in the chemicals sector.

The U.S. outward FDI position in Nigeria, the third-largest destination for U.S. FDI, was \$5.6 billion in 2018. U.S. FDI was down 2.5 percent from 2017, but up 29.5 percent from 2016, for a CAGR of 13.8 percent. The mining sector made up the largest share of U.S. outward FDI in Nigeria in 2018 (30.3 percent). However, this share was down considerably from 2016, when U.S. positions in the mining

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<sup>421</sup> Or a compound annual growth rate (CAGR) of -0.7 percent. Unless otherwise specified, growth is expressed in CAGR.

<sup>422</sup> USDOC, BEA, Balance of Payments and Direct Investment Position Data (accessed August 5, 2019).

<sup>423</sup> Damgaard et al. (2019) concludes that Mauritius ranks as one of the lowest countries in the world in terms of the estimated real FDI as a share of total FDI, and that only 4 percent of the inward FDI remains in Mauritius as real FDI, while the majority is re-directed to other third-party countries. Damgaard et al., "What Is Real and What Is Not?" December 11, 2019.

<sup>424</sup> The purpose of double taxation treaties is to mitigate taxation by two jurisdictions on one financial transaction or asset.

<sup>425</sup> Seetenah, "Inward FDI in Mauritius," April 30, 2013.

<sup>426</sup> Fowler, "India and the Renegotiation of Its Double Tax Agreement with Mauritius," April 4, 2019.

<sup>427</sup> USDOC, BEA, Balance of Payments and Direct Investment Position Data (accessed August 5, 2019).

sector made up over 60 percent of total U.S. FDI positions in Nigeria.<sup>428</sup> Part of this reduction in share size was due to divestment in the mining sector, but most of it was due to the increasing shares of other industries outside of mining. The manufacturing sector made up a small fraction of U.S. FDI positions in Nigeria in 2018 (3.3 percent).<sup>429</sup>

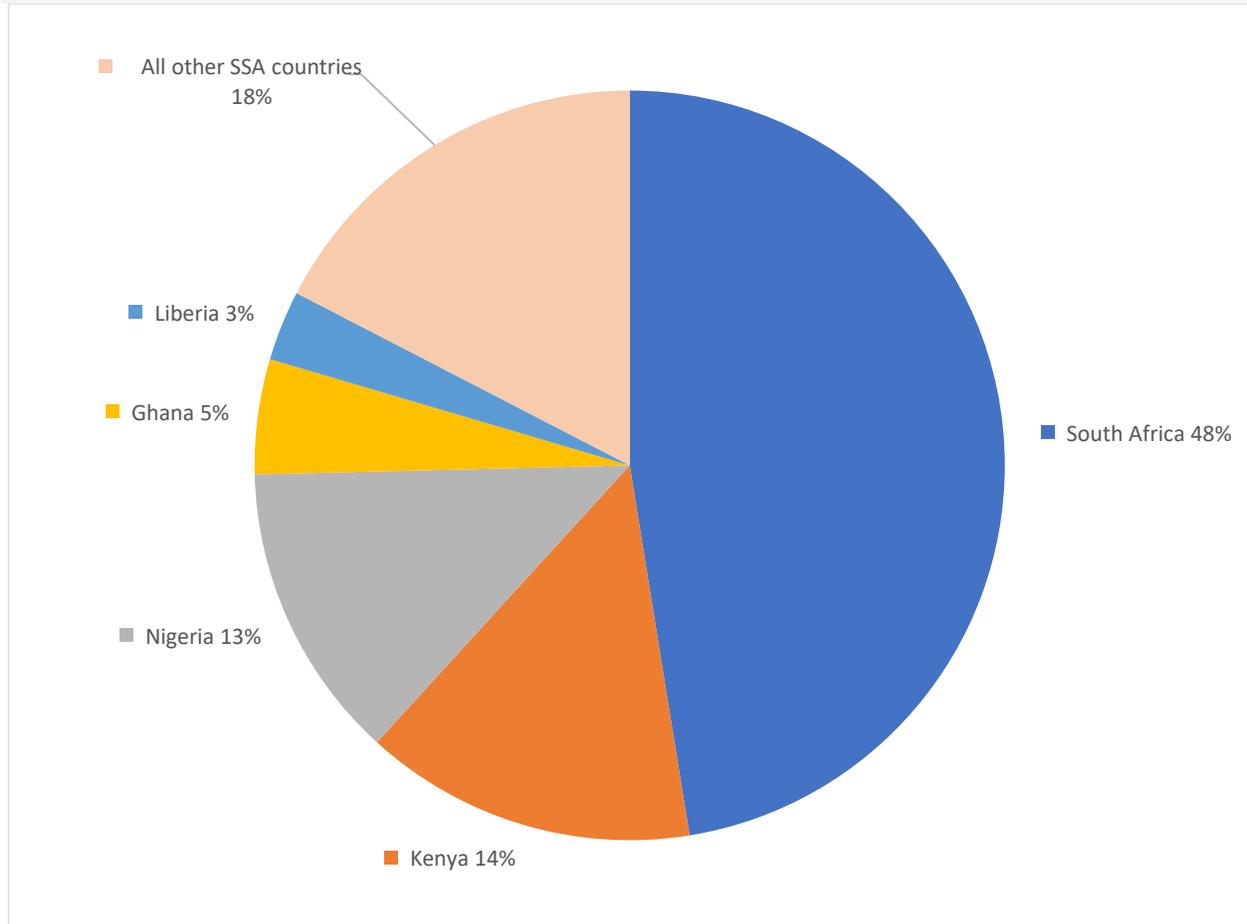
While Mauritius has been the largest destination for U.S. outward FDI positions in terms of total value, South Africa, Kenya, Nigeria, and Ghana are the primary destinations for U.S. investment in terms of the number of actual projects and deals made during 2016–18 (figure 4.1). There were 375 U.S. projects total—merger and acquisition (M&A) deals and greenfield<sup>430</sup> investment combined—in SSA during 2016–18.

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<sup>428</sup> USDOC, BEA, Balance of Payments and Direct Investment Position Data (accessed August 5, 2019).

<sup>429</sup> It is not possible to identify which industries outside of mining and manufacturing experienced an increase in U.S. FDI positions because BEA suppressed certain data for business confidentiality purposes.

<sup>430</sup> Greenfield FDI projects are defined as new investments by foreign investors, as opposed to acquisitions of existing companies or equity investments in existing companies.

**Figure 4.1** U.S. greenfield projects and M&A deals in SSA by destination, 2016–18

Source: *Financial Times*, fDiMarkets database; Bureau van Dijk, Zephyr database (accessed August 5, 2019).

Note: Underlying data for this figure can be found in appendix table I. See appendix table I.4 for a tabular presentation of the data in this figure.

## FDI by Sector

Official data on U.S. FDI positions in SSA by industry are limited.<sup>431</sup> However, the U.S. Department of Commerce’s Bureau of Economic Analysis (BEA) publishes data on U.S. FDI positions in the whole of Africa by industry.<sup>432</sup> In 2018, 31.7 percent of the U.S. FDI position in all of Africa was directed to the mining sector; 29.0 percent was directed to holding companies; 8.8 percent was directed to the manufacturing sector; and the remaining 30.5 percent was divided among various services sectors, such as wholesale trade and construction, as well as agriculture (table 4.6).

<sup>431</sup> Data are limited due to the suppression of country-level industry data to protect company confidentiality. Table 3.3, therefore, references U.S. FDI positions in Africa as a whole.

<sup>432</sup> U.S. FDI positions in Africa include FDI in SSA as well as in North African countries including Egypt, Libya, Tunisia, and Morocco.

**Table 4.6** U.S. FDI position in Africa, by industry, 2016–18

Industry	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
		Million \$			2016–18
					%
Mining	22,324	17,545	15,140	-7,184	-17.6
Holding companies (nonbank)	10,703	13,449	13,842	3,139	13.7
Manufacturing	4,873	4,716	4,226	-647	-6.9
Finance (except depository institutions) and insurance	4,081	4,648	3,934	-147	-1.8
Wholesale trade	2,052	2,174	2,335	283	6.7
Professional, scientific, and technical services	1,767	1,686	1,923	156	4.3
Other industries	5,889	6,067	6,396	507	4.2
Total for all industries	51,689	50,285	47,796	-3,893	-3.8

Source: USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019); USITC calculations.

Although the mining sector has historically been the largest recipient of U.S. FDI monetarily, primarily due to high-value projects, in terms of the number of greenfield projects in SSA during 2016–18, services industries were the clear leaders. Table 4.7 lists the number of U.S. greenfield FDI projects in SSA during 2016–18. It shows that U.S. investors focused on business services; software and information technology (IT) services; and communications. Coal, oil, and natural gas made up just 3.0 percent of all U.S. greenfield projects in SSA from 2016 to 2018.

**Table 4.7** U.S. greenfield FDI projects in SSA, by number of projects and percent, 2016–18

Project sector	Number of projects	% of total
Business services	30	18.1
Software and information technology (IT) services	29	17.5
Communications	23	13.9
Hotels and tourism	8	4.8
Food and tobacco	8	4.8
Transportation	8	4.8
Financial services	7	4.2
Chemicals	6	3.6
Renewable energy	6	3.6
Beverages	6	3.6
Coal, oil, natural gas	5	3.0
All others	30	18.1
Total	166	100.0

Source: *Financial Times*, fDiMarkets database.

Similarly, the services sector was the largest destination for M&A in SSA during 2016–18. Table 4.8 shows that in terms of the number of deals, U.S. investors focused on “other services” (34.4 percent), including IT, business, and financial services; metal and metal products (11.0 percent); wholesale and retail trade (8.6 percent); and publishing and printing (6.7 percent).

**Table 4.8** U.S. merger and acquisition (M&A) deals in SSA, by select top sectors, 2016–18

M&A deal sectors	Number of deals	% of total
Other services	72	34.4
Metals and metal products	23	11.0
Wholesale and retail trade	18	8.6
Publishing, printing	14	6.7
Transport	14	6.7
Hotels and restaurants	14	6.7
Chemicals, rubber, plastics, nonmetallic products	9	4.3
Food, beverages, tobacco	8	3.8
Post and telecommunications	7	3.3
All other deals	30	14.4
<b>Total</b>	<b>209</b>	<b>100.0</b>

Source: Bureau van Dijk, Zephyr database; USITC calculations.

Note: The category “other services” includes all services sectors except construction, wholesale and retail trade, hotels and restaurants, transport, post and telecommunications, banks, insurance, education, health, and public administration and defense.

## Mining

### FDI Position

In 2018, the mining sector was the largest destination for U.S. investment in Africa, accounting for nearly one-third (31.7 percent) of all U.S. FDI positions on the continent.<sup>433</sup> U.S. FDI in the sector totaled \$15.1 billion in 2018. However, FDI in the mining sector has decreased every year since 2016, in terms of both U.S. FDI position and share of all U.S. FDI positions in Africa. In 2016, U.S. FDI in the sector was \$22.3 billion or 43.2 percent of all U.S. FDI on the continent; in 2017, it was \$17.5 billion, or 34.9 percent. Nigeria was the largest destination for investment within the mining sector (table 4.9).

**Table 4.9** United States FDI position in SSA, mining sector, selected countries, 2016–18

	2016	2017	2018	Absolute change 2016–18	CAGR 2016–18
	Million \$				%
Nigeria	2,611	2,097	1,704	-907	-19.2
Ghana	<sup>(a)</sup>	<sup>(a)</sup>	1,377	<sup>(b)</sup>	<sup>(b)</sup>
Equatorial Guinea	476	<sup>(a)</sup>	875	399	35.6
Angola	472	445	226	-246	-30.8
Mauritius	19	23	27	8	19.2
South Africa	-92	-173	-165	-73	-33.9

Source: USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019); USITC calculations.

<sup>a</sup> Data were suppressed to avoid disclosure of individual company information.

<sup>b</sup> Unable to calculate.

U.S. mining sector investment in the six largest SSA destinations was volatile during 2016–18. Half of these destinations experienced declines during the period. The U.S. FDI position in Nigeria decreased by 18.7 percent, from \$2.1 billion in 2017 to \$1.7 billion in 2018, and was 34.7 percent lower than in 2016. U.S. FDI stock in Angola’s mining sector fell by nearly half, from over \$400 million in 2016–17 to \$226

<sup>433</sup> U.S. FDI positions by major sector are not available for SSA as a region.

million in 2018. On the other hand, U.S. FDI stock in Equatorial Guinea's mining sector increased 83.4 percent from \$476 million in 2016 to \$875 million in 2018.

The decrease in U.S. FDI in the mining sector in SSA is largely due to the U.S. industry's pivot toward exploiting U.S. domestic oil and gas reserves, according to testimony given at the Commission's public hearing.<sup>434</sup> In addition, the lack of legislation allowing the control of oil and gas by non-Nigerian companies operating in the petroleum sector in Nigeria has tempered investment there.<sup>435</sup> Weakening non-oil commodity prices and volatility in oil prices during 2018 also eroded investment in the SSA mining sector, despite price recovery otherwise since 2016.<sup>436</sup>

## Greenfield Projects and M&A Deals

While the mining industry held the largest share of U.S. investment on the continent, it accounted for 23 U.S. acquisitions from 2016 to 2018, but only eight U.S. greenfield projects.<sup>437</sup> However, the value of these transactions was significant. For example, in August 2017, U.S. firm Anadarko Petroleum announced its multibillion-dollar investment in a liquefied natural gas plant in northern Mozambique.<sup>438</sup> In April 2018, U.S. investment firm Fairfax Africa Fund invested \$4 billion in collaboration with Asian investors to build an oil refinery in Ethiopia.<sup>439</sup> Another indication of high-value investments was ExxonMobil's announcement in July 2018 of its intention to construct a roughly \$30 billion natural gas project in Mozambique.<sup>440</sup>

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<sup>434</sup> USITC, hearing transcript, July 24, 2019 (testimony of Anthony Carroll, Johns Hopkins University).

<sup>435</sup> USITC, hearing transcript, July 24, 2019 (testimony of Anthony Carroll, Johns Hopkins University). The federal government of Nigeria has control of oil and gas under the Constitution of Nigeria (1999) and the Petroleum Act (2004, as amended). Companies can hold rights to oil and gas by obtaining certain licenses and leases required by the Nigerian Ministry of Petroleum Resources. For more information, see Awogbade et al., "Oil and Gas Regulation in Nigeria: Overview," May 2017.

<sup>436</sup> IMF, *Regional Economic Outlook: Sub-Saharan Africa*, April 2019.

<sup>437</sup> The eight U.S. greenfield projects are in the coal, oil, and gas, metals, and minerals sectors. The 23 U.S. acquisitions are in the metals and metal products sector.

<sup>438</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); Anadarko, "Anadarko Reaches Significant Mozambique LNG Milestone," July 31, 2017. In 2019, Anadarko announced approval of the project to begin construction of the \$20 billion project. Reuters, "Anadarko Approves \$20 Billion LNG Export Project in Mozambique," June 18, 2019. In May 2019, Total announced a binding agreement with Occidental to acquire Anadarko's assets in Africa. Total, "Total Agrees with Occidental," May 5, 2019. Occidental finalized its acquisition of Anadarko in August 2019. Occidental, "Occidental Completes Acquisition of Anadarko," August 8, 2019.

<sup>439</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); Ethiopian Investment Commission, "Fairfax Plans to Build USD 4 Bln Oil Refinery in Ethiopia," April 18, 2018.

<sup>440</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); ExxonMobil, "Rovuma LNG Phase 1 Development Plan Submitted," July 9, 2018. In 2019, Exxon made an initial \$500 million investment in the project. Reuters, "Exxon to Make \$500 Million Initial Investment," October 8, 2019.

## Services

### FDI Position

Data on U.S. FDI positions in SSA services sectors are limited. Also, it is difficult to discern trends or calculate SSA, country-specific, or industry-specific totals, as many observations within the dataset are suppressed in order to avoid disclosing information on individual firms.<sup>441</sup> However, a few useful observations still emerge from a review of this data.

Available data suggest that U.S. outward FDI stock in certain African services sectors fluctuated during 2016–18, but continued to account for a very small share of total U.S. FDI in the continent. On the other hand, as mentioned in hearing testimony, the services sector was the main source of growth for U.S. FDI in SSA, increasing by 46 percent from 2014 to 2017.<sup>442</sup> U.S. FDI growth in the services sector was by no means uniform: for example, U.S. FDI in the African finance and insurance sector (excluding depository institutions) totaled \$3.9 billion in 2018, \$147 million less than in 2016 and \$714 million less than in 2017. By contrast, U.S. investment in the professional, scientific, and technical services sectors in Africa increased by \$156 million to \$1.9 billion in 2018 compared with 2016, and was \$237 million greater than in 2017. U.S. outward FDI in the African information industry increased every year during 2016–18 at a CAGR of 1.1 percent and was \$784 million in 2018.<sup>443</sup>

BEA data show that Mauritius held approximately three-quarters of U.S. outward investment in the African finance and insurance industry (excluding depository institutions such as banks and savings associations) during 2016–18.<sup>444</sup> In 2018, Mauritius accounted for \$2.9 billion, or 74.5 percent of the total, while South Africa followed far behind with 12.6 percent. Mauritius also held the majority share of U.S. FDI in African professional, scientific, and technical services, accounting for \$989 million, or 51.4 percent of the total in 2018. This share decreased from 57.6 percent (\$1.0 billion) of total U.S. FDI in African professional, scientific, and technical services in 2016, while South Africa's share of this industry increased from 34.3 percent (\$606 million) in 2016 to 44.7 percent in 2018 (\$859 million). In total, Mauritius and South Africa made up 96 percent of total U.S. outward FDI positions in this sector in 2018. U.S. FDI in information services was less concentrated: South Africa held the largest share at nearly one-third of all investment in 2018, followed by Mauritius, which accounted for 10.1 percent.<sup>445</sup>

### Greenfield Projects and M&A Deals

As shown in tables 4.7 and 4.8 above, the majority of U.S. greenfield projects and M&A deals in SSA during 2016–18 were in the services sector. Of the 166 greenfield projects reported during 2016–18,

<sup>441</sup> For example, data for some of the largest destinations of U.S. FDI in services, such as South Africa, are suppressed for several years and for certain industries to protect company confidentiality.

<sup>442</sup> USITC, hearing transcript, July 24, 2019 (testimony of Anthony Carroll, Johns Hopkins University).

<sup>443</sup> USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019).

<sup>444</sup> According to testimony at the hearing, Mauritius has a double taxation and avoidance agreement with India, and much of the U.S. investment into Mauritius goes to India on a tax-preferential basis. USITC, hearing transcript, July 24, 2019 (testimony of Anthony Carroll, Johns Hopkins University); USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019).

<sup>445</sup> USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019).

nearly 60 percent were in the services sector;<sup>446</sup> most occurred in South Africa (40 projects), followed by Nigeria and Kenya (12 projects each). Several high-value investments have occurred in the data processing, hosting, and related services sector in South Africa, including investments by Amazon Web Services (estimated at \$483 million during 2016–18),<sup>447</sup> Microsoft (estimated at \$188 million),<sup>448</sup> and Cloudflare (estimated at \$188 million). The latter has also invested in Nigeria (for more information on the cloud sector in SSA, see case study 7.1 in chapter 7 of this report).<sup>449</sup>

## Manufacturing

### FDI Position

The manufacturing sector represented a small share of total U.S. outward FDI positions as a whole in 2018, accounting for 8.8 percent of all U.S. FDI positions on the continent.<sup>450</sup> U.S. outward FDI in the sector totaled \$4.2 billion in 2018. U.S. outward FDI in the manufacturing sector decreased in value terms each year between 2016 and 2018. In 2016, U.S. FDI in the sector was \$4.9 billion or 9.4 percent of all U.S. FDI in Africa, and in 2017, FDI was \$4.7 billion or 9.4 percent. South Africa was the largest destination for U.S. FDI within the manufacturing sector (table 4.10).

**Table 4.10** U.S. FDI position in SSA manufacturing sector, selected countries, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
Million \$					
South Africa	3,604	3,810	3,716	112	1.5
Nigeria	218	175	188	-30	-7.1
Kenya	38	42	31	-7	-9.7
Ghana	64	76	( <sup>a</sup> )	( <sup>b</sup> )	( <sup>b</sup> )
Zambia	20	29	36	16	34.2
Mauritania	22	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )	( <sup>b</sup> )

Source: USDOC, BEA, Balance of Payments and Direct Investment Position Database (accessed August 5, 2019); USITC calculations.

<sup>a</sup> Data were suppressed to avoid disclosure of individual company information.

<sup>b</sup> Unable to calculate.

U.S. manufacturing sector investment is increasingly concentrated in South Africa. In 2018, South Africa accounted for 87.9 percent of the total U.S. FDI position in manufacturing in Africa, higher than its share in 2016 (74.0 percent) and 2017 (80.2 percent). U.S. FDI in manufacturing increased in South Africa by \$112 million to \$3.7 billion from 2016 to 2018, while the United States' total sector investment on the continent decreased by \$647 million over the period. Nigeria was a distant second as a destination for

<sup>446</sup> The services sector percentage includes the sectors of business services, communications, financial services, healthcare, hotels and tourism, and software and information technology services.

<sup>447</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); Arrington, "Amazon CloudFront Announces New Edge Locations in Johannesburg and Bangalore," June 14, 2018.

<sup>448</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); Addo, "Microsoft's Africa Datacenters Go Live in South Africa," March 6, 2019. For more information on cloud computing in South Africa, see chapter 7.

<sup>449</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); Levy, "Cape Town (South Africa): Cloudflare Data Center #113," May 11, 2017; Levy, "Lagos, Nigeria—Cloudflare's 155th City," October 30, 2018.

<sup>450</sup> U.S. FDI positions by major sector are not available for SSA as a region.

U.S. FDI in Africa’s manufacturing sector, accounting for between 3.7 percent and 4.5 percent during 2016–18. Other than South Africa, Zambia was the only destination to experience an increase in U.S. FDI in the sector, rising from \$20 million in 2016 to \$36 million in 2018.

According to the United Nations *World Investment Report 2019*, investment in SSA manufacturing is likely to remain concentrated in South Africa, though countries such as Ethiopia and Kenya are emerging as manufacturing destinations.<sup>451</sup> The biggest constraints on U.S. FDI in manufacturing in SSA are poor infrastructure, small segmented markets, workers’ underdeveloped skills levels, and governance issues, as noted at the hearing.<sup>452</sup> However, the African Continental Free Trade Area (AfCFTA), as envisioned, would have a significant impact on manufacturing and industry development, which may incentivize future investment.<sup>453</sup>

## Greenfield Projects and M&A Deals

The number and value of SSA manufacturing-related greenfield investments from the United States declined from 2016 to 2018, in tandem with lower U.S. FDI in manufacturing.<sup>454</sup> Sectors receiving such investment included renewable energy, chemical, pharmaceuticals, engines and turbines, and industrial equipment. Six of the renewable energy projects were launched during 2016–18 (the largest number of projects and highest capital investment in any manufacturing subsector in Africa), and all were started in 2016. Five of those projects were related to a memorandum of understanding signed by General Electric (GE) and the Nigerian government for the construction of solar power plants.<sup>455</sup> Although SSA manufacturing-related greenfield investment from the United States has declined, U.S. greenfield investment in South Africa remained consistent; five projects were launched each year from 2016 to 2018. These included large investments in the automotive assembly and components industry, as well as investments in engines and turbines, industrial equipment, and chemicals and pharmaceuticals.<sup>456</sup>

## U.S. Firms’ Integration with Key GVCs in SSA

This section presents three case studies on U.S. firms’ integration with key GVCs in SSA: motor vehicles manufacturing, petroleum and natural gas extraction, and agrifood processing. They were selected because of their relative importance to SSA economies and the strong presence of U.S. participation in these value chains, and for their large potential for deepening U.S. firms’ integration.

These case studies illustrate the various forms of U.S. firms’ integration with GVCs in SSA, as well as their respective opportunities and challenges. For traditional industries oriented toward foreign markets,

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<sup>451</sup> UNCTAD, *World Investment Report*, 2019.

<sup>452</sup> USITC, hearing transcript, July 24, 2019 (testimony of Anthony Carroll, Johns Hopkins University). For a detailed analysis of recent impediments to investment in SSA, see USITC, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Developments*, April 2018.

<sup>453</sup> USITC, hearing transcript, July 24, 2019 (testimony of Landry Signé, Brookings Institution); Signé and Van der Ven, “Keys to Success for the AfCFTA Negotiations,” May 2019.

<sup>454</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019).

<sup>455</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019); Bungane, “Nigeria Signs MoU with GE,” November 30, 2016.

<sup>456</sup> *Financial Times*, fDi Markets database (accessed August 27, 2019).

such as coffee, U.S. firms mainly focus on securing local sourcing in SSA while carrying out downstream production outside of SSA. For growing industries that are oriented toward local markets, such as the motor vehicle and beverage industries, U.S. firms often bring in FDI, set up local operations, and/or supply intermediate inputs to local production in SSA. In addition, U.S. firms also engage in GVCs in SSA by supplying machinery and equipment and by providing value-added services, as in the case of the petroleum and natural gas extraction value chain. U.S. multinational enterprises (MNEs) lead the GVC integration in SSA, such as Ford in the motor vehicle value chain, Coca-Cola in the beverage value chain, and ExxonMobil in the petroleum extraction value chain.

## Case Study 4.1: Motor Vehicle Manufacturing

### Overview

The automotive industry is highly concentrated, with a few countries and companies leading world production, and it has a complex and highly integrated supply chain. A vehicle is assembled from thousands of parts that are sourced from hundreds of suppliers.<sup>457</sup> The supply chain centers on original equipment manufacturers (OEMs),<sup>458</sup> which source parts and components from suppliers of raw materials or sub-components further upstream. OEMs then assemble the vehicle and distribute the completed vehicle to downstream dealerships (see figure 4.2). Parts suppliers are often clustered near vehicle production sites, particularly those supplying heavier parts, in an effort to reduce transportation costs and ensure parts arrive “just in time.”<sup>459</sup> The automotive industry has a global supply chain and concentrated regional production locations. Investments in automotive manufacturing facilities are capital intensive and long term in nature. Thus, location and sourcing decisions are based on a broad range of factors, including macroeconomic stability and political risk, access to a large domestic or regional market, a skilled workforce, previous investments or relationships, and adequate infrastructure, including electricity, roads, and ports.<sup>460</sup>

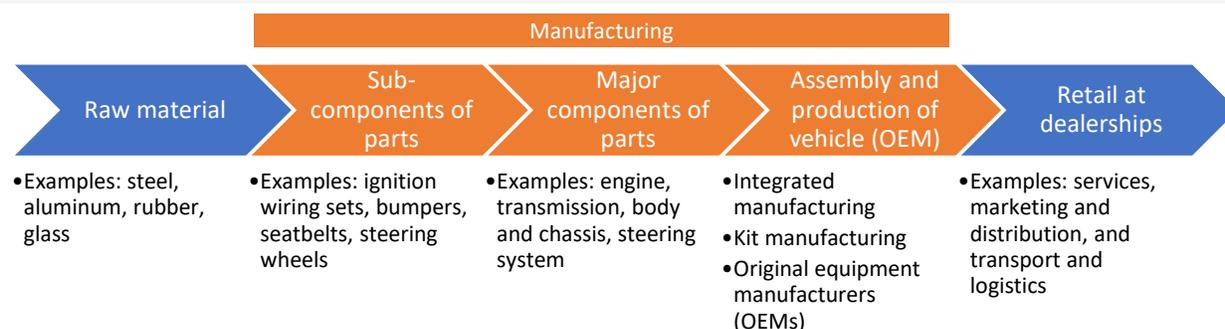
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<sup>457</sup> USITC, *U.S.-Mexico-Canada Trade Agreement: Likely Impact*, April 2019, 70.

<sup>458</sup> An original equipment manufacturer (OEM) is typically a vehicle assembly company such as Ford, Fiat-Chrysler, General Motors, or Tesla. OEM can also refer to any company that manufactures parts for a new vehicle, though in this text OEMs are solely referred to as vehicle assemblers. For more information, see Cars.com, “What Is an OEM?” September 5, 2017.

<sup>459</sup> USITC, *U.S.-Mexico-Canada Trade Agreement: Likely Impact*, April 2019, 70.

<sup>460</sup> UNCTAD, *Economic Development in Africa Report 2019*, June 2019, 151.

**Figure 4.2** Automotive value chain

Source: UNCTAD, *Economic Development in Africa Report 2019*, June 2019.

The automotive value chain in SSA is primarily concentrated in South Africa, although some other countries also assemble vehicles from kits.<sup>461</sup> South Africa is the only country that has integrated manufacturing facilities for vehicles at scale in SSA, and vehicle manufacturers in South Africa produce passenger cars, light trucks, buses, and heavy trucks. Vehicle production in South Africa totaled more than 610,000 units in 2018, putting South Africa in 22nd place among the world's vehicle-manufacturing countries.<sup>462</sup> Table 4.11 shows vehicle production in South Africa by manufacturer. In addition, there are nearly 130 companies that produce motor vehicle parts and components in South Africa.<sup>463</sup> For example, South Africa is the only SSA country that produces engines, and engine production totaled 120,000 units in 2018.<sup>464</sup>

**Table 4.11** Leading integrated motor vehicle manufacturers in South Africa in 2017

Manufacturer	Headquarters	Products	2017	2017	2017 Total
			passenger vehicles	commercial vehicles	
Toyota	Japan	Toyota Corolla, Dyna, Fortuner, HiAce, Hilux	35,280	91,147	126,427
Daimler	Germany	Mercedes-Benz C-Class	120,137	950	121,087
Volkswagen	Germany	Volkswagen Polo, Polo Vivo	115,827	0	115,827
Ford	United States	Ford Everest, Ford Ranger, Mazda BT-50	0	93,659	93,659
BMW	Germany	BMW X3	53,151	0	53,151
Renault-Nissan-Mitsubishi	France/Japan	Dacia Logan Pickup, Nissan Frontier, Tiida, NP200, NP300	0	35,000	35,000

Source: Wards Automotive Intelligence (accessed September 2019).

Notes: These data are only for integrated vehicle manufacturing, which is why they only include South Africa. Available automotive data do not include vehicle assembly from kits. Additionally, only vehicle manufacturers producing more than 35,000 units are listed.

<sup>461</sup> Black, Makundi, and McLennan, "Africa's Automotive Industry: Potential and Challenges," September 2017.

<sup>462</sup> Lamprecht, *Automotive Export Manual 2019*, 2019, 36. OICA, "2018 Production Statistics" (accessed September 9, 2019). <http://www.oica.net/category/production-statistics/2018-statistics/>.

<sup>463</sup> NAACAM, "Member Search" (accessed September 9, 2019).

<sup>464</sup> Automotive World, "Engine Plant Database—2019 Edition," May 23, 2019.

<https://www.automotiveworld.com/research/global-vehicle-engine-plant-database-2019-edition/>.

About one-third of the content in vehicles assembled in South Africa is produced domestically, though the content within specific vehicles varies, with some manufacturers claiming local content of more than 40 percent.<sup>465</sup> While specific data on parts manufacturing are not available, South Africa's largest parts exports are catalytic converters (see box 4.1), engine parts, and tires.<sup>466</sup> Vehicle manufacturers reportedly import high-value capital-intensive components including drivetrains and telematics, which account for 50 to 60 percent of the value of the vehicle, with much of the remaining content produced domestically.<sup>467</sup> Neighboring countries supply very little content; the only known regional suppliers are Lesotho (which supplies automotive seat covers to some vehicle manufacturers in South Africa) and Botswana (which supplies wire harnesses).<sup>468</sup> The remainder of the parts and components for the vehicles comes from outside the region, primarily Europe.<sup>469</sup>

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<sup>465</sup> UNCTAD, *Economic Development in Africa*, 2019, 156; IHS Markit, Global Trade Atlas database (accessed July 25, 2019).

<sup>466</sup> Lamprecht, *Automotive Export Manual 2019*, 2019, 83.

<sup>467</sup> Lamprecht, *Automotive Export Manual 2019*, 2019, 97.

<sup>468</sup> USITC, hearing transcript, July 24, 2019, 27–28 (testimony of Yoliswa Mvebe, South African Chargé d'Affaires ad Interim to the United States); Cokayne, "Fears for 600 Jobs," September 29, 2014.

<sup>469</sup> Industry representative, interview by USITC staff, Washington, DC, August 20, 2019; industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019; UNCTAD, *Economic Development in Africa*, 2019, 156; IHS Markit, Global Trade Atlas database (accessed July 25, 2019).

**Box 4.1** Cobalt: A Critical Input for the Global Electric Vehicle Supply Chain

As the world's largest source of mined cobalt, the Democratic Republic of the Congo (DRC) plays an important role in the global value chain for lithium-ion batteries (LIBs) used to power electric vehicles. Although the DRC supplies more than 60 percent of the world's mined cobalt, it lacks significant domestic refining capacity—accounting for less than 1 percent of global refining capacity in 2016. As a result, the DRC exports most of its ores and concentrates to China and other countries for further processing.<sup>a</sup> Cobalt is a key component for the cathode<sup>b</sup> in one of the most widely recognized battery types—LIBs—because cobalt provides a higher energy density than other available materials, thereby enhancing a battery's total run time.<sup>c</sup> This property is important for the electric vehicle manufacturing industry, where the demand is for lighter, more powerful batteries that can extend a vehicle's driving range.<sup>d</sup> According to one estimate, as more consumers adopt electric vehicles, demand for cobalt could rise to 300,000 metric tons by 2030—about three times the current production levels.<sup>e</sup>

The supply chain for the cobalt used in LIBs begins with the mining of cobalt ores and concentrates, which are typically found within much larger deposits of copper and nickel. In fact, in the DRC, most cobalt is sourced as a byproduct of copper mining operations. Once mined, the ore is transported to refineries where it is processed into cobalt-containing compounds (e.g., cobalt oxide, cobalt hydroxide, cobalt metal). These, along with other materials, make up the cathodes in LIBs.<sup>f</sup>

In early 2019, the government of the DRC notified major cobalt mining firms that it would introduce an export ban on cobalt and copper concentrates to promote domestic refining operations and retain a greater portion of the value chain. However, following the announcement, the country's National Federation of Enterprises notified the government that it would be very difficult for mining firms to process these concentrates in the DRC due to the country's insufficient energy supplies.<sup>g</sup> The refining process requires the direct use of electricity to extract cobalt from mined ores and concentrates, so cobalt refineries need access to reliable sources of energy.<sup>h</sup> The government responded to these concerns by delaying the export ban and announced that it would conduct a review every six months to determine whether it should reinstate the ban.<sup>i</sup>

If the DRC is able to establish a stable cobalt refining industry, it could retain a significant portion of the value added during the refining process. This would enable the country to directly supply battery manufacturers around the world, thereby competing with similar processors in China and other countries. Foreign investment would likely play an important role in the development of the DRC's cobalt refining industry, as is already evident with certain Chinese-built plants in the DRC that have come online in recent years,<sup>j</sup> though no U.S. firms are active in this industry in the DRC.<sup>k</sup>

U.S. firms are working with other firms to build transparency into the cobalt value chain. For example, in early 2019, Ford, IBM, LG Chem (a South Korean manufacturer of LIB cathodes), and Huayou Cobalt (a Chinese refiner of cobalt) partnered to develop the first blockchain project that will monitor cobalt sourced from the DRC. The purpose of this project is to ensure that LIB and electric vehicle manufacturers' supply chains comply with international child labor standards and do not finance conflict in the DRC and surrounding region. (For more information on the role of blockchain technology in global value chains, please see case study 6.2 in chapter 6.)

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<sup>a</sup> Shedd, “Cobalt,” February 2019; Cobalt Institute, “Production and Supply” (accessed September 19, 2019). According to the Cobalt Institute, the DRC accounted for less than 1 percent of global refined cobalt production in 2016. Cobalt Institute, “Production and Supply” (accessed September 19, 2019). Hunter and Luk, “DRC Bans Cobalt, Copper Concentrate Exports, Cutting off Zambia Trade,” March 20, 2019.

<sup>b</sup> There are three key components to a lithium-ion battery (LIB): the anode, the cathode, and the electrolyte.

<sup>c</sup> It should be noted that not all LIB chemistries use cobalt. Battery University, “The High-Power Lithium-ion” (accessed September 19, 2019); Battery University, “Is Li-ion the Solution for the Electric Vehicle?” (accessed September 19, 2019); Cobalt Institute, “Rechargeable Batteries” (accessed September 19, 2019).

<sup>d</sup> Ramsey, “Energy Density of EV and Gasoline Powertrains Will Converge,” May 18, 2016.

<sup>e</sup> A CRU International study commissioned by major cobalt producer Glencore estimated annual cobalt demand could exceed 300,000 metric tons by 2030 if electric vehicles obtain a 30 percent market share by that year. Glencore, *Responsibly Sourcing the Commodities*, 2018, 61.

<sup>f</sup> Bell, “Cobalt Metal: Properties, Production, and Application,” March 28, 2018; Cobalt Institute, “Rechargeable Batteries” (accessed September 19, 2019).

<sup>g</sup> Hunter and Luk, “DRC Bans Cobalt, Copper Concentrate Exports,” March 20, 2019.

<sup>h</sup> Bleiwas, *Estimates of Electricity Requirements for the Recovery of Mineral Commodities*, 2011, 1.

<sup>i</sup> Radford, Hunter, and Luk, “DRC U-turns on Cobalt, Copper Concentrate Export Ban,” March 21, 2019.

<sup>j</sup> Hunter and Luk, “DRC Bans Cobalt, Copper Concentrate Exports, Cutting off Zambia Trade,” March 20, 2019.

<sup>k</sup> Various Chinese firms have constructed cobalt processing plants in the DRC that convert cobalt ores and concentrates into cobalt hydroxide; however, miners continue to export significant amounts of cobalt concentrates to China. Hunter and Luk, “DRC Bans Cobalt, Copper Concentrate Exports, Cutting off Zambia Trade,” March 20, 2019. As of February 2020, there are no indications that U.S. firms are active or considering activity in cobalt processing in the DRC.

Although South Africa is the only SSA country that has integrated facilities for vehicle production, other countries—including Nigeria, Ghana, Kenya, Ethiopia, Namibia, Rwanda, and Zimbabwe—assemble motor vehicles from kits.<sup>470</sup> Kit assembly does not offer the same level of supply chain development as integrated manufacturing, since most of the motor vehicle components are imported as part of the kit rather than being sourced locally or imported from other countries in the supply chain.<sup>471</sup> Kit assembly also occurs at a much smaller scale than integrated manufacturing. Nigeria’s production is estimated to be less than 9,000 units per year, and Kenya produces between 5,000 and 10,000 units annually.<sup>472</sup> Nonetheless, many SSA countries are implementing policies to incentivize kit assembly with the goal of developing domestic manufacturing capability and boosting employment.<sup>473</sup>

U.S. automotive parts imported under the African Growth and Opportunity Act (AGOA)—including those imported under the Generalized System of Preferences (GSP)—made up nearly 60 percent of U.S. automotive parts imported from AGOA countries.<sup>474</sup> Those imports came almost entirely from South

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<sup>470</sup> While an exact number is not available, total kit production in SSA appears to be less than 25,000 units. Black, Makundi, and McLennan, “Africa’s Automotive Industry: Potential and Challenges,” September 2017; Brandt, “Walvis Bay’s Peugeot Assembly Plant Gearing Up,” February 4, 2019; Hetzner, “VW invests \$20 million in Rwanda’s First Car Plant,” June 27, 2018; Ibukun, “Volkswagen, Nissan to Get Tax Breaks,” August 15, 2019; *Herald* (Zimbabwe), “Willowvale Motor Industries Reopens,” March 28, 2017; Okoth, “Vehicle Assemblers Gear Up,” June 25; Olingo, “East Africa’s Motor Assembly Sector Raring to Fire,” March 5, 2018; and Owino, “Policy Pushing for Production of Locally Assembled Vehicles,” August 9, 2019.

<sup>471</sup> Industry representative, interview by USITC staff, Washington, DC, August 20, 2019.

<sup>472</sup> USDOC, “Nigeria—Automotive,” August 13, 2019; Okoth, “Vehicle Assemblers Gear Up for New Automotive Policy,” June 25.

<sup>473</sup> Ibukun, “Volkswagen, Nissan to Get Tax Breaks,” August 15, 2019; Kombo Ndubi, “Uhuru Kenyatta’s Effort to Place Kenya,” March 21, 2019; Okoth, “Vehicle Assemblers Gear Up,” June 25, 2019; Olingo, “East Africa’s Motor Assembly Sector Raring to Fire,” March 5, 2018; Owino, “Policy Pushing for Production of Locally Assembled Vehicles,” August 9, 2019.

<sup>474</sup> USITC DataWeb/USDOC (accessed October 31, 2019).

Africa. Roughly a third of U.S. AGOA automotive parts imports are parts and accessories not elsewhere specified, and a third are parts of mufflers.<sup>475</sup>

## U.S. Firms' Current Integration

### South Africa

Ford invested roughly \$1.0 billion in vehicle assembly and engine manufacturing in South Africa between 2009 and 2018,<sup>476</sup> including two greenfield projects during 2016–18. One project related to motor vehicle production, and another was an engine project.<sup>477</sup> Ford manufactures 400 vehicles per day in Pretoria and has the capacity to produce up to 168,000 vehicles per year of two models alone—the Ranger, a four-door pickup truck, and the Everest, a five-door SUV that is a variant of the Ranger. Ford employs approximately 4,300 people in South Africa, and estimates that its local operations support 50,000 jobs at suppliers in its value chain. Ford is also South Africa's leading exporter of light commercial vehicles; about two-thirds of the vehicles it manufactures in Pretoria are exported. Ford exports its South African-produced vehicles to 148 markets globally, including 24 African countries.<sup>478</sup>

There are at least 13 U.S. automotive parts suppliers operating in South Africa, employing over 12,300 people. These firms manufacture and supply original equipment components to vehicle assembly plants as well as produce replacement components for the aftermarket. For example, U.S. firms sell a variety of components that are inputs to vehicles, such as axles (Spicer Axle), engine products (Federal Mogul), seating systems (Adient and Lear), tires (Bridgestone and Goodyear), wheels (Maxion), and catalytic converters (Tenneco; see box 4.2).<sup>479</sup>

U.S. motor vehicle firms have also invested in employee and community development, such as the Ford Resource and Engagement Centre (FREC) near Ford's Pretoria plant. The FREC facility focuses on skills building for the local community through education and training programs and funds grants.<sup>480</sup> In addition, in 2011, Ford partnered with South Africa's Automotive Industry Development Centre to establish an incubator that trains and supports black-owned firms starting up as automotive parts suppliers. The Automotive Incubation Centre houses entrepreneurs who perform value-added subassembly work on components that are input directly to Ford's production line. The incubating companies are subcontracted to some of Ford's suppliers, which offer technical mentoring to workers at the center.<sup>481</sup>

<sup>475</sup> USITC DataWeb/USDOC (accessed October 31, 2019).

<sup>476</sup> U.S. dollar (USD) value based on average exchange rate between the USD and ZAR from January 2, 2008, through December 31, 2018. Federal Reserve, Foreign Exchange Rates, October 15, 2019; Ford, "Ford's Expansion Unleashes New Potential for South Africa," June 2019.

<sup>477</sup> *Financial Times*, fDi Markets database (accessed August 30, 2019); Ford, "Ford Invests \$170 Million in South Africa," April 5, 2016; Ford, "Ford Expands Engine Assembly Operations at Struandale," March 27, 2018.

<sup>478</sup> Ford, "Ford's Expansion Unleashes New Potential for South Africa," June 2019.

<sup>479</sup> NAACAM, "Member Search" (accessed September 6, 2019).

<sup>480</sup> Ford, "Ford's Expansion Unleashes New Potential for South Africa," June 2019.

<sup>481</sup> AIDC, "Incubation Programmes" (accessed September 10, 2019); AIDC, "AIDC in Partnership with Ford," September 3, 2015.

## Nigeria

Nigeria is the only country in SSA to have a U.S. firm that assembles motor vehicles using kits. Specifically, Ford assembles Ranger models from kits in Ikeja outside of Lagos, where it began assembling in 2015. Ford imports semi-knockdown body parts and components for the Ranger from South Africa, and then assembles the vehicles through a joint operation with Cocharis Motors for domestic Nigerian sale. Ford has the capacity to assemble approximately 5,000 Rangers per year in Nigeria in this way. The assembly plant in Nigeria is estimated to support about 180 jobs directly and indirectly.<sup>482</sup>

## Opportunities and Challenges

The lack of integrated automobile manufacturing outside of South Africa is an important reason why U.S. automotive companies have limited investments in SSA.<sup>483</sup> It is also notable that General Motors and French manufacturer Citroën have both exited the South African market in recent years.<sup>484</sup> Opportunities and constraints for future U.S. investment and supply chain integration, both in South Africa and the SSA region as a whole, are dictated by three major factors: market size and regional integration, manufacturing capability, and government policies.<sup>485</sup>

## Market Size and Regional Integration

A sufficiently large market that is integrated with the regional market is necessary for U.S. automotive firms to justify the large capital investment required to further develop the SSA automotive supply chain.<sup>486</sup> The market in SSA is relatively small, and demand for new vehicles is limited by the low purchasing power of customers, financing hurdles such as high interest rates for loans, and the overall poor quality of roads.<sup>487</sup> The price competitiveness of secondhand vehicles means that imports of used vehicles dominate the market.<sup>488</sup> However, the continent is widely regarded as having untapped potential for the automotive industry in the long term.<sup>489</sup>

Regional integration will likely enhance the prospects for future U.S. investment in the SSA automotive supply chain. South Africa has been a hub for automotive exports to the rest of the continent, but the low level of auto parts imports from other SSA countries indicates an underdeveloped regional value chain.<sup>490</sup> However, one notable sign of movement toward the development of such a chain within the South African Customs Union is the recent relocation of the manufacturing of certain components from South Africa to neighboring countries with lower labor costs. For example, in 2016, Pasdec (a Malaysian

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<sup>482</sup> Business Wire, “Ford Will Assemble Best-selling Ranger Trucks in Nigeria,” August 2015.

<sup>483</sup> Markowitz, “The Potential for Regional Value Chains,” June 2016.

<sup>484</sup> Chutel, “South Africa Is Taking its Breakup with General Motors Badly,” May 19, 2017.

<sup>485</sup> Black, Makundi, and McLennan, “Africa’s Automotive Industry: Potential and Challenges,” September 2017; Markowitz, “The Potential for Regional Value Chains,” June 2016.

<sup>486</sup> UNCTAD, *Economic Development in Africa Report 2019*, June 2019.

<sup>487</sup> UNCTAD, *Economic Development in Africa Report 2019*, June 2019.

<sup>488</sup> Deloitte, “Navigating the African Automotive Sector,” 2018.

<sup>489</sup> Deloitte, “Navigating the African Automotive Sector,” 2018.

<sup>490</sup> Markowitz, “The Potential for Regional Value Chains,” June 2016.

wire harness producer) began operations in Lobatse, Botswana, and now manufactures and supplies parts to Nissan South Africa.<sup>491</sup> The availability of lower-cost labor for component production and sourcing could incentivize additional U.S. automotive industry investment in Southern Africa.

## Manufacturing Capability

The lack of manufacturing capability, including infrastructure and skilled labor, in SSA presents a challenge for U.S. automotive firms investing in the region. Infrastructure for transport in SSA is insufficient to support a fully developed manufacturing industry and attract significant U.S. automotive investment outside of South Africa. This is a major factor for the automotive industry, because it operates on a “just in time” basis that requires suppliers to deliver components when they are needed in original equipment manufacturer (OEM) assembly. Thus, the supply chain relies on close geographical proximity or good transport links to ensure efficient production.<sup>492</sup>

The high-quality standards that the automotive industry requires for vehicles means that even more specialized skills are needed. However, few workers have such skills in SSA. For example, on occasions when a component plant in Botswana faced a high-level technical issue, workers at the plant had to wait for an expert to arrive from South Africa to resolve the issue because they did not have adequate knowledge to do so.<sup>493</sup> Investments in technical education in SSA, such as the Automotive Incubation Centre described above, could help develop a more skilled manufacturing workforce.

## Government Policies

In general, the governments of SSA countries have attempted to attract FDI to develop their automotive industries and are creating policies to incentivize domestic production, which present opportunities for U.S. firms. Some countries, such as South Africa, have used policies to successfully attract U.S. FDI. South Africa’s applied import tariff rates on motor vehicle parts (TE010) is almost 20 percent.<sup>494</sup> This policy may create some incentive for firms operating in South Africa to import motor vehicle parts and complete assembly in South Africa instead of importing assembled vehicles from elsewhere, which aids in the development of the South African automotive industry. However, other SSA countries have struggled to balance the protection of domestic auto industries with engagement in global supply chains, which can have a mixed effect on U.S. firms.

The Automotive Production and Development Programme (APDP) in South Africa was established in 2013 and renewed in 2018 with the goal of expanding the market and building a domestic supplier

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<sup>491</sup> USITC hearing transcript, July 24, 2019 (testimony of Yoliswas Mvebe, Embassy of the Republic of South Africa); Dube, “Lobatse Automotive Plant Readies for Operations,” March 4, 2016; *The Star Online*, “Pasdec enters RM380m Manufacturing Contract with Nissan,” October 11, 2018.

<sup>492</sup> Markowitz, “The Potential for Regional Value Chains,” June 2016, 19.

<sup>493</sup> Markowitz, “The Potential for Regional Value Chains,” June 2016, 19.

<sup>494</sup> WTO, Tariff Analysis Online (accessed March 4, 2020).

base.<sup>495</sup> Since members of the Southern African Customs Union<sup>496</sup> enjoy duty-free access to South Africa and have the same external tariff regime as South Africa, the APDP encourages the development of regional supply chains.<sup>497</sup> According to South African officials, the policy has supported investments of \$661 million annually.<sup>498</sup> Additionally, the Broad-Based Black Economic Empowerment (B-BBEE) policy in South Africa also affects motor vehicle investment in the country, although the net impact on U.S. firms is unknown.<sup>499</sup> The stated objective of B-BBEE is to promote employment and development for the previously disadvantaged black population.<sup>500</sup> Therefore, in order to comply with B-BBEE, motor vehicle manufacturers have invested in worker development at domestically owned parts supply companies.<sup>501</sup> For example, Ford and Nissan created incubation centers in support of B-BBEE.<sup>502</sup>

The Nigerian Automotive Investment Development Plan (NAIDP) was announced in 2013 with the goal of developing domestic production.<sup>503</sup> The policy increases the cost of importing fully built vehicles and encourages local assembly of semi-knockdown kits. However, further supply chain linkages have yet to develop. The NAIDP restricts foreign exchange access to importers of certain product lines, including glass and rubber products. This restriction rule aims to build a domestic vehicle supplier industry, but it has limited assemblers' ability to access key inputs because the domestic supply of such products is too small to support local production.<sup>504</sup> On the other hand, the NAIDP allows companies with kit-manufacturing operations in Nigeria to import two vehicles for every one kit at a reduced effective tariff rate. As a result, various automotive manufacturers, including Ford, have begun kit assembly in Nigeria since the NAIDP was announced.<sup>505</sup>

Other SSA countries have also started to develop policies giving foreign companies incentives to invest in automotive kit assembly and create the potential for U.S. firms to integrate into these infant

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<sup>495</sup> The APDP includes a cash grant program for capital equipment investments, a stable tariff regime, and two duty-offsetting mechanisms to incentivize domestic manufacturing. The APDP duty-offsetting mechanisms include a production incentive based on manufacturing value added and a volume assembly allowance based on the number of vehicles on the assembly line. Venter, "New-look APDP Could Change Face," February 1, 2019.

<sup>496</sup> Membership in the South African Customs Union includes Botswana, Eswatini, Lesotho, South Africa, and Namibia.

<sup>497</sup> While APDP encourages regional supply chain development, countries other than South Africa may not yet have the industrial capacity to take advantage of this policy. Markowitz, "The Potential for Regional Value Chains," June 2016.

<sup>498</sup> U.S. dollar value based on average exchange rate between USD and ZAR from January 2, 2013, through December 31, 2018. Federal Reserve, Foreign Exchange Rates, October 15, 2019. SA News, "Local Content to Move Automotive Industry Forward," November 23, 2018.

<sup>499</sup> Industry representative, interview by USITC staff, Washington, DC, August 20, 2019.

<sup>500</sup> Government of South Africa, B-BBEE Commission website (accessed March 13, 2020).

<sup>501</sup> Industry representative, interview by USITC staff, Washington, DC, August 20, 2019.

<sup>502</sup> AIDC, "Incubation Programmes" (accessed September 10, 2019).

<sup>503</sup> The NAIDP includes sliding-scale tariffs and levies as well as an import ban on vehicles older than 15 years. The effective tariff on automobile imports into Nigeria is 70 percent, and the import ban on older used vehicles has the tendency to encourage smuggling through Benin. Deloitte, "Navigating the African Automotive Sector," 2018; USDOC, "Nigeria—Import Tariffs," August 13, 2019.

<sup>504</sup> Deloitte, "Navigating the African Automotive Sector," 2018.

<sup>505</sup> Akwagyiram and Oluocha, "Nigeria Tariff Causes Car Imports to Fall," December 15, 2017; *Guardian* (Nigeria), "5 Made-in-Nigeria Cars You Would Love," April 13, 2018; Alade, "Nigeria: Ford Assembly Plant Berths in Lagos," October 20, 2017.

industries. The Kenyan government is processing a new automotive policy to revitalize local production,<sup>506</sup> and foreign automotive assemblers are reportedly optimistic about the prospects for further growth and investment in the country.<sup>507</sup> In 2019, Ghana announced tax breaks for automakers that establish local manufacturing plants; following that announcement, several international manufacturers announced plans to build kit-assembly facilities.<sup>508</sup>

Automotive preferential trade agreements between South Africa, the Southern African Development Community (SADC),<sup>509</sup> and the European Union (EU) have attracted European motor vehicle investments in South Africa and developed a strong trading relationship.<sup>510</sup> The EU-SADC agreement's rules of origin help facilitate intra-regional trade and industrialization by offering duty-free access to the European market. The resulting supply chain integration has created opportunities for firms operating in the EU.<sup>511</sup> Over half of South African exports of motor vehicle and parts, such as catalytic converters (see box 4.2), in 2018 went to the EU, and the value of those exports increased 22.3 percent from 2016 to 2018.<sup>512</sup>

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<sup>506</sup> Kenya's automotive policy lowers the age limit on imported used cars and puts other import constraints on used vehicles and certain parts. Okoth, "Vehicle Assemblers Gear Up," June 25, 2019; Owino, "Policy Pushing for Production of Locally Assembled Vehicles," August 9, 2019.

<sup>507</sup> Olingo, "East Africa's Motor Assembly Sector Raring to Fire," March 5, 2018.

<sup>508</sup> Ibukun, "Volkswagen, Nissan to Get Tax Breaks," August 15, 2019.

<sup>509</sup> SADC membership includes Botswana, Eswatini, Lesotho, Mozambique, Namibia, and South Africa.

<sup>510</sup> Lamprecht, *Automotive Export Manual 2019*, 2019.

<sup>511</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019.

<sup>512</sup> U.S. dollar value based on average exchange rate between USD and ZAR from January 2, 2018, through December 31, 2018. Federal Reserve, "Foreign Exchange Rates," October 15, 2019; Lamprecht, *Automotive Export Manual 2019*, 2019.

**Box 4.2 Catalytic Converters: U.S. Firms Make Significant Investments in South Africa**

The global catalytic converter industry is composed primarily of global multinational manufacturers that supply original equipment manufacturers (OEMs). Many OEM production facilities are located in South Africa. South Africa's catalytic converter industry was established in the early 1990s, and since then the country has grown to become a major exporter of these goods. More than 85 percent of the content of catalytic converter production in South Africa is sourced domestically.<sup>a</sup> The high domestic content is mainly due to South Africa's leading position as a producer of platinum group metals (platinum, palladium, and rhodium), which are essential inputs into catalytic converter production. South Africa is the world's largest producer of platinum and rhodium, and the second-largest producer of palladium.<sup>b</sup>

Several U.S.-based companies—including General Motors, Tenneco, and Corning—have made significant investments in South Africa's catalytic converter industry. In 2000, Corning opened a catalytic converter facility in South Africa, where it focused on producing the substrate products used as the core of catalytic converters.<sup>c</sup> The substrates produced by Corning in South Africa are used in emissions control systems in many car and truck models produced in Europe, Asia, and North America.<sup>d</sup> General Motors also awarded General Motors South Africa (GMSA) and Tenneco South Africa a contract to supply catalytic converters for use in V-6 engine vehicles manufactured in North America.<sup>e</sup> GMSA appears to be the largest exporter of catalytic converters from South Africa, but Ford and Eberspacher also supplied catalytic converters from their plants in South Africa to the United States during 2014–18.<sup>f</sup>

South Africa is the largest supplier of catalytic converters in SSA and the second-largest global supplier (behind Mexico) of catalytic converters to the United States. Between 2014 and 2018, U.S. imports of catalytic converters (under HTS 8421.39.40) from South Africa ranged from a high of \$321 million in 2015 to a low of \$155 million in 2017. Nearly all U.S. imports of catalytic converters from SSA came from South Africa. Between 2014 and 2018, U.S. imports of catalytic converters from South Africa rose from approximately 1.4 million to 2 million units.<sup>g</sup>

Increasing global passenger car production coupled with the rising stringency in emission controls in European and North American countries has driven the demand for catalytic converters in recent years.<sup>h</sup> For example, the United States mandates that aftermarket catalytic converters—those not manufactured and supplied by OEMs—meet certain performance requirements for emission reduction in order to be sold.<sup>i</sup>

<sup>a</sup> NAACAM, “Supply Chain Partners Collaborate,” March 28, 2017.

<sup>b</sup> In 2018, South Africa accounted for 73 percent of global platinum production, 36 percent of palladium production, and 82 percent of rhodium production. Johnson Matthey, *PGM Market Report May 2019*, May 2019, 19, 27, 35.

<sup>c</sup> In 2000, the investment was reported to be worth \$30 million. DieselNet, “Corning Opens Catalytic Converter Substrate Plant in South Africa” (accessed September 21, 2019).

<sup>d</sup> Corning, Inc. “Corning Recognized as a Top Global Supplier by Daimler,” March 7, 2019.

<sup>e</sup> Tenneco Inc. is a U.S.-based auto parts producer with plants in multiple locations, including South Africa. GM, “GM Awards R6 Billion Export Programme to Local Unit,” June 27, 2013; HeraldLIVE (South Africa), “Motor, Catalytic Converter Firms Hold Breath for End to Dispute,” June 13, 2014; Cokayne, “GMSA, Tenneco Win R6bn Order,” July 3, 2013; Trade Data Information Services, Inc., Import Genius database (accessed September 23, 2019); Tenneco Inc., “Facilities Directory.” (accessed September 23, 2019).

<sup>f</sup> Trade Data Services, Import Genius database (accessed December 5, 2017); Brand South Africa, “Ford Secures Africa Export Contract,” May 8, 2008; Eberspächer, “Subsidiary” (accessed September 23, 2019).

<sup>g</sup> USITC DataWeb/USDOC, HTS 8421.39.40 (accessed October 21, 2019).

<sup>h</sup> Markets and Markets, “Catalytic Converter Market worth \$73.1 billion by 2025,” March 15, 2019.

<sup>i</sup> USEPA, National Service Center for Environmental Publications, “What You Should Know” (accessed September 15, 2019).

## Case Study 4.2: Petroleum and Natural Gas Extraction

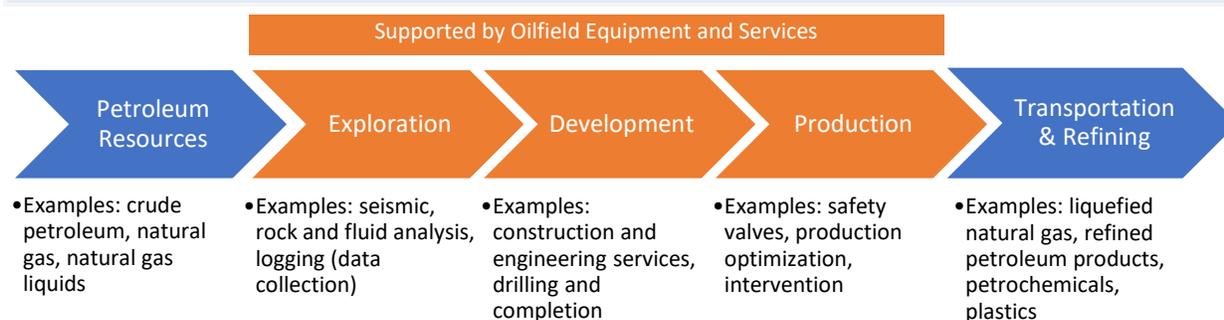
### Overview

The petroleum and natural gas extraction value chain consists of the exploration, development, and production of crude petroleum, as well as of natural gas and natural gas liquids (NGLs) (figure 4.3).<sup>513</sup> In SSA, the key countries involved are Nigeria and Angola, with many other smaller producers and some countries such as Ghana and Mozambique emerging as new hotspots of activity. SSA’s petroleum and natural gas extraction value chain shares many of the same traits as those of the rest of the world. However, country-specific factors such as resource abundance, the political environment, and regulations significantly affect SSA countries’ ability to attract investment for the large, technically complex projects that heavily involve U.S. firms. Figure 4.3 depicts this value chain, highlighting the extraction segments (exploration, development, and production) and their supporting oilfield equipment and services that are the focus of this case study.

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<sup>513</sup> See chapter 2 section “Natural Gas and Components” for more information on NGLs. Exploration requires gathering and analyzing data on where resources are located, while development focuses on the design and construction of a production well.

**Figure 4.3** Petroleum and natural gas extraction value chain



Source: Hilyard, *The Oil and Gas Industry: A Nontechnical Guide*, 2012; Tordo, “National Oil Companies and Value Creation,” 2011.

The extraction of crude petroleum, natural gas, and natural gas liquids is classified into projects that are either onshore or offshore; most of SSA’s petroleum and natural gas extraction is offshore.<sup>514</sup> Onshore oil and gas projects are typically less complex and expensive to develop, while offshore projects—especially deepwater and ultra-deepwater projects that need to drill greater distances—tend to take longer to develop and require larger investments.<sup>515</sup> For example, the development of offshore resources in Ghana in the late 2000s was a \$3.3 billion project with a 42-month timeframe between the crude petroleum discovery and the development of commercial production. (The timeframe was considered “one of the shortest cycles” for an offshore project of that scale and drilling depth).<sup>516</sup>

An offshore petroleum or natural gas extraction project includes multiple investors and stakeholders, with an experienced international oil company typically designated as the project’s operator. Operators contract out certain portions of a project to oilfield equipment and services providers and engineering firms. In SSA, operators are often encouraged by governments to partner with state-owned national oil companies and to provide contracts to domestic companies whenever possible. Global petroleum production has increasingly shifted towards larger projects extracting resources from less conventional sources, such as ultra-deepwater offshore projects in SSA and elsewhere, as well as tight formations and oil sands elsewhere.<sup>517</sup> This trend has increased the average technical requirements for project operators and the average size of the project investments.<sup>518</sup>

Beyond onshore and offshore, projects can also be classified by the petroleum or natural gas resources that are being extracted. Producers tend to target crude petroleum, which is higher value and often

<sup>514</sup> “Onshore” refers to the development of oil fields and gas deposits on land, while “offshore” refers to oil fields and gas deposits found in bodies of water, below the seafloor. U.S. industry representative, telephone interview by USITC staff, October 1, 2019.

<sup>515</sup> Offshore projects pose greater technical challenges, with factors such as water depth, well depth, and reservoir pressure and temperature driving the high drilling costs. EIA, *Trends in U.S. Oil and Natural Gas Upstream Costs*, March 2016, 5.

<sup>516</sup> Business Wire, “Kosmos Energy Celebrates First Oil,” December 15, 2010.

<sup>517</sup> Tight formation refers to low-permeability geologic formations such as shale rock or tight sandstone. Yergin, *The Quest*, 2011, 242–62.

<sup>518</sup> Megaprojects have also become larger over the past couple decades, often costing billions of dollars. Yergin, *The Quest*, 2011, 98; EY, “Spotlight on Oil and Gas Megaprojects,” 2014.

found in deposits with natural gas. However, producers also may directly target natural gas by developing deposits of nonassociated gas (i.e., natural gas deposits that do not contain any crude). Because crude petroleum and natural gas are found in the same types of formations and are often produced together, the extraction value chain for nonassociated gas involves many of the same companies, equipment, and services. One key difference is that a nonassociated gas project faces higher infrastructure requirements, since natural gas is more dependent on pipeline transportation than crude petroleum. Liquefied natural gas (LNG) facilities are expensive to develop, but enable natural gas to be transported much more efficiently over long distances and across oceans.<sup>519</sup> LNG infrastructure provides important market opportunities for natural gas, as does the development of local downstream uses for natural gas (such as gas-fired power generation and other industrial applications). Both are important incentives for developing offshore gasfields.<sup>520</sup>

While this case study focuses on petroleum and natural gas extraction, some SSA countries are involved in a broader value chain in the manufacturing of petroleum products.<sup>521</sup> Petroleum refineries transform crude petroleum into downstream products such as gasoline, diesel, and jet fuel, while petrochemical plants use certain refined petroleum products as well as NGLs to make a wide variety of materials, including plastics and paints.<sup>522</sup> The SSA refining sector is relatively small; therefore, the majority of SSA crude is exported outside the region for refining.

Sub-Saharan Africa makes up a relatively small share of the global petroleum and natural gas extraction value chain, but the economies of several SSA countries rely on this sector heavily, as it is one of their main sources of revenue. As of 2018, SSA contributed less than 6 percent of global crude petroleum production and less than 2 percent of global natural gas production.<sup>523</sup> Nevertheless, oil rents totaled over a third of the Republic of the Congo's GDP in 2017, and over 15 percent of the GDP for Equatorial Guinea, Angola, Gabon, and Chad.<sup>524</sup>

The petroleum and natural gas extraction value chain is concentrated in a few SSA countries with the most abundant petroleum resources. In particular, Nigeria has a robust domestic industry, with over 200 local operators and oilfield services companies and substantial onshore and offshore resources.<sup>525</sup> Nigeria and Angola are by far SSA's leading producers of crude petroleum and natural gas; they also lead

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<sup>519</sup> Liquefying natural gas can reduce its volume by a factor of more than 600, increasing its energy density and concentrating its dollar value. Hilyard, *The Oil and Gas Industry: A Nontechnical Guide*, 2012, 179.

<sup>520</sup> When sufficient natural gas transportation infrastructure is not available, crude petroleum producers often dispose of associated natural gas production by flaring it, reinjecting the gas into the ground, or using it as a fuel to power local production activities. Lewis, "Côte d'Ivoire's Deep Ambitions," September 29, 2017.

<sup>521</sup> Most of SSA's downstream petroleum activity is concentrated in South Africa and Nigeria. OPEC, "Table 4.3" and "Table 4.4," June 2019.

<sup>522</sup> Unlike crude petroleum, natural gas can be directly consumed as a fuel for heat or generating electricity; it also is sometimes used as an input for manufacturing chemicals and fertilizer. EIA, "Natural Gas Explained," July 10, 2019; AFPM, "Petrochemicals" (accessed October 21, 2019).

<sup>523</sup> Percentages based on African production excluding Algeria, Egypt, and Libya. OPEC, "Table 3.5" and "Table 9.3," June 2019.

<sup>524</sup> Oil rents are defined as the difference between the value of crude oil production at world prices and the total costs of production. World Bank, "Oil Rents (% of GDP)" (accessed October 22, 2019).

<sup>525</sup> U.S. industry representative, telephone interview by USITC staff, October 1, 2019.

SSA in undeveloped crude petroleum resources.<sup>526</sup> The Republic of the Congo, Equatorial Guinea, and Gabon also have a mature upstream petroleum industry, but with substantially lower levels of production and fewer untapped resources.<sup>527</sup> These five countries are all members of the Organization of the Petroleum Exporting Countries (OPEC). Several other countries along Africa's west coast have small but mature petroleum industries, such as Côte d'Ivoire and, to a lesser extent, Cameroon.<sup>528</sup>

Over the past five years, there has been additional activity in SSA countries in Western, Southern, and Eastern Africa with limited petroleum extraction experience.<sup>529</sup> Mozambique has been an early mover in capitalizing on its offshore natural gas discoveries, supported by its success attracting investments in LNG projects. Angola, the Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Madagascar (for the first time offshore), Mauritania, Nigeria, Senegal, Sierra Leone, Somalia, Tanzania, and Uganda all held offshore licensing auctions between 2018 and 2019.<sup>530</sup> Unlike other SSA countries, South Africa has developed a significant downstream industry (including petroleum refineries and petrochemical facilities) but does not currently have a large upstream extraction value chain.<sup>531</sup> Table 4.12 shows examples of recent U.S. firm activity supporting SSA's petroleum extraction value chain, as well as major oil and gas discoveries within SSA and major natural gas projects that are either planned or under development.

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<sup>526</sup> Botes, Lane, and Edinger, "The New Frontier: Winning in the African Oil and Gas Industry," March 15, 2019.

<sup>527</sup> SARPD Oil announced a large discovery in the Republic of the Congo, in August 2019, which could revise the country's resource potential. Wood Mackenzie, email message to USITC staff, February 7, 2020; Botes, Lane, and Edinger, "The New Frontier: Winning in the African Oil and Gas Industry," March 15, 2019.

<sup>528</sup> Lewis, "Côte d'Ivoire's Exploration Drive Rebooted," January 12, 2018; Perenco, "Cameroon" (accessed September 25, 2019).

<sup>529</sup> Wood Mackenzie, email message to USITC staff, February 7, 2020.

<sup>530</sup> Beckman, "Sub-Saharan Africa Opening Up," April 1, 2019. The Madagascar region has remained under-explored, although it shares a maritime border with Mozambique. Studies recently conducted in this border area show a potential for future onshore and offshore discoveries of gas and oil.

<sup>531</sup> There have been a few significant natural gas discoveries in South Africa—such as the Brulpadda offshore gas discovery and onshore shale gas in the Karoo—but these have not yet been developed. Lewis, "Can Brulpadda Find Deliver on High Hopes?" May 23, 2019; Mathe, "Gwede Keeps Options Open," July 12, 2019.

**Table 4.12** Recent developments in SSA countries, 2016–19

Country	U.S. firm	Recent Developments
<b>Projects for petroleum extraction</b>		
Angola	Exxon Mobil	ExxonMobil will invest in the Kizomba Project (a mature field) to increase production capacity. The project will generate approximately 1,000 local jobs.
Angola	Baker Hughes	Baker Hughes (BHGE) opened a facility in Luanda, Angola, to support multiple products and services across the oil and gas value chain that will primarily employ highly skilled Angolans.
<b>Major oil and gas discoveries</b>		
South Africa	–	In February 2019, Total SA announced South Africa’s first deepwater discovery of oil and gas, from the Brulpadda well in the Outeniqua Basin.
Angola	–	In March 2019, Eni announced a major deepwater petroleum discovery in the Agogo prospect.
Ghana	–	In May 2019, Eni announced a gas and condensate discovery offshore in the Akoma prospect.
Mauritania	Kosmos Energy	In October 2019, Kosmos Energy announced a major natural gas discovery off the shore of Mauritania at the Orca-1 well.
<b>Projects for natural gas extraction and transportation</b>		
Mozambique	–	African Renaissance Project pipeline, which starts in Rovuma Basin in northern Mozambique and ends in Gauteng province in South Africa, expects to commence operations in 2021. The project has experienced delays due to a switch in the shareholders and political environment. The financing requirements for the pre-investment and engineering phases have been confirmed.
Mozambique	Anadarko	In June 2019, the Anadarko-led Area 1 Mozambique LNG project (acquired by Total) advanced to the construction phase. The project supports the development of the Golfinho/Atum fields.
Nigeria	–	The Trans-Saharan Gas project pipeline, which starts in Nigeria and runs north through Niger to Algeria, is still waiting for a final investment decision. If completed, the pipeline would connect to other existing pipelines in Algeria supplying Europe. The project has experienced several delays since its budget approval in 2013, including a missed start date of 2018. Total and Gazprom are concerned about cost and security along the pipeline route.
Mauritania and Senegal	TechnipFMC	Various contracts were awarded for the offshore Greater Tortue Ahmeyim natural gas project, including the two projects listed below with McDermott and Baker Hughes.
Mauritania and Senegal	McDermott	Awarded a contract for engineering, procurement, construction, installation and commissioning of floating production storage and offloading to TechnipFMC.
Mauritania and Senegal	Baker Hughes	Awarded a contract for subsea equipment and subsea production systems to McDermott and Baker Hughes.

Source: Compiled by USITC from *World Oil*, Hydrocarbons Technology, and MarketWatch.

## U.S. Firms’ Current Integration

U.S.-based firms have operated alongside other major international companies in SSA and play an important role in developing and growing petroleum and natural gas extraction value chains in SSA. The largest international oil companies, referred to as the supermajors, each operate projects in SSA and consist of BP (United Kingdom), Chevron (United States), Eni (Italy), ExxonMobil (United States), Royal

Dutch Shell (Netherlands/United Kingdom), and Total (France). Although several SSA countries have developed robust networks of domestic oilfield services companies to support local projects, many offshore projects require broad technical expertise that is only available from the top global oilfield services providers (e.g., Baker Hughes, Halliburton, and Schlumberger).<sup>532</sup> As a major producer and consumer of petroleum, the United States has an extensive network of companies involved in the petroleum and natural gas extraction value chain, primarily based out of Houston, Texas.<sup>533</sup>

Several more specialized companies have also played important roles in supporting SSA projects: Anadarko (United States), Kosmos Energy (United States), and Tullow Oil (United Kingdom) have made major discoveries exploring for petroleum and natural gas in SSA, while companies such as Aquaterra Energy (United Kingdom), McDermott (United States) and TechnipFMC (France/United States) specialize in providing subsea<sup>534</sup> equipment and engineering services.<sup>535</sup> National oil companies involved in SSA include the Nigerian National Petroleum Company (NNPC), Angola's Sonangol and Somoil, Mauritania's Société Mauritanienne des Hydrocarbures et de Patrimoine Minier, Mozambique's Empresa Nacional de Hidrocarbonetos, and South Africa's PetroSA.

Overall, multibillion-dollar megaprojects tend to drive broader investment trends in SSA's petroleum extraction sector. Between 2017 and 2019, Anadarko and ExxonMobil made major investments in Mozambique LNG, and Kosmos Energy announced a final investment decision with partner BP in Mauritania and Senegal. At the same time, non-U.S. firms such as Eni, Tullow, and Total (which acquired Anadarko's SSA assets in 2019) have also been leading major projects in SSA. ExxonMobil's Rovuma LNG project is estimated to cost \$23.6 billion, and the company awarded a \$13 billion contract in October 2019 to U.S. firms Fluor Corporation and TechnipFMC and Japanese firm JGC Holdings for building the LNG plant.<sup>536</sup> The U.S. Export-Import Bank also is supporting Anadarko's LNG project in Mozambique, authorizing a loan of up to \$5 billion for U.S. exports of goods and services.<sup>537</sup>

Some U.S. firms have also made smaller investments in SSA, expanding their corporate and sales offices in SSA; opening and expanding facilities for supplying oilfield services and equipment maintenance; and opening a research center to train local workers. Investments in offices and service centers generally were made after the company had reached an important milestone either supporting a project or conducting exploration in the country.<sup>538</sup> Examples of recent greenfield project investments are shown

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<sup>532</sup> Industry representative, telephone interview by USITC staff, October 1, 2019; industry representative, interview by USITC staff, Washington, DC, December 13, 2019.

<sup>533</sup> Some firms in Houston, such as Schlumberger and TechnipFMC, have been formed through mergers of U.S.-based and foreign-based companies and have regional headquarters in multiple countries. Gilmer, "Proximity Counts: How Houston Dominates," August 22, 2018.

<sup>534</sup> Subsea refers to technology and activities used in offshore operations below the surface of the water.

<sup>535</sup> In May 2019, Total announced a binding agreement with Occidental to acquire Anadarko's assets in Africa. Total, "Total Agrees with Occidental," May 5, 2019; Reed, "Finding Success on the Oil Frontier," July 3, 2012. Occidental completed its acquisition of Anadarko in August 2019. Occidental, "Occidental Completes Acquisition of Anadarko," August 8, 2019.

<sup>536</sup> Nhamire and Hill, "Exxon Awards JGC, Others \$13 Billion," October 9, 2019.

<sup>537</sup> The loan is tied to the use of U.S. exports and therefore is not being affected by Total's acquisition. EXIM, "EXIM Approves \$5 Billion to Finance U.S. Exports," September 26, 2019.

<sup>538</sup> Sesema Public Relations, "FMC Technologies Expands Subsea Services Support," June 21, 2016; ExxonMobil, "ExxonMobil Acquires Exploration Acreage," December 4, 2017; Africa Oil & Power, "ExxonMobil to Run Its Largest 3D Seismic Campaign" (accessed October 21, 2019).

in the table below (table 4.13) and reflect some of the broader developments in SSA's petroleum extraction sector, as shown in table 4.12.

**Table 4.13** U.S. investment in SSA greenfield projects related to petroleum extraction, June 2015–June 2019

Project date	Investing company	Country	Description
June 2019	Baker Hughes	Angola	Expanded an existing subsea equipment manufacturing and testing facility to add broader oilfield services capabilities.
May 2019	ExxonMobil	Mauritania	Opened an office to support offshore exploration activities.
July 2018	ExxonMobil	Mozambique	Submitted development plan for the construction and operation of natural gas liquefaction facilities for Rovuma LNG.
November 2017	Halliburton	Nigeria	Partnered with the state government to open an oil and gas training and research center.
August 2017	Anadarko Petroleum	Mozambique	Announced plans to design, build, and operate marine facilities for an onshore LNG plant.
July 2016	FMC Technologies <sup>a</sup>	Nigeria	Opened a subsea services support center.
March 2016	ExxonMobil	Côte d'Ivoire	Opened an office to coordinate activities in Côte d'Ivoire and Liberia.
June 2015	Erin Energy	Nigeria	Conducted offshore exploration and production activities in Nigeria's Oyo field.

Source: fDi Markets (accessed September 23, 2019).

Note: The exact value of these investments is unreported.

<sup>a</sup> FMC Technologies merged with Technip in 2017, creating TechnipFMC.

An important part of the petroleum and natural gas extraction value chain is the procurement of construction and mining equipment<sup>539</sup> and materials that aid in drilling and transportation. For example, for the latter, oil country tubular goods (OCTG) and line pipe<sup>540</sup> are used primarily during the development phase (construction and drilling) of the petroleum and natural gas extraction value chain. The construction and mining equipment category showed an increase in the value of U.S. exports to SSA during 2016–18.<sup>541</sup> U.S. exports of OCTG and line pipe varied each year from 2016 to 2018 due to large fluctuations in project-specific demand; for example, U.S. exports to Ghana increased by \$23.4 million in 2017 and then fell to less than \$0.2 million in 2018.<sup>542</sup> Table 4.14 shows U.S. export of construction and mining equipment to SSA and OCTG and line pipe to SSA during 2016–18.

<sup>539</sup> The construction mining equipment category is not limited to petroleum and natural extraction.

<sup>540</sup> Oil country tubular goods (OCTG) are a category of pipe, casing, and tubing used in the petroleum industry. OCTG are often used when the well is drilled (typically during the development phase of the value chain); offshore projects are a key driver for OCTG demand and require higher-grade steel. Daleel, "OCTG (Casing & Tubing)" (accessed October 22, 2019). Line pipe is typically used to transport the product of the petroleum and natural gas extraction outside the well.

<sup>541</sup> The increase in value for the construction mining equipment category is not limited to petroleum and natural gas extraction.

<sup>542</sup> Nigeria and Equatorial Guinea were the largest sources of growth in U.S. exports of OCTG and line pipe to SSA during 2016–18 (up by \$10.8 million and \$4.8 million, respectively), while Angola was the source of the largest decline (down \$4.0 million). USITC DataWeb/USDOC (accessed November 4, 2019).

**Table 4.14** U.S. exports of construction and mining equipment and oil country tubular goods (OCTG) and line pipe to SSA, 2016–18.

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
	Million \$				2016–18
					%
Construction mining equipment	986.4	1114.8	1343.3	356.9	16.7
OCTG and line pipe	21.0	50.9	28.9	7.9	17.3

Source: Compiled from official statistics of USITC DataWeb/USDOC. The OCTG and line pipe category includes HTS statistical reporting numbers 7304.21.3000, 7304.21.6000, 7304.29.3055, 7304.29.6000, 7306.20.1500, 7306.20.2500, 7306.20.6000, 7306.20.8000, 7304.29.1055, 7304.29.5000, 7305.20.3000, 7305.20.7000, 7304.22.0000, 7304.23.3000, 7304.23.6000, 7304.24.1000, 7304.24.6000, 7304.29.3155, 7306.21.3500, 7304.29.6100, 7306.21.8000, 7306.29.1500, 7306.29.3000, 7306.29.6000, 7306.29.8100, 7304.10.1020, 7304.10.1050, 7304.10.1080, 7304.10.5020, 7304.10.5050, 7304.10.5080, 7306.10.1000, 7306.10.5000, 7305.11.1000, 7305.11.5000, 7305.12.1000, 7305.12.5000, 7305.19.1000, 7305.19.5000, 7304.19.1080, 7304.19.5080, 7304.19.1020, 7304.19.1050, 7304.19.5020, 7304.19.5050, 7304.11.0000, 7306.11.0000, 7306.19.1000, and 7306.19.5000.

## Opportunities and Challenges

Further U.S. integration in SSA’s petroleum and natural gas extraction value chain depends on global supply and demand factors as well as on regulatory developments and the economic and technical viability of resource endowments within each country. Continued petroleum development in Nigeria and Angola—along with new deepwater prospects in Ghana, Senegal, and Mauritania, and in-progress deepwater gas and LNG projects in Mozambique—provide opportunities for SSA’s petroleum and natural gas extraction sector to grow and attract more U.S. firm integration.

### Macroeconomic Factors

SSA’s petroleum and natural gas extraction projects must compete globally with other projects to attract investment; long-term uncertainties, low petroleum prices, and more attractive alternatives can prevent these projects from reaching a final investment decision. Many of the prospects in SSA are expensive deepwater projects that could take over a decade to recover costs. Uncertainties about the pace of transitioning away from more carbon-intensive forms of energy can raise the level of perceived risk of these investments. Two other factors—the steep drop in oil prices in 2014 and the tendency of project costs to increase when prices start to recover—add to investor concerns about the profitability of large deepwater investments. Moreover, U.S. shale projects offer a more attractive alternative: their production cycle is much shorter, and they are subject to more favorable fiscal terms.<sup>543</sup> Oil companies also have been increasing their investments in renewable energy projects, partly in response to investor concerns over environmental, social, and governance factors, thereby reducing the capital available for deepwater projects.<sup>544</sup>

<sup>543</sup> More favorable fiscal terms include, among others, lower borrowing costs and the lack of country risk factors such as currency risk. Ramsay, “Deepwater Struggles to Make Its Case,” May 21, 2019.

<sup>544</sup> Ramsay, “Deepwater Struggles to Make Its Case,” May 21, 2019; Kell, “The Remarkable Rise of ESG,” July 11, 2018.

## Regulatory and Other Country-specific Factors

The attractiveness of a particular petroleum or natural gas extraction project for investors also varies based on factors specific to the location: the relative abundance of the resource; marginal production costs; availability of existing petroleum and gas infrastructure; and the country's regulations, royalty and tax structures, and licensing and contract terms.<sup>545</sup> While SSA countries have limited control over resource availability and production costs, their governments have significant influence over the regulatory environment and expected returns on investment. Two examples of this are natural gas projects in Mozambique and Tanzania, and changes in petroleum extraction activity in Angola. Major offshore natural gas discoveries in the Rovuma basin spanned both Mozambique and Tanzania's maritime territory. However, projects in Mozambique have proceeded at a much faster pace, with LNG projects led by Anadarko and ExxonMobil reaching or nearing final investment decisions.<sup>546</sup> In contrast, since 2014, Tanzania's government has been in negotiations with international oil companies to develop an LNG project. The government's project requirements, national oil company partner risk, and confrontational dealings with foreign investors in the mining sector have made LNG investors more cautious.<sup>547</sup>

As another example, Angola's petroleum production fell substantially after the 2014 global price drop, but faces improving prospects following the 2017 election of President João Lourenço. The new president cut taxes on companies developing production from smaller marginal oilfields and reformed the national oil company Sonangol's structure. Some other nonregulatory factors, such as offshore discoveries by the Italian company Eni, have also improved Angola's outlook.<sup>548</sup> One industry representative indicated that Angola is a positive outlier for SSA in terms of production growth over the next few years and that its regulatory changes have helped renew international oil company activity.<sup>549</sup>

Nigeria continues to attract investment and U.S. firm involvement due to its vast resources, although some of its political and regulatory developments reduce its offshore potential. Nigeria's Petroleum Industry Bill was initially developed in 2008 and continues to face delays and revisions, leaving investors

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<sup>545</sup> Some countries in SSA also have high levels of political risk. Corruption is classified as an "extreme" risk in Angola, the Republic of the Congo, Mauritania, Mozambique, and Nigeria. Wood Mackenzie, email message to USITC staff, February 7, 2020.

<sup>546</sup> Anadarko announced a final investment decision (FID) for Mozambique LNG in 2019. ExxonMobil awarded \$13 billion in contracts for Rovuma LNG in October 2019, and is expected to reach a FID in 2020. Italian firm Eni also reached a FID on Coral LNG in 2017. Nhamire and Hill, "Exxon Awards JGC, Others \$13 Billion," October 9, 2019.

<sup>547</sup> Specifically, the Tanzanian government has stuck to higher requirements for domestic infrastructure development, government revenue share, and share of gas production allocated to the local market. The Tanzania Petroleum Development Corporation, a national oil company that could take a 25 percent stake in the project, is running behind schedule for developing a petroleum pipeline from Uganda. From mid-2017 to late 2019, the Tanzanian government was in disputes with gold mining firm Acacia, imposing an export ban on ore concentrate and claiming that the firm owed \$190 billion in back taxes. Lewis, "Tanzania Ups the Pace on LNG Project," December 17, 2018; Lewis, "Tanzania's LNG Dreams May Be Scuppered by Mistrust," July 18, 2019.

<sup>548</sup> Sonangol previously managed production-sharing agreements and had sole ownership rights to natural gas; reforms passed in 2018 under President Lourenço created a new independent agency to take over Sonangol's regulatory functions and opened up natural gas ownership rights to foreign investors. Smith, "Discoveries Boost Angola Upstream Mood," August 27, 2019; EIA, "Angola," June 7, 2019.

<sup>549</sup> U.S. industry representative, telephone interview by USITC staff, October 1, 2019.

in a position of uncertainty.<sup>550</sup> In October, Nigeria's National Assembly introduced and passed legislation increasing royalties on deepwater projects, providing a short-term revenue gain to the government but deterring future investment in these projects.<sup>551</sup> One major positive development is the settlement of debts owed by Nigerian National Petroleum Company (NNPC) to international oil company partners (including ExxonMobil and Chevron) and a shift to contracts that allow NNPC's partners to deduct their operations costs from NNPC's share of the profits.<sup>552</sup>

Ghana, Mauritania, and Senegal are markets where U.S. firms anticipate opportunities for growth.<sup>553</sup> Resource discoveries are a primary driver for this industry activity, while government actions have further supported growth. Ghana passed a Petroleum Bill in 2016 and received a favorable settlement of its maritime border dispute with Côte d'Ivoire in 2017, enabling petroleum projects on both sides of the border to move forward.<sup>554</sup> Likewise, the governments of Mauritania and Senegal have pledged to share revenue from natural gas projects spanning their maritime border.<sup>555</sup> Although both countries have relatively limited experience with petroleum and gas projects, the Senegalese government in particular is viewed as relatively stable and receptive to working with foreign investors and international oil companies.<sup>556</sup> However, limited available infrastructure and domestic industry experiences, increases both countries' requirements for imported equipment and partnerships with international oil companies and other multinationals to develop their natural gas resources.<sup>557</sup>

### Technological Factors

Technological improvements and structural cost reductions have opened up new opportunities in SSA's petroleum and natural gas extraction sector. Dynamic positioning systems for drillships operating in offshore areas with strong ocean movements, 4D seismic imaging capabilities, and digital technologies such as robotics and the Internet of Things (IoT) help identify and enable more production opportunities.<sup>558</sup> Many of these capabilities are being offered by international oil companies and specialized services companies, including U.S. firms.<sup>559</sup> Digitalization poses a significant opportunity for U.S. firm integration, as 30 percent of Africa's petroleum production is from mature fields that can

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<sup>550</sup> Salami and Oladoke, "Insight: Nigerian Petroleum Industry Fiscal Bill," June 5, 2019.

<sup>551</sup> Wood Mackenzie, email message to USITC staff, February 7, 2020.

<sup>552</sup> Previously, NNPC maintained "cash call" contracts where it would owe joint venture partners a share of the upfront investment costs. Reuters, "Nigeria's NNPC Says It Paid Debts," July 3, 2019; Argus, "Nigeria's NNPC Ends Cash-Call Agreements," December 16, 2016.

<sup>553</sup> While U.S.-based firms are not the operators for the major petroleum extraction projects in these countries, the large investments create many contract opportunities, particularly for oilfield services companies and specialized companies like TechnipFMC.

<sup>554</sup> Farge and Kpodo, "Court Ruling Favors Ghana," September 23, 2017.

<sup>555</sup> Melly, "Senegal and Mauritania Projects Make Headway," February 26, 2019.

<sup>556</sup> Lewis, "Slipping Off the Radar," July 13, 2016.

<sup>557</sup> USDOC, *2017 Top Markets Report*, 2017, 37–39.

<sup>558</sup> Lewis, "Maersk Drilling Eyes African Prizes," January 17, 2019; Botes, Lane, and Edinger, "The New Frontier: Winning in the African Oil and Gas Industry," March 15, 2019.

<sup>559</sup> For example, ExxonMobil has applied 4D seismic technology to deepwater projects in Angola. BP partnered with Baker Hughes to develop "digital twins" technology that helps monitor equipment and reduce unplanned downtime; BP piloted the technology in the Gulf of Mexico but plans to deploy it globally. ExxonMobil, "Discovering Hidden Hydrocarbons," September 13, 2018; Lammey, "BP, BHGE Raising Efficiency," May 9, 2018.

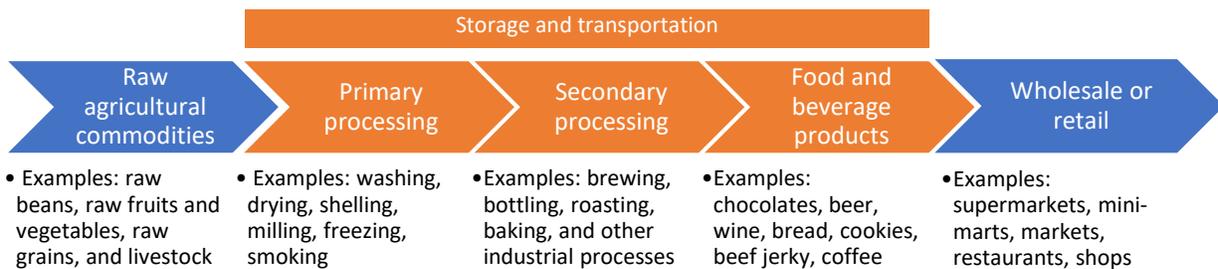
benefit from the application of digital technologies.<sup>560</sup> For example, the application of improved technology for seismic data imaging and analysis would help pinpoint opportunities for production near existing drill sites, leveraging existing infrastructure to bring new production online relatively quickly and cheaply.<sup>561</sup> Pressure to cut capital expenditures after the oil price drop in 2014 resulted in a structural reduction in costs, also helping SSA deepwater projects become more cost effective.<sup>562</sup>

## Case Study 4.3: Agrifood Processing

### Overview

In general, the agrifood processing value chain consists of five major stages: (1) raw agricultural commodities, (2) primary processing, (3) secondary processing, (4) food and beverage products, and (5) wholesale or retail (figure 4.4).<sup>563</sup>

**Figure 4.4** Agrifood processing value chain



Source: Compiled by USITC.

Traditionally, SSA countries have exported raw agricultural commodities or agricultural products with a minimal level of primary processing (e.g., cacao and coffee beans), and thus failed to capture the higher value generated in downstream operations. Developing agroprocessing capacity has been identified as one of the transformative opportunities to diversify away from exporting primary commodities, move up the value chain, attract investment, and drive economic growth in SSA.<sup>564</sup> Meanwhile, high population growth, rising disposable income, rapid urbanization, expansion of supermarket chains, and technological growth are predicted to contribute to high growth in local demand for processed agrifood and beverage products.<sup>565</sup> Therefore, the agrifood processing value chain presents big growth potential as well as opportunities for U.S. firms.

<sup>560</sup> Botes, Lane, and Edinger, "The New Frontier: Winning in the African Oil and Gas Industry," March 15, 2019.

<sup>561</sup> Addison, "Subsea Tieback Potential Grows," August 12, 2016.

<sup>562</sup> This structural reduction in costs included nondigital cost cutting strategies, such as earlier engagement with contractors and changes to project design (e.g., using smaller platforms). Ramsay, "Deepwater Struggles to Make Its Case," May 21, 2019.

<sup>563</sup> UNCTAD, *Commodities at a Glance: Special Issue on Coffee*, 2018.

<sup>564</sup> World Economic Forum, "Grow Africa: Partnering to Achieve," January 2016.

<sup>565</sup> Fairtrade Messe, "Nigeria Food + Bev Tec" (accessed 10/14/2019); USITC, *AGOA: Trade and Investment Performance Overview*, 2014.

There are primarily two types of agrifood processing value chains in SSA. One is export-oriented, such as the coffee value chain, which primarily operates to meet foreign final demand. The other is domestic-market oriented, such as the beverage value chain, which primarily operates to meet local final demand. However, with the economic advancement and the rising income levels in SSA, some export-oriented industries could shift to meet the growing domestic demand.

Although U.S. firms participate in these two types of SSA agrifood value chains differently, as in the cases of beverage and coffee value chains discussed below, they face six common challenges: (1) lack of high-yielding and pest-resistant varieties, (2) low quality of produce, (3) lack of inputs, (4) lack of environmental sustainability or climate change considerations, (5) inability of smallholder producers to meet production and quality requirements of large buyers, and (6) poor vertical linkages between producers (formal and informal) and retailers.<sup>566</sup> Despite this, there is significant growth potential for agrifood value chains in SSA, especially in agrifood value chains oriented toward the domestic market.

## U.S. Firms' Current Integration

### Beverage Value Chain

The beverage industry can be broken down into alcoholic and nonalcoholic segments. Alcoholic beverages include wine, beer, and spirits, while nonalcoholic beverages include energy drinks, teas, sports drinks, water, juices, and soft drinks.<sup>567</sup> For the purpose of this case study, beer and nonalcoholic beverages are the primary focuses of the beverage value chain in SSA, as both of them are domestic-market oriented.

#### Beer

The SSA beer market is one of the fastest growing in the world, projected to grow at 5 percent annually until 2020, compared to 3 percent for Asia and 1 percent for Europe. In 2017, SSA's \$13 billion beer market accounted for 2.5 percent by value of the global beer market, estimated to be around \$530 billion.<sup>568</sup> South Africa and Nigeria are the two largest beer markets in SSA.<sup>569</sup> U.S. firms' current integration in the SSA beer value chain is mainly via two channels: one is through local beer production by multinational enterprises (MNEs), and the other is through supplying brewing inputs to the SSA craft beer market.

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<sup>566</sup> Bamber, et al., "Connecting Local Producers in Developing Countries," December 3, 2013; UNIDO, *Agribusiness for Africa's Prosperity*, 2011; GEF and UNDP, "Options and Opportunities to Make Food Value Chains," September 5, 2017.

<sup>567</sup> Beverage Association of South Africa (BEVSA website), <http://www.bevsa.co.za/beverages> (accessed October 16, 2019).

<sup>568</sup> Business Wire, "Analyzing the Global Beer Industry 2019," September 9, 2019; Fick, "Multinational Brewers Look to Tap," April 19, 2017; UNIAFRICA, *The Dynamism in the African Beer Market*, February 2018; Zion Market Research, "Global Industry Size and Share of Beer Market," August 29, 2019.

<sup>569</sup> UNIAFRICA, *The Dynamism in the African Beer Market*, February 2018.

## Multinational Enterprises' (MNEs') Local Beer Production

Beer production in the SSA market is highly concentrated. In 2017, four MNEs—Heineken, Castel, Diageo Plc, and AB InBev—accounted for around 90 percent of the market, by revenue.<sup>570</sup> In South Africa, the market is even more concentrated, with just two firms, South African Breweries (SAB)<sup>571</sup> and Heineken South Africa (Heineken SA), serving virtually the whole market. In 2018, SAB held an 87 percent share of the South African beer market, while Heineken SA held a share of 12 percent.<sup>572</sup> Although Heineken, Castel, Diageo Plc, and AB InBev have headquarters outside of the United States, they all have significant U.S. operations and U.S. subsidiaries. For instance, AB InBev is the result of a merger between InBev, a Belgian Brazilian firm, and Anheuser Busch (AB), an American brewing firm. In 2016, AB InBev merged with SABMiller. U.S. integration in the SSA beer market is primarily through AB InBev operations in SSA.

Most of the beers brewed by these MNEs in SSA are for the SSA market, typically within a specific region of SSA.<sup>573</sup> For example, AB InBev retails throughout SSA countries and operates breweries in seven SSA economies.<sup>574</sup> Heineken operates breweries in 11 SSA economies.<sup>575</sup> Diageo operates 13 breweries in SSA and licenses production of its products to third parties in 15 SSA countries.<sup>576</sup>

These MNEs have established strong vertical linkages with local grain farmers and created the entire supply chains (farm to retail) locally. In the upstream of the supply chain, grain and hop cultivation, brewers have to rely on a large number of small-scale local farmers to secure key brewing supplies (e.g., barley, hops, wheat, sorghum, etc.).<sup>577</sup> To improve yields and quality of these inputs, foreign MNEs have deployed agronomists to share seed technology with farmers.<sup>578</sup> For example, in an effort to overcome capacity constraint issues that affect the availability of barley, AB InBev operates direct agricultural support programs in four SSA economies (South Africa, Tanzania, Uganda, and Zambia) to help ensure a secure supply of barley, hops, and sorghum.<sup>579</sup> Diageo, having made similar investments in agricultural support programs over several decades, had grown to involve 72,000 farmers in 2018, and was able to source 82 percent of SSA input requirements locally.

In addition to working with local farmers to increase output and crop quality, MNEs have taken significant steps to integrate local farmers into their supply chains. Faced with high transaction costs of annually purchasing inputs from roughly 150,000 small-scale barley producers, Heineken has established 13 operating companies covering 27 national and regional value chains throughout SSA and will open

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<sup>570</sup> UNIAFRICA, *The Dynamism in the African Beer Market*, February 2018; Massoudi and Abboud, "How Deal for SABMiller," July 24, 2019.

<sup>571</sup> A subsidiary of SABMiller and AB InBev.

<sup>572</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>573</sup> UNCTAD, *The Economic Development in Africa Report 2019*, 2019.

<sup>574</sup> Botswana, Ghana, Nigeria, South Africa, Tanzania, Uganda, and Zambia.

<sup>575</sup> Burundi, the Democratic Republic of the Congo, Ethiopia, Côte d'Ivoire, Kenya, Réunion, Mozambique, Nigeria, Rwanda, Sierra Leone, and South Africa.

<sup>576</sup> AB InBev, *2018 Annual Report*, 2019; Diageo, *Annual Report 2019*, 2019; Heineken, *Annual Report 2018*, 2019.

<sup>577</sup> Pilling, "Diageo Brews Beer in Kenya," November 1, 2019; Watabaji et al., "Integrative Role of Value Chain Governance," November 2, 2016.

<sup>578</sup> Benton, "AB InBev: Brewing Up Economic Growth in Africa," December 15, 2017.

<sup>579</sup> AB InBev, *2018 Annual Report*, 2019.

new malting plants in Ethiopia and South Africa.<sup>580</sup> Through these operating companies, Heineken has implemented advanced financing and long-term contracting with its Ethiopian suppliers to ensure a dedicated, reliable barley supply.<sup>581</sup> Additionally, to facilitate better business practices, some companies, such as AB InBev, have introduced accelerator and entrepreneurship programs to help potential suppliers increase capacity and advance business know-how so that they can integrate into MNE supply chains.<sup>582</sup> Research indicates that through these strong vertical linkages, foreign MNEs can facilitate the modernization in food value chains in SSA.<sup>583</sup>

## Supplying Inputs to SSA Craft Beer Market

In 2018, craft beer accounted for about 2 percent of South Africa's beer market.<sup>584</sup> At that time, the South African craft beer market was valued at \$100 million and is forecast to grow by more than 3 percent per year through 2024. The United States has been an important source of high-quality inputs for South African craft brewers. The South African craft beer market absorbs nearly all U.S. exports to South Africa of malted barley, hops, and brewer's yeast, and the demand for U.S. exports of these products is expected to rise.<sup>585</sup>

South African growers almost exclusively supply large, low-cost, mainstream beer producers such as SAB and Heineken SA.<sup>586</sup> However, due to inconsistent quality and supply in local sourcing, South African craft beer brewers have turned to U.S. producers for premium quality inputs instead.<sup>587</sup> In 2018, the United States accounted for over half (58 percent) of South African imports of hops,<sup>588</sup> 26 percent of South African imports of brewer's yeast,<sup>589</sup> and just 2 percent of South African imports of malted barley.<sup>590</sup> U.S. exports of these products were valued at \$3.4 million in 2018. Almost all U.S. exports of these products went to South African craft beer breweries.<sup>591</sup> For these inputs, U.S. firms face low, or relatively low, import tariffs, or none at all; U.S. exports of malted barley and hops can enter SA duty free, but brewer's yeast is subject to a 15 percent duty.<sup>592</sup>

## Nonalcoholic Beverages

South Africa and Nigeria are the two largest importers of food and beverage products in Africa (over \$700 million in imports in 2018).<sup>593</sup> In Nigeria, food and beverage products account for 22 percent of

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<sup>580</sup> Heineken, *Annual Report 2018*, 2019.

<sup>581</sup> Watabaji, et al., "Integrative Role of Value Chain Governance," November 2, 2016.

<sup>582</sup> Benton, Dale, "AB InBev: Brewing Up Economic Growth in Africa," December 15, 2017.

<sup>583</sup> Tefera, JBijman, and Slingerland, "Multinationals and Modernisation of Domestic Value Chains in Africa," March 25, 2019, 1–17.

<sup>584</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>585</sup> Birguid, "South Africa Craft Beer Market Analysis," January 2019.

<sup>586</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>587</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>588</sup> HS codes 121010, 121020, and 130213.

<sup>589</sup> HS code 210220.

<sup>590</sup> HS codes 11071020 and 11072020.

<sup>591</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>592</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>593</sup> Fairtrade Messe, "Nigeria Food + Bev Tec" (accessed October 14, 2019).

manufacturing output. Within the nonalcoholic beverage segment, Coca-Cola entered the Nigerian market many years ago and thus provides an illustrative case study of a U.S. firm with established, local (i.e., SSA-based) supply chains.<sup>594</sup>

As in the beer brewing industry, Coca-Cola established vertically integrated supply chains in the regions where it retails its products. Most Coca-Cola operations in SSA are independent entities licensed by Coca-Cola's headquarters in the United States. However, the Coca-Cola headquarters also operate wholly owned syrup plants, including one in Eswatini (formerly Swaziland), to make the highly proprietary concentrate that goes into the beverages. Consequently, Coca-Cola operations under license in other SSA countries have to import the concentrate from Eswatini in order to produce locally.<sup>595</sup>

Coca-Cola in South Africa has been working to ensure that 50 percent of their ingredients are sourced locally.<sup>596</sup> As a general strategy, Coca-Cola tries to source its production and canning and bottling inputs near the area of retail.<sup>597</sup> In 2018, Coca-Cola sourced 98 percent, by value, of inputs within the country of operation worldwide.<sup>598</sup> This is a portion of Coca-Cola's sustainable sourcing strategy that seeks to reduce the costs and risks of supply chains that are internationally integrated.<sup>599</sup> In some cases, all inputs are sourced within the country of operation. For example, in 2018, the Coca-Cola operations in Nigeria sourced 100 percent of the metal (for cans), glass (for bottles), and polyethylene terephthalate (PET) resins (a thermoplastic polymer resin used for bottles and to package soft drinks) locally in Nigeria.<sup>600</sup> Local sourcing is actually more prevalent in emerging and developing markets than in established markets (both within SSA and worldwide), which indicates that the market is less integrated into regional value chains.<sup>601</sup>

## Coffee Value Chain

Primarily, the United States' involvement in the SSA coffee market is as a major importer of green coffee beans grown in SSA countries, which are then roasted and retailed in the United States. Additionally, U.S. firms, such as Starbucks and Smuckers, have made direct investments in SSA coffee farmers to ensure stable supplies of high-quality coffee beans. Additionally, in response to rising SSA demand for coffee, Starbucks has been opening retail locations in South Africa and elsewhere.

In the production year 2018–19, the United States was the world's second-largest importer by volume (after the EU) of coffee beans, almost entirely dried green coffee beans; it was also the world's second-largest consumer of coffee.<sup>602</sup> In production year 2018–19, SSA's top coffee producer countries by

<sup>594</sup> Fairtrade Messe, "Nigeria Food + Bev Tec" (accessed October 14, 2019).

<sup>595</sup> South African industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>596</sup> South African industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>597</sup> Coca-Cola Great Britain, "Sourcing Map" (accessed October 16, 2019).

<sup>598</sup> Coca-Cola Hellenic Bottling Company, "Responsible and Sustainable Source" (accessed October 19, 2019).

<sup>599</sup> Coca-Cola Company, "2018 Business and Sustainability Report," April 2019; Coca-Cola Company, "2018 Annual Report Form 10-K," February 21, 2019.

<sup>600</sup> Coca-Cola Hellenic Bottling Company, "Responsible and Sustainable Source" (accessed October 19, 2019).

<sup>601</sup> Coca-Cola Hellenic Bottling Company, "Responsible and Sustainable Source" (accessed October 19, 2019).

<sup>602</sup> USDA, FAS, *Coffee: World Markets and Trade*, 2019.

volume were Ethiopia, Uganda, Côte d'Ivoire, Tanzania, Kenya, and Cameroon.<sup>603</sup> Together they produced 16.2 million 60-kilogram bags of coffee beans, accounting for about 9.3 percent of global coffee production.<sup>604</sup> In calendar year 2018, SSA's share of the U.S. imports of unroasted coffee beans was 6.1 percent; and Ethiopia and Uganda were the top two SSA suppliers with a share of 2.9 percent and 0.9 percent, respectively.<sup>605</sup>

The data show that although many SSA countries are major producers of coffee beans, their participation in the coffee value chain is only at the cultivation and primary processing (i.e., washing and drying) stages.<sup>606</sup> Roasting typically occurs in the country where the coffee is retailed. This is because the quality of the coffee declines rapidly two weeks after the beans are roasted, and growers accordingly export green coffee beans, which have a longer shelf life.<sup>607</sup> Poor infrastructure, long shipping times, limited port facilities, insecure payment mechanisms, limited access to credit, difficulty connecting to buyers, and weak oversight of operations all favor shipping in unroasted form. Together, these challenges make it difficult for growers to move further down in the value chain.<sup>608</sup> Consequently, most of the value added in the coffee value chain is captured outside of the bean-producing countries.<sup>609</sup>

In production year 2018–19, less than 1 percent by value of coffee-related exports from Ethiopia and Uganda were roasted; the rest were green coffee beans.<sup>610</sup> By contrast, all coffee-related imports into these countries are roasted coffee beans and coffee extracts. In general, SSA countries export the majority of their coffee production. In Uganda, for example, virtually all local production was exported: in production year 2018–19, Ugandan producers exported 96 percent of the total production volume, and domestic consumption was equivalent to less than 5 percent of total coffee output, by volume.<sup>611</sup> By contrast, Ethiopia is both a major exporter and consumer of coffee. In the production year 2018–19, Ethiopia exported about 55 percent, by volume, of its coffee beans and consumed the rest domestically.<sup>612</sup> Ethiopia imports almost no roasted or processed coffee beans and instead satisfies domestic demand almost entirely with domestic production.<sup>613</sup> In large part, this is because the government requires special licenses for importing roasted coffee.<sup>614</sup>

In Ethiopia, local firms have established roasting facilities through domestic investment.<sup>615</sup> However, local roasters are not price competitive with foreign roasters; therefore, these firms only compete in the

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<sup>603</sup> USDA, FAS, *Coffee: World Markets and Trade*, 2019.

<sup>604</sup> USDA, FAS, *Coffee: World Markets and Trade*, 2019.

<sup>605</sup> USDA, FAS, Global Agricultural Trade System, BICO (HS-10) Product Code 0040AT (accessed October 15, 2019).

<sup>606</sup> FAO, *FAO Statistical Pocket Book Coffee 2015*, 2015; Porto, Olarreaga, and Chauvin, *Supply Chains in Export Agriculture*, 2011.

<sup>607</sup> USITC, *Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness*, 2009.

<sup>608</sup> Agri Logic. *Value Chain Analysis for the Coffee Sector in Rwanda*, July 27, 2018; Morjaria, Mason, and Martinez Garcia, "How the Coffee Industry Is Building," August 14, 2018.

<sup>609</sup> UNCTAD, *Commodities at a Glance: Special Issue on Coffee*, 2018.

<sup>610</sup> USDA, FAS, *Coffee: World Markets and Trade*, 2019.

<sup>611</sup> USDA, FAS, *Coffee: World Markets and Trade*, 2019.

<sup>612</sup> USDA, FAS, *Coffee: World Markets and Trade*, 2019.

<sup>613</sup> Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>614</sup> Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>615</sup> Ethiopian industry association representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

domestic market.<sup>616</sup> Poor infrastructure presents a significant challenge to Ethiopian firms attempting to move further downstream in the value chain (i.e., roasting, exporting, and direct retail).<sup>617</sup> An additional factor that contributes to Ethiopian firms' poor price competitiveness is that the domestic legal environment is not conducive to attracting FDI.<sup>618</sup> Therefore, local roasters must rely primarily on domestic investment to establish a new coffee bean roaster, though some exceptions exist.<sup>619</sup> Moreover, domestic roasters lack the overseas connections to sell to specialty coffee buyers, the portion of the market where Ethiopian exporters would be the most competitive on price and quality.<sup>620</sup> Consequently, Ethiopian coffee growers primarily export their coffee through a government-run coffee exchange or to a large multinational roaster-retailer, such as Starbucks.<sup>621</sup>

The roasting and retail segment of the coffee market is relatively concentrated in the top six firms, accounting for approximately 35 percent of the global roasting volume in 2016–17.<sup>622</sup> Together the two top U.S. firms, J.M. Smuckers and Starbucks, accounted for 7 percent of this segment.<sup>623</sup> In their most recent annual reports, both firms noted that coffee bean price fluctuations and the reliability and scalability of coffee cultivation supply chains are significant risk factors to growth.<sup>624</sup>

Given these risk factors and the fact that principal demand for coffee is primarily outside of SSA, U.S. firms have thus far primarily engaged the SSA coffee value chain at the cultivation and washing stages. For example, to address concerns about reliable and sustainable coffee bean supply, many firms, including Starbucks, have invested in environmentally sustainable coffee production certification schemes, such as Fair Trade Coffee, the Global Coffee Platform, and the Sustainable Coffee Challenge.<sup>625</sup> U.S. retailers, as again including Starbucks, have established long-term relationships with SSA suppliers to ensure a stable supply of washed, green coffee beans of the requisite quality. They connect growers with agronomists to facilitate higher crop yields and connect growers to reliable payment networks.<sup>626</sup> Moreover, Starbucks has invested in farmer support centers that as of this year will have provided direct training to 220,000 farmers that sell directly to Starbucks.<sup>627</sup>

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<sup>616</sup> Ethiopian industry association representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>617</sup> Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>618</sup> Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>619</sup> Ethiopian industry association representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019; Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>620</sup> Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019; and Ethiopian industry association representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>621</sup> Ethiopian industry association representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>622</sup> UNCTAD, *Commodities at a Glance: Special Issue on Coffee*, 2018.

<sup>623</sup> UNCTAD, *Commodities at a Glance: Special Issue on Coffee*, 2018.

<sup>624</sup> Smuckers, *Fiscal Year 2019 Annual Report*, 2019; Starbucks, *Fiscal 2018 Annual Report*, 2019.

<sup>625</sup> Panhuysen and Pierrot, *Coffee Barometer 2018*, 2018.

<sup>626</sup> Starbucks, "Story Map Journal," 2014.

<sup>627</sup> Panhuysen, and Pierrot, *Coffee Barometer 2018*, 2018.

## Opportunities and Challenges

### Beverage Value Chain

Given the expected high rate of growth in demand for beer in SSA and the geographically segmented nature of the SSA beer market, future opportunities for firms with significant U.S. involvement, principally SAB Miller AB InBev, will continue to arise throughout the value chain. Firms will likely continue advancing their input supply chains to increase yields and reduce costs. Firms will need to make increased investments in water purification, malting facilities, and breweries. In addition, U.S. producers of malted barley, hops, and brewer's yeast will likely see further opportunities to export to the South African craft beer market, given the estimated 3 percent annual growth rate of demand through 2024.<sup>628</sup>

Although the nonalcoholic beverage industry is likely to experience long-term growth, some policy changes aimed at addressing the health effects of high-sugar beverages may present challenges to some beverage producers. Specifically, special excise taxes on high-sugar beverages may make current offerings less price competitive relative to other beverages, and may require development of new, low-sugar offerings. For example, one challenge that beverages firms face in South Africa is the introduction of a sugar tax in April 2018. Regardless of a product's country of origin, the Ministry of Finance currently imposes a levy of 2.21 cents per gram of sugar on beverages with more than 4 grams per 100 ml, with the exception for 100 percent fruit juice beverages. Since the tax was introduced, firms have adjusted product offerings to include more low-sugar beverages or beverages with sugar alternatives.<sup>629</sup> Coca-Cola has reduced the sugar in its drinks by 26 percent since the tax was introduced.<sup>630</sup>

Another example of country risk from policy uncertainty is in Nigeria. The Nigerian government recently imposed a tax on Coca-Cola Nigeria's imports of Coca-Cola concentrate that was also applied retroactively on imports back to 2015 without prior communication with firms, which led to Coca-Cola facing a larger-than-anticipated tax bill. In addition to policy uncertainty, Coca-Cola Nigeria faces the challenge of weak transportation infrastructure that has led to its beverages going out of stock.<sup>631</sup>

### Coffee Value Chain

Aside from continued investment in the SSA coffee bean cultivation sector to improve yields and bean quality, there is an emerging trend of local roasting and retailing of high-quality coffee in SSA that could be an area of opportunity for U.S. firms. Between 2012 and 2016, growth in Africa's coffee consumption by volume slightly outpaced growth in the EU, the world's largest market. In Ethiopia and Uganda, average consumption growth over the period was 2.9 percent and 2.7 percent, respectively, almost

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<sup>628</sup> Birguid, "South Africa Craft Beer Market Analysis," January 2019.

<sup>629</sup> USDA, FAS, "South African Sugar Industry Crushed," March 13, 2019.

<sup>630</sup> Stroud, "Coca-Cola SA Reformulates," May 23, 2019.

<sup>631</sup> Industry representatives, interview by USITC staff, Lagos, Nigeria, September 3, 2019.

three times that of growth in Europe.<sup>632</sup> Average coffee consumption across Africa in the most recent production year, 2018–19, accelerated slightly to 3 percent year on year.<sup>633</sup>

There is some evidence that this rising demand will attract investment in roasting and retail operations in SSA. For instance, Starbucks has opened 13 retail locations in South Africa, up from just 2 stores in 2016.<sup>634</sup> Moreover, some local firms in Ethiopia have established roasting and retail operations in Ethiopia, and further investment in additional coffee roasters is planned.<sup>635</sup>

Given the high tariff and nontariff barriers in SSA, U.S. firms might find it difficult to develop regional, rather than country-specific, roasting and retail supply chains.<sup>636</sup> However, efforts under the auspices of the East African Community to harmonize customs procedures, reduce tariffs, and clarify rules of origin have increased regional integration and encouraged the free movement of capital, labor, and goods.<sup>637</sup>

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<sup>632</sup> ICO, *Value Addition in the African Coffee Sector*, September 2017.

<sup>633</sup> ICO, *Coffee Market Report: August 2019*, August 2019.

<sup>634</sup> Starbucks, *Store Counts: by Market*, 2019.

<sup>635</sup> Ethiopian industry association representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019; and Ethiopian industry representative, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>636</sup> ICO, *Value Addition in the African Coffee Sector*, September 2017.

<sup>637</sup> Daly, Abdulsamad, and Gereffi, "Regional Value Chains in East Africa," 2016; Siba, and Sow, "Strengthening Regional Value Chains," 2018; UNCTAD, *East African Community Regional Integration*, 2018.



# Chapter 5

## Intellectual Property Rights Environment and Enforcement

### Introduction

This chapter describes the intellectual property rights (IPRs) environment in SSA. It gives an overview of national and regional laws, enforcement measures, and infringement issues in key SSA markets. Case studies in the chapter illustrate the impact of IPRs on trade and investment. The first part of the chapter gives an overview of notable IPR-related developments and laws in the key markets, as well as regional IPR integration efforts and organizations. The second part of the chapter is made up of three case studies, selected to cover each of the three pillars of intellectual property (IP)—patents, copyrights, and trademarks—and how they are protected in varying industry sectors in the key markets. Specifically, the case studies describe proposed amendments to the South African patent law and indicate how they may impact trade and investment in pharmaceuticals for the healthcare market in that country; how problems with copyright protection affect creative content owners’ ability to capitalize on their content, particularly in the Nigerian film industry; and how Ethiopia’s efforts to improve its trademark enforcement capacity may strengthen the country’s ability to attract trade and investment.

### Key Findings

Each of the key markets chosen for examination in this report—Côte d’Ivoire, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, and South Africa—has its own statutory framework for protection of IPRs, though four of these countries are members of subregional intellectual property organizations that aim to streamline some aspects of the IP registration and enforcement processes.<sup>638</sup> Unlike the situation in the United States, statutory protection of IP and public acceptance of such protections are relatively new to countries in SSA.<sup>639</sup> However, all seven SSA key markets, except Ethiopia, are parties to the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement),<sup>640</sup> which requires WTO members to have laws and other measures in place to protect IPRs.<sup>641</sup> As U.S. and other foreign companies seek to enter emerging markets, they often find that, even when IP laws are in place, they face difficulties protecting and enforcing their IPRs. Difficulties may range from a lack of transparency in the application process to weak enforcement of IPRs. Competing governmental priorities, complex market realities, and lack of capacity for implementation and

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<sup>638</sup> Ethiopia, Nigeria, and South Africa do not belong to either subregional intellectual property organization.

<sup>639</sup> For instance, Ethiopia enacted its first IP law in 2004. As a former British colony, Kenya has had IPR protections in its laws since 1913, but it was not until 1989—26 years after Kenya’s independence—that Kenyans were able to register their patents through their own system rather than applying first in the UK.

<sup>640</sup> Agreement on Trade-Related Aspects of Intellectual Property Rights, April 15, 1994.

<sup>641</sup> Though the TRIPS Agreement does set minimum standards, it grants signatories varying degrees of flexibility for implementing the minimum standards for each area of intellectual property.

enforcement present significant challenges as SSA countries seek to strengthen the legal and regulatory framework for IPRs.<sup>642</sup> Table 5.1 lists the key findings for the IPR environment in SSA.

**Table 5.1** Key findings of case studies on the intellectual property rights (IPR) environment in SSA

Type of IPR	Country of focus	IPR policy issues	Impact on trade and investment
Patent	South Africa	Proposed changes to the law will move the pharmaceutical patent filing system from a depository process to a substantive review process. Other developments include the introduction of patent opposition prior to and following granting of patents, and expanding the use of parallel importation.	Increased scrutiny of applications may encourage investment by weeding out non-genuine goods in the market. However, investors also anticipate lengthy processing delays and possible higher costs for firms filing patents which could reduce investment. Elements of this proposal could also increase access to generic medications for consumers.
Copyright	Nigeria	There is widespread copyright infringement of films in Nigeria due to lack of enforcement capacity, which has led to a highly informal film distribution market. Increased penalties for infringement have recently been introduced.	Copyright infringement and the film market structure discourage international investment and slow domestic growth, though foreign firms are purchasing distribution rights to some Nigerian films for digital streaming.
Trademark	Ethiopia	Infringement of international trademarks is pervasive in Ethiopia, due to lack of awareness and low enforcement capacity. Ethiopia is not a member of the World Trade organization (WTO) or key IPR agreements such as the Agreement on Trade-Related Aspects of Intellectual Property (TRIPS), but after recent reforms, its IPR laws are generally in line with global standards. <sup>a</sup>	Recent IPR reforms have created a more predictable business environment. However, there is not yet a direct link between trademark reform and increases in FDI and trade flows.

Source: Compiled by USITC staff.

<sup>a</sup> Abdo, "Legislative Protection of Property Rights in Ethiopia," December 2013, 196.

## IPR Overview

In general, IP is often at the center of debate about the most effective way to promote innovation to drive development. Industry representatives from the U.S. Chamber of Commerce emphasize the role of

<sup>642</sup> Global Intellectual Property Strategy Center, written submission to the USITC, July 1, 2019. Citing an audit of the Kenyan Anti-Counterfeit Authority (ACA), the organization notes that the ACA has only 30 percent of the capacity needed for enforcement. USITC, hearing transcript, July 24, 2019, 239–40 (testimony of Getachew Alemu).

IP in attracting business and investment,<sup>643</sup> while some academic sources suggest that the TRIPS framework does not guarantee increases in FDI for the world's least-developed countries.<sup>644</sup>

Data on IPR applications filed (filings) in the key SSA markets show that filings in the key markets are low. Table 5.2 below combines filings by resident IPR owners and those abroad.<sup>645</sup>

**Table 5.2** 2018 Intellectual property filings, resident and abroad

Statistic	Ethiopia	Ghana	Nigeria	Côte d'Ivoire	Kenya	Rwanda	South Africa	Total
Patents filed	13	15	153	394	293	6	1,861	2,735
Trademarks filed	917	1,008	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )	381	34,028	36,334

Source: World Intellectual Property Organization (WIPO), "Statistical Country Profiles" (accessed October 18, 2019).

<sup>a</sup> Data are unavailable.

<sup>b</sup> Data for 2018 are unavailable. However, in 2017 there were 6,102 trademarks filed in Kenya.

There are a number of indices that evaluate the overall IP environment including those related to implementation and enforcement, such as the rule of law, judicial independence, control of corruption, and political stability. A comparison of International Property Rights Index (IPRI) rankings in table 5.3 (on a scale of 1 to 10, where higher scores reflect better rankings) shows that legal and political factors can play an important role in the IP environment.

<sup>643</sup> U.S. Chamber of Commerce, written submission to the USITC, August 14, 2019, 2–3. In discussing its International IP Index, the U.S. Chamber noted that "economies with fair to strong IP environments are only about 40 percent more open for business and attractive to foreign investments in their production systems compared with weaker economies. Companies in economies that provide robust IP environments are 33% more likely to see private-sector investment in R&D activities. Economies with robust IP regimes experience 76% more knowledge-based, technological, and creative outputs than economies whose IP regimes trail behind." The index also provides specific country analysis for Kenya, Nigeria, and South Africa. For more information, see New Market Labs, written submission to the USITC, August 19, 2019, 9.

<sup>644</sup> See, e.g., Ncube et al., "A Principled Approach to Intellectual Property Rights," 2019, 178.

<sup>645</sup> WIPO, "Statistical Country Profiles" (accessed October 18, 2019).

**Table 5.3** International Property Rights Index (IPRI) rankings, by country, 2019

Statistic	Côte d'Ivoire						South Africa
	Ethiopia	Ghana	Kenya	Nigeria	Rwanda		
IPRI (overall)	4.785	4.392	5.748	5.147	3.787	6.265	6.071
Legal and political environment	3.383	3.695	5.314	4.063	2.884	5.916	5.148
Judicial independence	2.418	4.472	5.867	5.555	3.539	6.647	5.700
Rule of law	3.737	4.092	5.260	4.174	3.268	5.257	4.977
Control of corruption	3.956	3.885	4.549	3.088	2.864	6.266	4.983
Political stability	3.419	2.332	5.580	3.436	1.863	5.493	4.932
Protection of physical property rights	6.888	5.912	5.898	6.486	4.707	7.078	6.348
Protection of IPR	4.084	3.569	6.032	4.891	3.772	5.801	6.717
Perception of IPR protection	4.369	4.638	5.364	5.641	3.534	6.236	5.601
Patent protection	5.783	2.500	6.700	6.433	5.783	5.366	7.750
Copyright piracy	2.100	( <sup>a</sup> )	( <sup>a</sup> )	2.600	2.000	( <sup>a</sup> )	6.800

Source: Property Rights Alliance, "2019 International Property Rights Index: Countries" (accessed October 28, 2019); Levy-Carciente and Montanari, "International Property Rights Index 2019," 2019.

Notes: Rankings fall between 0 (low) and 10 (high). For context, the Organisation for Economic Co-operation and Development (OECD) average is 7.269 for the overall international property rights index, 7.021 for legal and political environment, 7.379 for protection of physical property rights, and 7.408 for protection of intellectual property rights. SSA scored 4.780 for the overall international property rights index, 3.974 for legal and political environment, 5.722 for protection of physical property rights, and 4.645 for protection of intellectual property rights.

<sup>a</sup>Data are unavailable.

## Patents

The World Intellectual Property Organization (WIPO) defines a patent as "an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. To get a patent, technical information about the invention must be disclosed to the public in a patent application."<sup>646</sup>

Industry representatives have indicated that the IP framework for patents is not a major consideration for companies interested in investing in SSA countries, in large part because there is a low risk for reverse-engineering or replication of technology in SSA.<sup>647</sup> One indication of this is that the vast majority of patent applications in the key markets discussed in this report are submitted by filers "abroad," according to WIPO filing statistics,<sup>648</sup> which suggests less advanced research and development efforts

<sup>646</sup> WIPO, "Patents: What Is a Patent?" (accessed January 21, 2020).

<sup>647</sup> Industry representatives, interview by USITC staff, Addis Ababa, Ethiopia, October 1, 2019; industry representatives, interview by USITC staff, Nairobi, Kenya, October 3, 2019.

<sup>648</sup> WIPO, "Statistical Country Profiles" (accessed January 21, 2020).

and manufacturing capabilities in SSA compared to other regions like Asia.<sup>649</sup> However, there is a wide variation in utilization of the patent system in the key markets. For instance, Ethiopia has granted fewer than 300 patents total.<sup>650</sup> South Africa, by contrast, has 73,270 patents in force.<sup>651</sup> See table 5.2 above for the 2018 WIPO filing statistics for each of the key markets.

Public health concerns were cited in support of both the need for strong IPR enforcement and the complexity of balancing IP protections with affordable access to lifesaving medicine. Counterfeit products in particular allegedly have resulted in tens of thousands of deaths each year in SSA.<sup>652</sup> According to the World Health Organization (WHO), 42 percent of the incident reports of “substandard or falsified” medical products to the Global Surveillance and Monitoring System between 2013 and 2017 were from the SSA region.<sup>653</sup>

In recognition of the importance of access to safe, affordable medicine, the TRIPS Agreement carves out exemptions to certain IPR obligations for least-developed countries (LDCs). WTO members that qualify as LDCs, including 33 SSA markets, are exempt from TRIPS obligations related to patents or other IPRs on pharmaceutical products and clinical data until 2033.<sup>654</sup> Under this provision, LDCs may choose whether or not to protect pharmaceutical patents, allowing flexibility to buy or produce versions of generic medicines that would otherwise be more expensive because the patent owner would have the exclusive right to produce the medicine.

Parallel importation<sup>655</sup> and compulsory licensing<sup>656</sup> are other strategies implemented by developing countries to increase access to patented medicines. Both mechanisms can undermine firms’ ability to capitalize on their patented medicines. On the other hand, one public-interest group stated that IPRs play a “significant role” in restricting access to medicine, and that countries are not encouraged to use options available to reduce prices and increase access to generic medicines.<sup>657</sup>

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<sup>649</sup> One report notes that manufacturing value added in Africa lags that of East Asia. For more on the role of manufacturing in value chains in SSA, see chapter 4. Signé and Johnson, *The Potential of Manufacturing and Industrialization in Africa*, September 2018.

<sup>650</sup> Industry representatives, interview by USITC staff, Addis Ababa, Ethiopia, October 2, 2019.

<sup>651</sup> WIPO, “Statistical Country Profiles” (accessed January 21, 2020).

<sup>652</sup> Christensen, “Tens of Thousands Die in Africa Each Year,” November 15, 2018.

<sup>653</sup> WHO, “WHO Global Surveillance and Monitoring System for Substandard and Falsified Medical Products,” 2017, 11; Christensen, “Tens of Thousands Die in Africa Each Year,” November 15, 2018.

<sup>654</sup> WTO, “WTO Members Agree to Extend Drug Patent Exemption for Poorest Members,” 2015, 1–2. Rwanda and Ethiopia, designated as key markets in this report, are both classified as LDCs. However, Ethiopia is not a member of the WTO.

<sup>655</sup> “Parallel imports (PI), also called gray-market imports, are goods produced genuinely under protection of a trademark, patent, or copyright, placed into circulation in one market, and then imported into a second market without the authorization of the local owner of the intellectual property right.” Maskus, *Parallel Imports in Pharmaceuticals*, April 2001.

<sup>656</sup> “Compulsory licensing is when a government allows someone else to produce a patented product or process without the consent of the patent owner or plans to use the patent-protected invention itself. It is one of the flexibilities in the field of patent protection included in the WTO’s agreement on intellectual property—the TRIPS (Trade-Related Aspects of Intellectual Property Rights) Agreement.” WTO, “Compulsory Licensing of Pharmaceuticals and TRIPS” (accessed January 21, 2020).

<sup>657</sup> USITC, hearing transcript, July 24, 2019 (testimony of Zain Rizvi, Public Citizen), 170.

Provisions permitting parallel importation in South Africa’s proposed amendments are the subject of controversy (see the case study 5.1 in this chapter, on the pharmaceutical industry in South Africa, for more details).

In addition, there is some concern about patent law clauses in certain key markets that give government agencies discretion to require disclosure of patent license terms in order to review whether they deem the terms to be restrictive or against the national economic interest.<sup>658</sup> Industry representatives have expressed concern that such a provision in Kenyan patent law is susceptible to abuse by government agencies and that it could result in companies being forced to lower license fees. In turn, the lowering of fees could cause significant losses for these companies.<sup>659</sup> However, Kenyan Industrial Property Institute (KIPI) officials say that they rarely review patent licenses, in part because companies rarely provide them and in part because the agency does not have the resources to undertake meaningful review even if the licenses are provided.<sup>660</sup>

## Copyright

WIPO defines the term copyright as “a legal term used to describe the rights that creators have over their literary and artistic works. Works covered by copyright range from books, music, paintings, sculpture, and films to computer programs, databases, advertisements, maps, and technical drawings.”<sup>661</sup> Copyright infringement, often referred to as “piracy,” is a widespread issue for rights holders operating in SSA markets. Due to low internet penetration,<sup>662</sup> counterfeit CDs, DVDs, and books remain the predominant format of media distribution and also the primary method of copyright infringement. In addition, most SSA countries do not provide rules for IPRs that contemplate the digital age. Nigeria remains the only SSA key market that has acceded to the WIPO Copyright Treaty and WIPO Performances and Phonogram Treaty, collectively known as the WIPO Internet Treaties. These provide protections for IPR owners whose works are distributed through technologies that were not in existence or commonplace (e.g. the internet) when previous copyright treaties were established.<sup>663</sup> South Africa’s proposed amendments and Kenya’s 2019 amendments to their respective copyright laws both incorporate aspects of digital protection.<sup>664</sup>

In addition to piracy, poor administration of copyright regimes is a common issue in the key markets. In particular, recent amendments to Nigerian and Kenyan copyright laws include new provisions related to collective management organizations (CMOs or collecting societies) in order to address concerns that

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<sup>658</sup> U.S. Chamber of Commerce, “International IP Index—Kenya” (accessed January 21, 2020), 3; industry representatives, interview by USITC staff, Nairobi, Kenya October 3, 2019. The Chamber of Commerce report notes that “The KIPI has much leeway and can deny registration if it considers the contract harmful to the economic interest of Kenya, including, for instance, through ‘disproportionate’ royalties (Article 70).”

<sup>659</sup> Industry representatives, interview by USITC staff, Nairobi, Kenya, October 3, 2019.

<sup>660</sup> Government representative, interview by USITC staff, Nairobi, Kenya, October 4, 2019.

<sup>661</sup> WIPO, “Copyright: What Is Copyright?” (accessed January 21, 2020).

<sup>662</sup> For more details on internet connectivity in SSA, see appendix H.

<sup>663</sup> For more information on the Internet Treaties, see

[https://www.wipo.int/copyright/en/activities/internet\\_treaties.html](https://www.wipo.int/copyright/en/activities/internet_treaties.html).

<sup>664</sup> Republic of South Africa Copyright Amendment Bill (passed by Parliament, but not signed by President); Kenya Copyright Amendment Act 2019 (signed into law September 2019).

rights holders are not being paid their fair share of royalties. Many copyright frameworks rely on CMOs to facilitate delivery of royalties to rights holders. CMOs are common worldwide and are designed to assist in “identifying each and every owner of a protected work, each and every user thereof, [and in] identifying the owner(s) of the various layers of associated rights by potential users.”<sup>665</sup> However, some observers allege that CMOs are often mismanaged or corrupt.<sup>666</sup> Some observers claim that this perception erodes copyright enforcement initiatives because some artists do not pursue enforcement of their IPRs in an effort to keep profits from going to CMOs.<sup>667</sup>

In Kenya, the 2019 amendments to the Copyright Act<sup>668</sup> sought to address heated debates about corruption and mismanagement in CMOs. The amended copyright act gave broad management authority to the Kenya Copyright Board (KECOBO), including the right to dictate when CMOs must distribute funds. However, some industry representatives have indicated that CMOs have difficulty collecting license fees from broadcasters and establishments, such as restaurants, that owe fees for public performances. According to the representatives, enforcement and litigation costs related to attempts to collect from these entities can lead to delays in distributing funds to artists.<sup>669</sup>

## Trademarks

WIPO defines a trademark as “a sign capable of distinguishing the goods or services of one enterprise from those of other enterprises.”<sup>670</sup> Trademarks are crosscutting IPRs affecting multiple industries, from pharmaceuticals to textiles.

Counterfeit goods are prevalent in all SSA countries and cover a broad array of products.<sup>671</sup> They include counterfeit alcohol, cosmetics, feminine hygiene products, medicine, automobile parts, toner, and electrical appliances, among other goods.<sup>672</sup> Illicit trade in these products results in significant losses of revenue for IPR holders, though true estimates of losses are difficult to calculate.

In addition to problems combating counterfeit goods, multinational firms may also encounter situations in which their mark is not recognized as “well-known” in emerging markets, a requirement for obtaining trademark protection there. Uncertainty about requirements for established brands to protect their

<sup>665</sup> Onyido, “Copyright Collective Rights Management in Nigeria,” 2017.

<sup>666</sup> Band, “Cautionary Takes about Collective Rights Organizations, Part 2,” May 22, 2018; academic representative, interview by USITC staff, Nairobi, Kenya, October 7, 2019.

<sup>667</sup> Ilado, “Kenyan CMOs under Fire over Royalty Payments,” August 16, 2019. In one tweet, Kenyan rapper Khaligraph Jones stated, “MCSK don't you ever dare send me peanuts again. I have given authorisation for my music to be pirated. Don't collect money on my behalf anymore and do not arrest anyone playing my music on the streets.”

<sup>668</sup> The Copyright (Amendment) Act 2019.

<sup>669</sup> Industry representative, Interview by USITC staff, Nairobi, Kenya, October 3, 2019.

<sup>670</sup> WIPO, “Trademarks: What Is a trademark?” (accessed January 21, 2020).

<sup>671</sup> Interpol, “Fake Goods: Arrests and Seizures in Worldwide Operations,” July 12, 2018. The prevalence varies widely across countries. One meta-analysis found that prevalences of substandard medicine in samples from SSA countries ranged from 13 percent to 25 percent. However, no SSA countries are mentioned as being on the watchlist or priority watchlist in USTR’s Special 301 report from 2019. Ozawa et al., “Prevalence and Estimated Economic Burden,” August 10, 2018, 5; USTR, *2019 Special 301 Report*, April 2019.

<sup>672</sup> Global Intellectual Property Strategy Center, written submission to the USITC, July 1, 2020, 4.

marks can result in those marks being vulnerable to marks that copy, imitate, or otherwise benefit from the established brand's goodwill. The InterContinental Hotel's difficulty in Ethiopia, described in case study 5.3, illustrates challenges for multinational firms that seek to enter new markets.

However, even in countries obligated under Article 16.3 of the TRIPS Agreement to recognize well-known marks, there can be uncertainty for multinational firms. This is due in part to the fact that there is not an internationally accepted definition for well-known marks, though WIPO issued guidance on how to determine what qualifies for protection.<sup>673</sup> WIPO flags that some countries consider only a few factors in deciding whether to deny a mark on the grounds that it infringes on a well-known mark.<sup>674</sup> For example, they may consider whether a good is identical or similar to the goods that earned the well-known mark its reputation; whether the use of the other mark would make consumers believe there is a link between the two marks; and whether the well-known mark's owner's interest would be damaged by the use.<sup>675</sup>

The Japanese technology corporation, Sony Corporation, is appealing the ruling of Kenya's High Court regarding its trademarks in a case that centered on whether it was proper to grant competing marks to Sony Holding Limited, a Kenyan sugar company. The High Court denied Sony Corporation's opposition to Sony Holding Limited's marks, except for those in product classes in which Sony Corporation already held marks.<sup>676</sup> The court found that Sony Corporation did not provide sufficient evidence that Sony is a well-known brand in Kenya.<sup>677</sup> In interviews with Commission staff in October 2019, Kenyan government representatives maintained that the Sony mark was already well-established in Kenya outside of the Sony Corporation's electronics sector, including Sony Sugar and Sony Driving School.<sup>678</sup>

## Subregional Intellectual Property Organizations

There are two primary African subregional intellectual property organizations that provide some continuity for IPR holders across participating jurisdictions:<sup>679</sup> the Organisation Africaine de la Propriété Intellectuelle [African Intellectual Property Organization] (OAPI) and the African Regional Intellectual Property Organization (ARIPO). OAPI has 17 members,<sup>680</sup> including Côte d'Ivoire (one of the key markets discussed in this report). OAPI registrations of intellectual property automatically extend to all member states. In addition, decisions issued by a national court of any member state on the provisions of the

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<sup>673</sup> WIPO, "Joint Recommendation Concerning Provisions on the Protection," 2000.

<sup>674</sup> WIPO, "Well-known Marks" (accessed January 21, 2020).

<sup>675</sup> WIPO, "Well-known Marks" (accessed January 21, 2020).

<sup>676</sup> Sony Corporation v. Sony Holding Limited [ 2018 ] eKLR, 2018. See also U.S. Chamber of Commerce, "Inspiring Tomorrow: U.S. Chamber International IP Index. 7th ed.," 2019. Government representative, interview by USITC staff in Nairobi, Kenya, October 4, 2019.

<sup>677</sup> Fayo, "Court Rules SONY Is Not a Well-Known Brand in Kenya," May 31, 2018.

<sup>678</sup> Government representative, interview by USITC staff in Nairobi, Kenya, October 4, 2019.

<sup>679</sup> The African Union also administers the Pan-African Intellectual Property Organization (PAIPO). However, as of January 2020, only six countries have signed the PAIPO statute. For more information, see <https://au.int/en/node/32549>.

<sup>680</sup> The current member states of OAPI are Benin, Burkina Faso, Cameroon, the Central African Republic, Chad, Comoros, the Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, and Togo.

OAPI law are binding on all other member states. ARIPO has 19 members,<sup>681</sup> including Ghana, Kenya, and Rwanda (also key markets).

Unlike OAPI, ARIPO members do not grant automatic protection to IPRs registered in other member states. However, applicants from any ARIPO country can file for patent, industrial design, and utility model protection through a single application if that country has signed onto the Harare Protocol on Patents and Industrial Designs. The Harare Protocol allows applicants to file with any one of the members states or with the ARIPO office.<sup>682</sup> A similar system for trademark protection is covered under the Banjul Protocol.<sup>683</sup> Under that protocol, each designated country reviews the application to ensure its compliance with that country's individual laws.

Patent applications filed under ARIPO and OAPI increased in 2017, after having declined during the two previous years.<sup>684</sup> While ARIPO and OAPI can facilitate registration of IPRs, especially for foreign filers, some advocates claim that they do so at the expense of member states that are developing countries. For instance, one written submission filed with the Commission for this report asserted that both the OAPI and ARIPO systems are inconsistent with the desire of some member states to benefit from provisions for developing countries, such as the WTO exemptions for patent protection related to pharmaceuticals.<sup>685</sup>

## African Union and the African Continental Free Trade Area

African Union (AU) member states have announced that they plan to negotiate the protocols on IPR as part of Phase II of the African Continental Free Trade Area (AfCFTA). An in-depth discussion of AfCFTA regional integration efforts is included in chapter 8 of this report. In addition to patents, copyrights, and trademarks, plant breeders' rights<sup>686</sup> and traditional knowledge<sup>687</sup> will also be included in the AfCFTA Phase II negotiations.<sup>688</sup> Discussions of plant breeders' rights in particular highlight the challenges the AU will face in squaring current international standards with provisions sought by member states.

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<sup>681</sup> The current member states of ARIPO are Botswana, Eswatini, The Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mozambique, Namibia, Rwanda, São Tomé and Príncipe, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, Zambia, and Zimbabwe.

<sup>682</sup> ARIPO, "What Is a Patent?" (accessed January 21, 2020).

<sup>683</sup> ARIPO, "What Is a Trademark?" (accessed January 21, 2020).

<sup>684</sup> According to WIPO, "Applications filed at the African Regional Intellectual Property Organization (ARIPO) grew by 7.2% in 2017, while the African Intellectual Property Organization (OAPI) received 2.6% more applications in 2017 than in 2016." WIPO, *IP Facts and Figures 2018*, 2019.

<sup>685</sup> Public Citizen, written submission to the USITC, July 25, 2019, 8–9. Of the 19 ARIPO member states, 13 qualify as LDCs.

<sup>686</sup> Plant breeder rights confer IPRs as an incentive for the "the development of new varieties to contribute to sustainable progress in agriculture, horticulture and forestry." For more information, see [https://www.wipo.int/wipo\\_magazine/en/2006/04/article\\_0004.html](https://www.wipo.int/wipo_magazine/en/2006/04/article_0004.html).

<sup>687</sup> According to WIPO, "Traditional knowledge (TK) is knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity." WIPO "Traditional Knowledge" (accessed January 21, 2020).

<sup>688</sup> UNECA, ARIA IX, September 2019, xv.

Currently, the International Union for the Protection of New Varieties of Plants (UPOV) is the international standard for these IPRs. However, it is unclear whether the AU will incorporate the UPOV standards into the AfCFTA, as some raise concerns that UPOV does not adequately serve SSA needs.<sup>689</sup>

Whether AU member states will use a common baseline for AfCFTA —such as the TRIPS Agreement UPOV standards —is yet to be decided, but discussions concerning the negotiations indicate that many favor an IPR framework that advantages developing economies.<sup>690</sup> Under this approach, IP is used to drive innovation that addresses the needs of the poorest populations, such as facilitating industrial development and meeting basic needs like access to food, clean water, health care, and housing.<sup>691</sup>

## Case Study 5.1: Proposed Changes to Pharmaceutical Patent Policy in South Africa

### Summary

In May 2018, the South African Department of Trade and Industry released the *Intellectual Property (IP) Policy of the Republic of South Africa, Phase I* (Phase 1), the first of a three-part proposal to rewrite South Africa’s IP laws following a 2017 draft proposal release.<sup>692</sup> Phase 1 consists of proposed amendments to the regulatory process for the approval of pharmaceutical patents in South Africa that are intended to promote public health interests by enabling more rigorous review of pharmaceutical patents and facilitating parallel importation (described earlier in this chapter).

At the time of this writing, the proposal had not yet received legislative consent or been formally approved by the South African government. However, if implemented in its current form, this proposal will require substantial change to the regulatory approval process for pharmaceutical patents in South Africa. Phase 1 contains three major provisions that would likely affect the pharmaceutical market in South Africa: an alteration of South Africa’s patent filing system from a “depository” to “substantive review” process; the introduction of patent opposition both before and following the granting of a

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<sup>689</sup> Discussing ARIPO’s plant variety protection protocol, De Jonge, “Plant Variety Protection in Sub-Saharan Africa: Balancing Commercial and Smallholder Farmers’ Interest,” 2014, states: “Among their main concerns are 1) the fear that biopiracy will be facilitated, 2) the lack of protection of farmers’ rights, and 3) the non-appropriateness of the criteria for protection in the context of sub-Saharan Africa.”

<sup>690</sup> Government representative, interview by USITC staff in Addis Ababa, October 1, 2019; Ncube et al., “A Principled Approach to Intellectual Property Rights,” 2019, chapter 11.

<sup>691</sup> Hassan, Yaqub, and Diepeveen, “Intellectual Property and Developing Countries,” 2010, 8, 36; Syam and Muñoz Tellez, “Innovation and Global Intellectual Property Regulatory Regimes,” June 2016. Indeed, Kenyan President Uhuru Kenyatta’s “Big Four Agenda” focuses on much the same issues: enhancing manufacturing, food security and nutrition, universal health coverage, and affordable housing. To the extent that increased manufacturing capacity will attract investment from IP-intensive industries, IPRs are involved in this agenda, but it is unclear how much attention they will receive compared to the other agenda priorities.

<sup>692</sup> Government of South Africa, Department of Government Communication and Information System, “Statement of the Cabinet Meeting of 23 May 2018,” May 24, 2018; Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, June 2018.

patent; and the allowance of parallel importation<sup>693</sup> of patented drugs in the event of a public interest (such as public health).<sup>694</sup>

This case study begins with an overview of the pharmaceuticals market in South Africa and continues with a review of the current legal environment in South Africa for pharmaceutical patents, followed by a discussion of the South African market for pharmaceutical drugs. The study then looks specifically at the changes proposed by Phase 1 as highlighted above. This section summarizes industry and government views on the likely impact of the proposal on the pharmaceutical sector—and, specifically, on the trade and investment position of U.S. firms and U.S. investment in the South African pharmaceutical sector.

## The Market for Pharmaceuticals in South Africa

The South African healthcare sector is characterized by substantial public and private sector spending, and South Africa is the largest single-country pharmaceutical market by value in SSA.<sup>695</sup> Additionally, there is strong competition within the South African pharmaceutical market for both generic and nongeneric drugs. For the latter, companies headquartered in the United States, France, Switzerland, India, and South Africa, among others, participate in the nongeneric drug sector and frequently manufacture nongeneric drugs domestically for use in the South African market, as well as generic drugs.

### Healthcare Market in South Africa

Healthcare spending in South Africa is divided between private and public health plans. Most estimates show that approximately 80–85 percent of South Africans use a public health system, while the remaining 15–20 percent choose a private healthcare option.<sup>696</sup> According to World Bank estimates, between 8.0 and 8.8 percent of South Africa’s yearly GDP was spent on healthcare in 2016, a higher proportion than in Kenya (4.6 percent), Ghana (4.4 percent), and Nigeria (3.6 percent).<sup>697</sup>

The South African government is also working on a National Health Insurance (NHI) system, which would provide health coverage to South African citizens.<sup>698</sup> While still in its planning stages, the proposals have

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<sup>693</sup> In this instance, parallel importation would likely be in the form of the South African government’s Ministry of Health importing pharmaceutical drugs for South African residents’ use.

<sup>694</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, June 2018.

<sup>695</sup> According to one source, South Africa has “the largest and most well-developed pharmaceutical market in Africa due to a progressive business infrastructure and regulatory environment.” Kingdom of the Netherlands, “South African Healthcare Sector” (accessed September 9, 2019).

<sup>696</sup> This estimate indicated that of \$32.2 billion in healthcare spending in FY2017/FY2018, approximately \$17.1 billion occurred in the private sector and approximately \$15.0 billion in the public sector. Cision PR Newswire, “South Africa Healthcare Sector Report 2019,” May 14, 2019; RH Bophelo, “A Glimpse into the South African Healthcare Industry,” 2019; Government of the Netherlands, “South African Healthcare Sector” (accessed September 9, 2019).

<sup>697</sup> World Bank, “Current Health Expenditure (% of GDP)” (accessed September 9, 2019).

<sup>698</sup> Government of South Africa, Department of Health, “Understanding National Health Insurance” (accessed January 2, 2020).

drawn some concern from pharmaceutical and healthcare industry representatives that the system may undermine the private-sector health insurance market.<sup>699</sup>

## Pharmaceutical Market in South Africa

The pharmaceutical market in South Africa is the largest in SSA, with an estimated \$4.6 billion in 2018 retail sales.<sup>700</sup> About 66 percent of the medicines sold in the private sector are generic drugs, and 80 percent of public sector medicines are generic.<sup>701</sup> The market share for generic drugs in the South African market is expected to rise relative to branded products; one 2019 study estimated that a substantial share of the 9 percent growth last year in the South African pharmaceutical market can be traced to the rise in demand for generic medications.<sup>702</sup> It is also estimated that a majority of drugs (around 60 percent) used in South Africa are domestically produced, and that most of these are generic.<sup>703</sup>

South Africa (and SSA generally) faces a share of infectious disease transmissions (particularly malaria, TB, and HIV/AIDS<sup>704</sup>) that is well above the world average, which leads to a disproportionately high demand for infectious disease medications. However, economic development and changes in lifestyle have also helped to raise demand for treatments for noncommunicable diseases (along with higher demand for prescription drugs for chronic conditions).<sup>705</sup> Demand for pharmaceutical drugs focused on noncommunicable ailments (such as heart disease, cancer, diabetes, and blood pressure) has risen across SSA. One study estimates that from 2017 to 2030, the proportional contribution of such drugs to overall drug usage in Africa will rise by 21 percent.<sup>706</sup>

## U.S. Firms' Current Involvement in South African Pharmaceutical Market

The pharmaceutical market in South Africa is characterized by competition between large domestic and foreign-headquartered firms, as well as among a variety of typically smaller domestic pharmaceutical firms. The level of competition and major participants can vary depending on whether the product is generic or brand name.<sup>707</sup> U.S.-headquartered firms principally produce branded drugs (rather than

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<sup>699</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>700</sup> Cision PR Newswire, "South Africa Healthcare Sector Report 2019," May 14, 2019.

<sup>701</sup> Medical Academic, "Generic Market Keeps Growing," February 5, 2019.

<sup>702</sup> Additionally, one 2015 study estimated that between 2004 and 2011, growth in generic drugs had a compound annual growth rate of 22.3 percent in South Africa, well above the 13.4 percent growth for pharmaceutical products generally. McKinsey & Company, "Insights into Pharmaceuticals and Medical Products: Africa," April 2015; Business Report, "What 2019 Holds in Store for the Pharmaceutical Sector," January 2019.

<sup>703</sup> Government of the Netherlands, "South African Healthcare Sector" (accessed September 9, 2019).

<sup>704</sup> The United States government, under the State Department's President Emergency Plan for AIDS Relief (PEPFAR), pays for a portion of the drug purchases in SSA for HIV/AIDS, and the President's Malaria Initiative also supports the purchase of malaria medications.

<sup>705</sup> Lucchini, "African Pharmaceutical Market," November 30, 2018.

<sup>706</sup> Lucchini, "African Pharmaceutical Market," November 30, 2018.

<sup>707</sup> South African firms maintain a comparatively larger position in the generics and over-the-counter medications, while non-South African firms typically maintain a stronger profile in branded medications. MarketWatch, *South African Pharmaceutical Industry 2017–2019*, July 19, 2018

generic products) in South Africa.<sup>708</sup> The firms employ patents to protect their products for use in the South African market.<sup>709</sup> U.S. firms also tend to concentrate their market efforts on the private health care sector in South Africa.<sup>710</sup>

The South African pharmaceutical sector, as noted, is substantial in size. One 2017 study estimated that 88 companies were operating in this market, though 6 companies supplied more than half of the domestic market demand by revenue for pharmaceutical products. Three of these top six firms were headquartered abroad, including Pfizer (United States), SANOFI (France), and Novartis (Switzerland), while the other three—Aspen, Adcock Ingram, and Cipla Medpro—were all South African firms.<sup>711</sup> The Innovative Pharmaceutical Association of South Africa (IPASA), an industry association that represents firms making, selling, and importing pharmaceutical goods to the South African market, estimates that its membership makes up 43 percent of the private pharmaceutical sector of South Africa. Of its 26 members, 8 are U.S.-headquartered firms (Abbott, AbbVie, Amgen, Baxter, Eli Lilly, Merck, MSD, and Pfizer) and only one, Key Oncologics, is headquartered in South Africa.<sup>712</sup> Looking at the generics market specifically, members of the Generic and Biosimilar Medicines South Africa association are principally firms headquartered either in South Africa or India, with a few firms with global headquarters in either the United States or Europe.<sup>713</sup>

## Proposed Changes to South Africa’s Patent Regulatory Infrastructure

Should the Phase I proposal to South Africa’s intellectual property laws be adopted and implemented,<sup>714</sup> this would substantially change the regulatory infrastructure of the patent-granting system in South Africa for pharmaceutical companies. As noted, a key goal of the proposal is to balance IPRs with other public interest concerns (including public health, local manufacturing, and research and development).<sup>715</sup> Among the chief changes proposed in Phase I are moving the granting of patents from

<sup>708</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>709</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>710</sup> Both South African and U.S. firms are competitive across Africa: U.S. firms Merck, Johnson & Johnson, and Pfizer are estimated to constitute about 26 percent of Africa’s pharmaceutical market share, while South African firms Adcock Ingram, Aspen, and Cipla have a 22.3 percent share of Africa’s total pharmaceutical market. Much of the remaining market share is taken up by European firms (particularly firms from Switzerland, Germany, and France). Industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019; Goldstein Research, “African Pharmaceutical Market: Industry Analysis and Forecast 2017–2030,” June 2019.

<sup>711</sup> MarketWatch, *South African Pharmaceutical Industry 2017–2019*, July 19, 2018; Government of the Netherlands, “South African Healthcare Sector” (accessed September 9, 2019).

<sup>712</sup> MSD is known as Merck in the United States and Canada. In other markets it is known as MSD. However, Merck and MSD are listed individually by IPASA. MSD.com, “About us,” (accessed March 5, 2020). South African pharmaceutical companies Adcock Ingram and Aspen are estimated to make up approximately 15.2 and 8.9 percent of the South African pharmaceutical market, yet are not members of the Innovative Pharmaceutical Association of South Africa (IPASA). IPASA, “Membership” (accessed September 9, 2019); Goldstein Research, “African Pharmaceutical Market: Industry Analysis and Forecast 2017-2030,” June 2019.

<sup>713</sup> Generic and Biosimilars Medicines South Africa (GBMSA), “Members” (accessed February 5, 2020).

<sup>714</sup> There is no fixed deadline for enacting this proposal, and industry representatives have indicated that elections may delay implementation. Industry representative, interview with USITC staff, December 11, 2019.

<sup>715</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, June 2018, 3-4.

a depository system to a substantive search and examination (SSE) system; the introduction of the opportunity for opposition to the granting of patents both before and following formal approval of a patent through the South African Companies and Intellectual Property Commission (CIPC); and the parallel importation of pharmaceutical products in the event of a sufficient public interest (such as public health). These changes described above will be explored in greater detail in this section.

## Moving from a Depository Patent System to a Substantive Search and Examination (SSE) System

Patents are currently filed in South Africa using what is known as a “depository” system, meaning that patent filings to the Companies and Intellectual Property Commission (CIPC) face minimal oversight beyond the common test for patents (utility, novelty, non-obviousness).<sup>716</sup> Under the depository system, a patent applicant is only required to file the correct forms and pay the requisite fees to receive a patent, and scrutiny of the common tests for patents only occurs in cases where the patent is challenged in litigation.<sup>717</sup> This differs from the examination system, in which regulatory oversight contributes to the patent application process, and can lead to a patent application being rejected even without a legal challenge to the patent filing.<sup>718</sup> The depository regulatory structure in South Africa has led the CIPC to grant pharmaceutical patents at rates far higher than most countries: in one study of major pharmaceutical markets, South Africa was found to have granted a patent to 93 percent of patent applications. In contrast, 61 percent of patents in the United States were granted, 51 percent in the European Union, and 29 percent in Japan.<sup>719</sup>

Phase I proposes that the CIPC move from a depository system, as established under the Patents Act of 1978, to an SSE system in the pharmaceutical sector. (The proposal does not indicate whether it would also move patents outside the pharmaceutical sector to an SSE system.<sup>720</sup>) In particular, the Phase I proposal indicates an expected increase in oversight over the “novelty” question (the notion that a

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<sup>716</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 18.

<sup>717</sup> According to the Phase I proposal, “the Registrar of Patents, housed within the Companies and Intellectual Property Commission (CIPC), only conducts examination in relation to the formalities of the application. Hence, South Africa employs a so called ‘depository system’ in terms of which the subject of a patent application is only examined against the substantive criteria of novelty, inventive step, and industrial applicability if the patent is challenged in litigation, such as in relation to infringement or revocation.” Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, June 2018, 7.

<sup>718</sup> Under the TRIPS Agreement, both the depository and examination systems are accepted as permissible means to approve patents. Tomlinson et al., “Reforming South Africa’s Procedures for Granting Patents,” September 2015.

<sup>719</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, June 2018, 7. Based on a study by Sampat and Shadlen, “The Effects of Restrictions on Secondary Pharmaceutical Patents,” 2016.

<sup>720</sup> The proposal notes that both the Ethiopian and Egyptian patent offices, as well as the African Regional Intellectual Property Office (ARIPO), employ an SSE model in the granting of patents. Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 17–18.

product be either new or original and unusual to secure patent protection), where the burden of proof is expected to shift to patent filers to establish the novel nature of their patent.<sup>721</sup>

## Patent Opposition

Under the Patents Act of 1978, South African patent law does not permit opposition to the granting of a patent during or after its filing at the CIPC by outside parties (aside from parties with a direct interest in the patent).<sup>722</sup> Phase I proposes offering the opportunity for public intervention both before and following the granting of a patent.<sup>723</sup>

Under the proposed changes, South Africa’s pharmaceutical patenting system will include the following provisions: a third-party observation mechanism through which any interested party may file a written submission opposing the granting of a patent; a post-grant opposition mechanism by way of administrative review; and a legislative provision for the introduction of pre-grant opposition procedures following appropriate capacity building with the SSE system.<sup>724</sup> As noted in the Phase 1 proposal, many developed countries, as well as major developing-market economies, use many, if not all, of these features in their granting of pharmaceutical patents.<sup>725</sup>

## Parallel Importation

The Phase I proposal also includes a provision calling for increased use of parallel importation of pharmaceutical drugs, when a counterbalancing objective is weighed (public health being an example of a counterbalancing objective). Since parallel importation allows protected goods to be imported into a market without the rights holder’s authorization, there is a potential impact on pricing strategies for firms in individual markets when the goods are priced lower in the second market than in the original market. Although parallel imports are already legal under the South African Medicines and Related Substances Act, this proposal envisions greater use of this policy in the pharmaceutical sector. The use of parallel importation currently appears to be limited; one industry representative noted that in their 30 years in the industry, they have not identified an instance where the South African government has used parallel importation on pharmaceutical products. The representative speculated that this may be

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<sup>721</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018.

<sup>722</sup> For example, in the event that ownership of an innovation presented for patenting is contested, interested parties have the ability under the Patents Act of 1978 to seek redress with the Commissioner of Patents. The act also gives the registrar the power to refuse applications in “particular cases”—namely, when the application is “frivolous on the grounds that it claims as an invention anything obviously contrary to well-established natural laws,” or when the use of the invention could be offensive or immoral. Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 17–18; Government of South Africa, *Patents Act No. 57 of 1978*, chapter 5.

<sup>723</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018.

<sup>724</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 21.

<sup>725</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 21.

due in part to the complex legal requirements that must be met to import a product under this system, as well as the necessity of domestic registration of products.<sup>726</sup>

The Phase I proposal would therefore seek to expand the Patents Act of 1978 to remove a “narrow interpretation” that reportedly restrained the use of parallel importation. It would note that in instances where the Patents Act of 1978 and the Medicines and Related Substances Act come into conflict, carrying out parallel importation of drugs under the provisions of the Medicines Act would not constitute infringement of the Patents Act.<sup>727</sup> Use of parallel imports varies by country, and could affect the negotiating dynamic between the national government’s health agencies and private healthcare providers and pharmaceutical firms. Despite the fact that the legislation envisions only the minister of health supplying medications via parallel importation, reduced prices for a drug offered in the public sector could affect pricing for the same drugs in the private sector.<sup>728</sup>

## Industry Views on the South African Pharmaceutical Market and Proposed Changes

Industry representatives see the changes proposed by the Phase 1 proposal in South Africa as potentially impacting their firms’ operations in the market. Several representatives have noted that firms will likely need more time to secure approval for pharmaceutical patents in South Africa if this proposal is enacted, and that the likelihood of patent rejections could also rise. The impact of these developments, however, may be somewhat mixed. While some firms noted that they would likely face higher costs from the proposed changes, other firms noted that the rejection of non-genuine patents in South Africa could prevent unfair trade practices. The latter development would elevate the relative value of a patent in South Africa, and could encourage further investments.

### Increased Time for Patent Approval

As noted, several industry representatives have stated that the increased scrutiny associated with moving from a depository to substantive review process in reviewing patent applications will likely increase the already lengthy time needed to receive formal approval for a patent.<sup>729</sup> They noted that this increased time for patent approvals, coupled with other challenges in the South African market, will likely further delay the approval of pharmaceutical drugs for use in the South African market.<sup>730</sup> With the transition from a “depository” to a “substantive review process” for patent approval, the South

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<sup>726</sup> Industry representative, telephone interview by USITC staff, December 11, 2019. Phase 1 envisions that “the implementation of parallel importation will be undertaken in a controlled manner pursuant to consultations with respective stakeholders.”

<sup>727</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 21.

<sup>728</sup> Additionally, the Phase I proposal also opens the options to the use of parallel importation in other sectors beyond pharmaceuticals. Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 25.

<sup>729</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019; industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019; industry representative, interview by USITC staff, Johannesburg, South Africa, December 11, 2019.

<sup>730</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

African government is expected to hire more reviewers and/or adjudicators to examine the patent applications filed, which could potentially reduce the existing patent approval backlog.<sup>731</sup> Despite the fact that a depository system is currently in place, delays are serious: one firm indicated that to get through the entire backlog of drug approvals for the South African pharmaceutical market could take as long as eight years.<sup>732</sup> In some cases, patents receive approval for use in South Africa after they have already gone off patent in other markets.<sup>733</sup> This is due in part to a lack of sufficient regulatory capacity to process applications, which will likely also be exacerbated by the switch from a depository to an SSE system requiring greater technical expertise.<sup>734</sup> The potential impact of increased time for patent approval is unclear; while one industry representative noted that delays could be costly for firms operating in the South African market, another indicated that this may encourage investment due to stronger protection of genuinely unique patented products.<sup>735</sup>

### Increased Likelihood of Patent Rejections

Industry representatives have also noted that the patents are likely to be rejected at higher rates than under the current system, and several provisions of the Phase I proposal itself suggest the likelihood that more patent applications will be rejected than before.<sup>736</sup> According to industry representatives, the impact of this will depend on how any new law is implemented.<sup>737</sup> Industry representatives have indicated that smaller firms may be impacted more heavily than large firms due to the increased cost of collecting the necessary data for each patent filing.<sup>738</sup>

The impact of patent rejections on U.S. firms will depend in part on the direction of the patent rejections. On the one hand, the Phase I proposal has suggested that increased patent scrutiny will lead to a reduction in the approval of non-novel or flawed patents for pharmaceutical products, as the current regulatory structure has permitted patent application approvals that likely would not have been approved under an examination system.<sup>739</sup> This has been identified by industry representatives

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<sup>731</sup> The industry representative also indicated that it is unclear whether South Africa has a sufficient supply of qualified patent examiners to be hired by the government. The possible shortage of trained patent examiners could add extra time to the patent approval process. On the other hand, given the current high unemployment rate in South Africa, hiring more patent examiners could help create jobs. Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>732</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>733</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019.

<sup>734</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019.

<sup>735</sup> Industry representative, telephone interview by USITC staff, Johannesburg, South Africa, December 11, 2019.

<sup>736</sup> Government of South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 8.

<sup>737</sup> The Phase 1 proposal highlighted a South African study which found that many patents that had been accepted under the current regulatory system in South Africa would not “pass muster” under an examination system. Pouris and Pouris, “Patents and Economic Development in South Africa,” January 2011, 107.

<sup>738</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 17, 2019.

<sup>739</sup> The proposal states: “For producers, the lack of examination reduces the security of their patents, since the grant of a patent does not guarantee that the subject of the patent meets patentability criteria in the country, or that it does not contain subject matter excluded by law. Indeed, scholars from a leading South African university conducted a study which found that a significant number of patents granted in South Africa would not pass muster

operating in the South African market as a potentially positive development, as a more robust regulatory structure for patents in South Africa would likely lead to reduced competition from products that do not meet patentability criteria. This view was supported by IPASA, which stated, “[the IPASA has] no issue with substantive search and examination at all because we too do not want frivolous patents granted.”<sup>740</sup>

On the other hand, the introduction of patent opposition at several stages of the review process, where any interested party (rather than patent litigants) could oppose the patent for a variety of reasons (including public health), suggests that patent rejections may impact U.S. firms operating with branded products in sensitive health sectors. In a public submission over a substantively similar IP draft, the IPASA noted, “experience [with a pre-grant patent procedure] demonstrates that pre-grant opposition proceedings can lead to unreasonable patent application delays, introduce significant innovator uncertainty, and delay the availability of patented inventions to the market.”<sup>741</sup>

Interviews with industry representatives indicated that the likelihood of an increase in patent rejections will particularly impact smaller pharmaceutical firms. One firm indicated that the higher cost of going through the SSE process (rather than the depository process) will not discourage large pharmaceutical firms from filing patents, as those firms can mobilize enough resources to see their filings through the system.<sup>742</sup> Small firms may be less inclined to file a patent if the filing process becomes more expensive and difficult.<sup>743</sup>

Several public health advocates have indicated that the reforms to South Africa’s patent regulatory system could improve South Africans’ access to public health resources. Médecins Sans Frontières or MSF (Doctors Without Borders) indicated that the proposal is likely to increase access to generic medications for tuberculosis due to the flexibility this proposal will create by balancing protection of IPRs and public health concerns. They also expressed the belief that the proposed reforms may ensure that pharmaceutical products receiving patents are scrutinized for consistency with recognized industry standards for granting a patent.<sup>744</sup>

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under an examining system.” South Africa, Department of Trade and Industry, *Intellectual Property Policy of the Republic of South Africa Phase I*, 2018, 8.

<sup>740</sup> IPASA CEO Sebati noted, “We too do not want to see a country flooded with spurious, falsified and counterfeit medicines. We believe this will also turn the arguments and/or attempts to rubbish incremental innovation on their heads since these incremental innovations will also have to pass the rigorous patentability steps.” Pharma Intelligence, “South Africa to Tighten Up on Patentability,” August 21, 2017; IP Watch, “Legislation for South Africa’s Next IP Policy Likely,” June 11, 2018.

<sup>741</sup> IPASA, “Narrative Submission on the 2017 Draft,” November 17, 2017, 4.

<sup>742</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>743</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 16, 2019.

<sup>744</sup> MSF, “South Africa’s New IP Policy Welcomed by MSF,” May 31, 2018.

## Case Study 5.2: Filmmaking and Creative Content in Nigeria

### Summary

Filmmakers in Nigeria have a growing profile internationally, but continue to struggle to capitalize on the value of their works due to five key factors: the widespread illegal distribution of films, a public unaware of or uninterested in what IPRs entail, corruption among officials, inadequate penalties for violating copyright, and a reliance on the sale of DVDs and video compact discs (VCDs) instead of more modern means of distribution.<sup>745</sup> Problems in Nollywood (the popular term for Nigeria’s film industry) arise in large part from the practices of Nigeria’s film distributors, which have extensively influenced the industry since its early days in the 1980s and 1990s due to their highly valuable distribution networks.<sup>746</sup> The literature suggests that some Nigerian film distributors engaged in legal activities may also be engaged in certain illegal activities, such as the unlicensed distribution of copyrighted films, actions to keep out new entrants into the industry, and actions that hide certain activities from government review or oversight.<sup>747</sup> Such business practices in turn discourage foreign investment and slow Nollywood’s growth.<sup>748</sup> However, Nigeria’s government continues to work to improve its ability to effectively protect copyrights, and such efforts could reduce digital piracy and encourage foreign investment in Nollywood.<sup>749</sup>

This case study first reviews the market structure and copyright issues in Nollywood, and how the prevalence of copyright infringement has limited international investment in the industry to date. It then provides an overview of Nigeria’s current copyright laws and efforts to address copyright infringement, followed by an overview of proposed amendments to Nigerian copyright law. Finally, it describes how recent advances in Nigeria’s efforts to protect copyright and in the use of formal contracts have begun to attract international investment, as well as the major areas in which continued improvement will be key in moving Nollywood’s development forward.

### The Market for Nollywood Films in Nigeria and Abroad

As of 2011, Nigeria’s film industry was the second most productive film industry in the world in terms of the number of films produced per week, producing an estimated 50 films per week on average.

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<sup>745</sup> Olubanwo and Oguntuase, “Nigeria: Strengthening Intellectual Property Rights and Protection,” March 11, 2019; Okorie, “Nigerian Copyright Commission Roundtable Report,” February 13, 2019; International Intellectual Property Alliance, written submission to the USITC, July 24, 2019, 8; Jedlowski, “From Nollywood to Nollywood: Processes of Transnationalization,” 2013, 28.

<sup>746</sup> Jedlowski, “African Media and the Corporate Takeover,” 2017, 675.

<sup>747</sup> Jedlowski, “African Media and the Corporate Takeover,” 2017, 688–89.

<sup>748</sup> Fleishman, “Watch Out Hollywood, Nollywood Is Coming to Town,” March 19, 2019.

<sup>749</sup> Banwo and Ighodalo, “Strengthening Intellectual Property Rights and Protection in Nigeria,” September 16, 2016; Bright, “Nollywood: The New Business of African Film,” May 2, 2014; government representative, interview by USITC staff in Lagos, Nigeria, September 3, 2019; USITC, *The Sub-Saharan African Services Economy*, 2017, 133.

(Nigeria's industry ranked just after the film industry in India, known informally as Bollywood.)<sup>750</sup> However, the majority of Nollywood films are intended for straight-to-DVD or straight-to-VCD release, which limits the industry's earnings compared to its counterparts in the United States and India. A 2017 article notes that Nollywood movies typically cost between \$20,000 and \$40,000 to produce.<sup>751</sup> Box office revenues are also very low for the Nigerian film industry overall; total box office revenue was estimated to be \$12 million in 2018,<sup>752</sup> offering little incentive for international producers to invest in Nigerian films.

Most of the available data on the Nigerian film-making industry are dated. However, a 2016 article references data from the Nigerian Export-Import Bank that estimates Nollywood generates about \$590 million in revenue annually.<sup>753</sup> The same 2016 article reported that Nollywood is Nigeria's second-largest employer after agriculture, employing over one million people directly and indirectly. Other observers, however, have indicated that the Nigerian government's statistics are potentially unreliable.<sup>754</sup>

Piracy remains the largest threat to Nollywood, despite numerous and wide-ranging efforts by the Nigerian government to fix copyright infringement issues.<sup>755</sup> A 2013 United Nations report stated that almost all copies of Nollywood movies distributed abroad were unlicensed reproductions.<sup>756</sup> A frequently cited World Bank report indicated that "for every legitimate copy (of a Nigerian film) sold, nine others are pirated."<sup>757</sup> Additionally, a 2014 Nigerian Copyright Commission (NCC) report estimated that Nigeria lost over \$1 billion annually to film piracy.<sup>758</sup>

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<sup>750</sup> Moudio, "Nigeria's Film Industry: A Potential Gold Mine?" May 2013. This number includes 20 feature films per week, which excludes films produced for straight-to-DVD or straight-to-VCD release. For context, the same source, the Cultural Activities database collected by the UNESCO Institute for Statistics (UIS), lists India's weekly feature film production for the same year at approximately 25 films. UIS, Cultural Activities database ("Total Number of Feature Films Produced," accessed August 15, 2019). The most recent year available for UIS statistics on feature film production in Nigeria is 2011.

<sup>751</sup> Jedlowski, "African Media and the Corporate Takeover," 2017, 676; Moudio, "Nigeria's Film Industry: A Potential Gold Mine?" May 2013; Akande and Brown, "Moving Nigerian Filmmaking beyond Nollywood," October 2, 2018. Note that there is conflicting testimony about which is more important to the lack of ability to make money in theaters: missing infrastructure, or lost revenues due to piracy.

<sup>752</sup> PwC, *Insights from the Entertainment and Media Outlook*, October 2019, 86. Box-office revenues in Nigeria are weak for four key reasons: movie tickets cost more than the average daily earnings of a Nigerian; DVDs or VCDs can be purchased illegally or from official vendors for a fraction of the price of a movie ticket (usually on or before the theatrical release date); filmmakers save significantly by not producing their film on celluloid film for theatrical release; and there are only about 200 movie screens to serve nearly 200 million residents in Nigeria. For context, the UIS also reported that in 2011 there were 140 screens per 1 million residents in the United States. Fleishman, "Watch Out Hollywood, Nollywood Is Coming to Town," March 19, 2019; Jedlowski, "From Nollywood to Nollywood: Processes of Transnationalization," 2013, 28.

<sup>753</sup> Olubanwo and Oguntuase, "Nigeria: Strengthening Intellectual Property Rights and Protection," March 11, 2019.

<sup>754</sup> See Chima, "Active Film Distribution Companies in Nigeria," April 20, 2017. This article states that there are no statistics to confirm the reported output, revenue, and employment numbers, "because they are not facts."

<sup>755</sup> Government representative, interview by USITC staff, Lagos, Nigeria, September 3, 2019. Later in this section there is further discussion regarding the specific details of Nigeria's policy initiatives.

<sup>756</sup> Moudio, "Nigeria's Film Industry: A Potential Gold Mine?" May 2013.

<sup>757</sup> Olubanwo and Oguntuase, "Nigeria: Strengthening Intellectual Property Rights and Protection," March 11, 2019; Moudio, "Nigeria's Film Industry: A Potential Gold Mine?" May 2013.

<sup>758</sup> Schneidman, "Nollywood, Intellectual Property and Nigeria's New GDP," April 10, 2014. Based on the revenue estimates from the Nigerian Export-Import Bank and to the World Bank's estimates of the number of pirated

## Nigeria's Film Industry and Copyright Infringement

Nigeria's film industry has evolved over the years to thrive in spite of copyright infringement and other market factors. The resulting structure of the Nigerian film industry is one wholly different from the U.S. film industry, making it difficult for international investors to find a strong foothold. Due to weak box-office revenue and the low potential to recoup large investments, Nollywood focuses on producing low-budget films and earning revenue from DVD and VCD sales, a significant part of which comes from a large African community living abroad. Several industry experts have noted that widespread illegal distribution of Nigerian films increased the importance of revenue from the African expatriate community, which according to a 2017 report comprised over 30 million people worldwide.<sup>759</sup> Sources that point to the importance of that community, however, do not provide statistics that show how much revenue it generates.

Networks controlled by illegal distributors have also been regarded as a contributing factor to the industry's growth in popularity, as both legitimate and illegitimate distributors use these networks to reach broad audiences in Nigeria, other parts of Africa, and worldwide. Illegal movie distributors play a key role in facilitating Nollywood's popularity by giving consumers access to movies that the rights holders cannot afford to advertise and distribute themselves.<sup>760</sup> Sources also noted that some legitimate Nigerian distributors, commonly referred to as "marketers," even choose to sell movies directly to the pirates for circulation.<sup>761</sup> During Nollywood's early development, the ability of Nigeria's marketers to distribute videos so successfully is considered by some to indicate the fact that a number of marketers entered the legitimate market after having previously operated illegal distribution networks.<sup>762</sup>

## Nigerian Film Distributors and International Investment

Due to their frequent engagement in illegal distribution, many Nigerian marketers favor a general opacity in their operations, which continues to limit Nollywood's ability to attract international investment and produce higher-budget films.<sup>763</sup> Other distributors are reported to use piracy to keep competitors out of the market, leaking rivals' films to pirates before a film premieres.<sup>764</sup> Some of Nigeria's film distributors violate contracts in which they agree to produce and sell a certain number of

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copies available, these estimates suggest piracy has reduced revenues for Nollywood filmmakers by more than half.

<sup>759</sup> Schneidman, "Nollywood, Intellectual Property and Nigeria's New GDP," April 10, 2014; USITC, *The Sub-Saharan African Services Economy: Insights and Trends*, 2017, 132; USITC, hearing transcript, July 24, 2019, 231 (testimony of Kevin M. Rosenbaum, International Intellectual Property Alliance).

<sup>760</sup> Ncube et al., "A Principled Approach to Intellectual Property Rights and Innovation," 2019, 184; Jedlowski, "From Nollywood to Nollywood: Processes of Transnationalization," 2013, 29.

<sup>761</sup> Jedlowski, "African Media and the Corporate Takeover," 2017, 677. For the purposes of this section, the term "marketer" refers only to Nigerian film distribution companies.

<sup>762</sup> Jedlowski, "African Media and the Corporate Takeover," 2017, 675. Nigerian marketers are said by many to enjoy "unlimited power" within the industry due to their integral role in Nollywood's early success. Jedlowski, "From Nollywood to Nollywood: Processes of Transnationalization," 2013, 27.

<sup>763</sup> Jedlowski, "African Media and the Corporate Takeover," 2017, 688–89.

<sup>764</sup> Kofi Ansah, a Ghanaian producer, was unable to afford the N5 million (\$13,950) that blackmailers demanded to prevent a movie of his from being released on video before its theatrical release. Ansah stated in an interview with *Forbes Africa* that he believes his competitors orchestrated the leak to keep him from getting a foothold in the Nigerian film industry. Hyde, "The Fortune and Fury behind Nollywood," January 30, 2018.

copies of each film. If the film is successful, the distributors produce more film copies without modifying the original contract or seeking approval from the rights holder.<sup>765</sup> Additionally, some Nigerian film distributors view multinational firms as a prime target for schemes such as selling the same “exclusive” geographical rights to multiple companies.<sup>766</sup>

In response to the poor reputation of Nigeria’s marketers, instead of dealing directly with them, some international companies have opted to purchase distribution rights from other large media companies. This is the strategy used by Nollywood.tv, a popular streaming service, to acquire its library of Nollywood films; instead of going to the distributors in Nigeria, Nollywood.tv purchased the rights from South Africa’s DStv.<sup>767</sup> International film distributors have also been able to take advantage of the lack of organization among the large numbers of small Nigerian distributors to secure favorable rates for purchasing the rights to films. For example, when Africa Magic (owned by South Africa’s DStv) originally entered the Nigerian market, distributors and filmmakers could not agree to a collective response regarding pricing structure. As a result, Africa Magic negotiated with each distributor separately and secured unlimited (though not exclusive) streaming rights for \$800 to \$1,000 per film.<sup>768</sup>

A 2019 *Los Angeles Times* article notes that Netflix, when it sought to enter the African market, faced difficulties in Nigeria that included corrupt government officials, aversion to outsiders, and consumers who were more accustomed to buying DVDs than viewing films through streaming services.<sup>769</sup> iROKOtv, a streaming service and film distribution company, encountered problems described as “the hostility of local distributors who controlled Nollywood’s economy since its creation.”<sup>770</sup> Further discussion of video streaming services investment in SSA can be found in case study 7.4 in chapter 7 of this report.

## Current Copyright Environment in Nigeria

### Nigeria’s Current Copyright Laws and Enforcement Regime

Copyright law in Nigeria is administered and enforced by the Nigerian Copyright Commission (NCC). Specific to the film industry, the National Film and Video Censors Board (NFVCB) is the other major regulatory body involved in copyright regulation and enforcement in Nigeria.<sup>771</sup> Both the NCC and NFVCB have taken important steps to improve copyright protection and deter infringement.<sup>772</sup>

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<sup>765</sup> Industry representative, interview by USITC staff in Cape Town, South Africa, September 9, 2019.

<sup>766</sup> Jedlowski, “African Media and the Corporate Takeover,” 2017, 677.

<sup>767</sup> Jedlowski, “African Media and the Corporate Takeover,” 2017, 683–84.

<sup>768</sup> Jedlowski, “From Nollywood to Nollywood: Processes of Transnationalization,” 2013, 29, 42.

<sup>769</sup> Fleishman, “Watch out Hollywood, Nollywood Is Coming to Town,” March 19, 2019.

<sup>770</sup> Jedlowski, “What Netflix’s Involvement in Nigeria’s Massive Film Industry,” January 1, 2019.

<sup>771</sup> NFVCB’s responsibilities include determining the classification (rating) of domestic and foreign-produced films, and the registration of film and video outlets. More information on their standard operations can be found at their website, <https://www.nfvcb.gov.ng/about-us/>. NFVCB also works on designing programs to educate the public on copyright law and to coordinate enforcement operations with Nigerian law enforcement. Government representative, interview by USITC staff, Lagos, Nigeria, September 3, 2019.

<sup>772</sup> Other antipiracy initiatives undertaken by the Nigerian government not discussed here include Strategic Action Against Piracy (STRAP), launched in 2005 by President Olusegun Obasanjo; Project ACT Nollywood, a N3 billion (\$8 million) grant designed to combat piracy by improving the distribution systems; 2019’s “Spy Police” (“spy” is another name for “supernumerary,” or undercover, police), consisting of 150 NFVCB-trained officers focused on security, enforcement, and locating illicit trade; and the NFVCB-proposed authentication labels, intended to

Raids to seize contraband and to arrest high-level illegal distributors are reported to be common in Nigeria.<sup>773</sup> Such raids may have a deterrent effect, but according to one observer, these large-scale operations involving several officials leave themselves open to corruption: unscrupulous government officials have been reported to warn targets before a raid occurs.<sup>774</sup> In January 2019, the members of the board of the NFVCB were accused of warning raid targets, though government representatives say these accusations may be unfounded, as the NFVCB is only a semi-regulatory body with limited control over these operations.<sup>775</sup> In any case, an important step to attract international investors is to weed out corruption within the Nigerian government that undercuts anti-piracy efforts.<sup>776</sup> Both industry representatives and legal experts have pointed to the urgency of this matter.<sup>777</sup>

Stemming digital piracy—the theft of media online through illegal streaming or illegal downloads—is also a key focus of Nigeria’s government and of Nollywood’s investors. International investment in creating streaming platforms with better digital protection is reported to have reduced digital piracy overall, though there are no conclusive data available yet.<sup>778</sup>

## Proposed Changes to Nigeria’s Copyright Law

In 2015, the NCC completed the initial draft of an amendment to the Copyright Act known as Copyright Bill 2015. The aim of the Bill is to modernize Nigeria’s copyright law and to improve Nigeria’s ability to comply with any international agreements related to copyright which the government has ratified or intends to ratify.<sup>779</sup> Though it has not yet been signed into law, Copyright Bill 2015 takes important steps to update the Copyright Act, which was last amended in 1992. The Copyright Bill 2015 passed a second reading in Nigeria’s House of Representative in July 2017. Since that time, it has been before the Committees on Justice for additional input.<sup>780</sup>

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discourage the illegal distribution of films. Banwo and Ighodalo, “Strengthening Intellectual Property Rights and Protection in Nigeria,” September 16, 2016; Hyde, “The Fortune and Fury behind Nollywood,” January 30, 2018; Olomu, “NFVCB Officials Now SPY Policemen,” August 4, 2019; Punch, “NFVCB to Authenticate Nollywood Movie Labels,” March 15, 2019.

<sup>773</sup> Raids in recent years have seized millions of dollars of pirated materials. The purpose of raids is to arrest the people at the top of Nigeria’s piracy networks and seize illegal merchandise, not to target the low-level workers. Government representative, interview by USITC staff in Lagos, Nigeria, September 3, 2019; Ihuoma, “NFVCB Clamps Down on Pornographic, Unclassified Film Vendors,” July 24, 2019; Kuwonu, “OPINION: Nigeria’s ‘New Oil’ Export Is Beating the Charts,” May 28, 2018.

<sup>774</sup> Hyde, “The Fortune and Fury behind Nollywood,” January 30, 2018.

<sup>775</sup> Daniel, “Movie Producers Call for Dissolution of Film, Video Censors,” January 2, 2019; government representative, interview by USITC staff in Lagos, Nigeria, September 3, 2019.

<sup>776</sup> Daniel, “Movie Producers Call for Dissolution of Film, Video Censors,” January 2, 2019; Olubanwo and Oguntuase, “Nigeria: Strengthening Intellectual Property Rights and Protection,” March 11, 2019.

<sup>777</sup> Ihuoma, “NFVCB Clamps Down on Pornographic, Unclassified Film Vendors,” July 24, 2019; Olubanwo and Oguntuase, “Nigeria: Strengthening Intellectual Property Rights and Protection,” March 11, 2019.

<sup>778</sup> Bright, “Nollywood: The New Business of African Film,” May 2, 2014; government representative, interview by USITC staff in Lagos, Nigeria, September 3, 2019. Note, however, that some sources indicate that Nollywood’s piracy problems have been compounded by the availability of streaming services enabling the unauthorized streaming of films. USITC, *The Sub-Saharan African Services Economy*, 2017, 133.

<sup>779</sup> NCC, *Draft Copyright Bill 2015*, 2015, 1. The WIPO treaties are particularly significant for the growth of Nigeria’s film industry. See the overview section of this chapter for a further discussion. WIPO, “Nigeria Joins Four Key Copyright Treaties,” October 4, 2017.

<sup>780</sup> PLAC, “Bill to Amend Copyright Act Passes Second Reading,” June 7, 2017.

Two of the most important contributions of the draft Copyright Bill 2015 are (1) increasing the financial penalties for illegally producing and distributing films and (2) adding regulations covering modern forms of copyright violation that did not exist when the law was last amended nearly 30 years ago. According to some observers, the bill represents a major step in establishing a significant financial deterrent to producing and selling films illegally, a weak area in the existing law.<sup>781</sup> It also establishes rules and penalties regarding modern forms of copyright violation that are completely absent in the current Copyright Act. The provisions most closely related to the operations of the film industry are highlighted in table 5.4. These changes are considered to be important for Nigeria’s creative industries as a whole and likely to improve its ability to attract further investment from international streaming platforms and production companies.<sup>782</sup>

**Table 5.4** Summary of proposed changes to Nigeria’s copyright law most relevant to Nollywood

	<b>Current copyright law: Copyright Act (Chapter 28 Copyright Laws)</b>	<b>Proposed bill: Copyright Bill 2015</b>
<b>Changes to fines</b>		
Criminal liability	N100 fine per pirated copy sold and six months in prison	<ul style="list-style-type: none"> <li>• N500 fine per pirated copy sold and up to three years in prison</li> <li>• N1,000,000 fine and up to five years in prison for broadcasting or commercially using a work without permission</li> <li>• N200,000 fine and up to 12 months in prison for refusing to pay a royalty</li> </ul>
Duty of publishers, printers, etc.	N10,000 fine for failing duty to protect copyright	N100,000 fine for failing duty to protect copyright
Anti-piracy measures	<ul style="list-style-type: none"> <li>• N100,000 for providing assistance for contravening anti-piracy devices</li> <li>• N500,000 fine for owning a device that can contravene anti-piracy devices</li> <li>• N50,000 for counterfeiting anti-piracy devices</li> </ul>	<ul style="list-style-type: none"> <li>• N500,000 fine for providing assistance for contravening anti-piracy devices</li> <li>• N1,000,000 fine for owning a device that can contravene anti-piracy devices</li> <li>• N200,000 fine for counterfeiting anti-piracy devices</li> </ul>
<b>Addition of modern copyright provisions</b>		

<sup>781</sup> Olubanwo and Oguntuase, “Nigeria: Strengthening Intellectual Property Rights and Protection,” March 11, 2019; industry representative, interview by USITC staff in Lagos, Nigeria, September 3, 2019.

<sup>782</sup> International Intellectual Property Alliance, written submission to the USITC, July 24, 2019, 8.

	Current copyright law: Copyright Act (Chapter 28 Copyright Laws)	Proposed bill: Copyright Bill 2015
Technological measures to protect copyright	None	Sections 44–46: <ul style="list-style-type: none"> <li>Rules against circumventing technological measures designed to protect copyright and identify the copyright owner</li> <li>N1,000,000 fine for importing or manufacturing a device to circumvent technological copyright protection measures; N500,000 fine for selling such a device; N200,000 fine for assisting someone in using such a device</li> </ul>
Provisions relating to online content	None	Sections 47–54: <ul style="list-style-type: none"> <li>Procedure related to the removal of infringing material from the internet</li> <li>Rules regarding the suspension of accounts that repeatedly post materials which violate copyright</li> <li>Rules exempting networks or systems from liability if others post copyright-infringing materials on their site</li> <li>Recourse for copyright owners when they find their materials posted online illegally</li> </ul>
Nigerian Copyright e-Registration System (NCeRS)	None	Makes the maintenance of the Nigerian Copyright e-Registration System (established by the NCC in 2014) a statutory obligation <sup>a</sup>

Source: NCC, *Nigerian Copyright Act, 2004*; NCC, *Draft Copyright Bill 2015, 2015*.

Note: N = Nigerian naira. N100 = \$0.28; N500 = \$1.38; N50,000 = \$137.94; N100,000 = \$275.88; N200,000 = \$551.76; N1,000,000 = \$2,758.80. XE Currency Converter, <https://www.xe.com/currencyconverter/> (accessed January 27, 2020).

<sup>a</sup> More information on the National Copyright e-Registration System is available on the “About NCeRS” page, <http://www.eregistration.copyright.gov.ng/ncc/about>.

## Impact of the IP Environment on International Investment in Nollywood

### Recent Advances in Nollywood

In recent years, Nollywood has experienced a period of “formalization” in which more movies are receiving theatrical releases, filmmakers and distributors are using formal contracts to govern their dealings with each other, and the industry is beginning to attract investment from the United States and other sources.<sup>783</sup> Growing box-office revenues in Nigeria demonstrate the country’s increased interest in theatrical releases: according to research by PwC, box-office revenue in Nigeria grew by 36 percent

<sup>783</sup> USITC, *The Sub-Saharan African Services Economy*, 2017, 133.

between 2017 and 2018—from \$17.3 million to \$23.6 million.<sup>784</sup> The shift to formal contracts by many Nollywood producers is considered to be key, as international demand for theatrical releases of Nollywood films grows: filmmakers must be able to prove copyright ownership to do business in many developed countries.<sup>785</sup>

While Nollywood has begun to see international investment in streaming and in film production, films with low production quality that are targeted at a local audience remain the predominant Nollywood product.<sup>786</sup> In order to attract investment, some film distributors have endeavored to produce reliable statistics on the industry’s profitability: Nollywood.tv and iROKOTv, for example, have attracted significant investment due to their ability to produce reliable data on their services and on the industry.<sup>787</sup> Recent investment from streaming services in film production has produced a few examples of films with higher production quality, such as Netflix’s 2018 film *Lionheart*. However, according to industry representatives, the emphasis on low-production-cost films remains a deterrent to Nollywood gaining a larger international audience or receiving significant investment from abroad.<sup>788</sup>

The Nigerian government has also invested significantly in efforts to facilitate the formalization of Nollywood and encourage international investment, but the benefit of these government programs is limited due to a lack of basic copyright protection. Examples of government initiatives include “pioneer status” for Nollywood investors, which grants a reprieve from Nigeria’s 20 percent corporate income tax.<sup>789</sup> Industry representatives note that these incentives are frequently helpful in attracting investment, but assert that without first improving copyright protection, these initiatives will have a limited benefit.<sup>790</sup>

## Areas with Continued Need for Growth

According to several experts, the key areas in which Nigeria must continue to improve are the areas in which it has historically been weak: Nigeria must improve its IP enforcement by improving the legal infrastructure, by educating lawmakers and citizens, and by eliminating corruption among officials.<sup>791</sup> The International Intellectual Property Alliance (IIPA) has emphasized that Nigeria’s government needs to fully implement the IP treaties it has ratified, especially the WIPO Internet Treaties, given their importance for the development of streaming in Nigeria.<sup>792</sup> Experts also recommend improving case law on copyright as an important goal moving forward, as robust case law improves the copyright

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<sup>784</sup> AFP, “Nigeria’s Nollywood Film Industry Reels in Foreign Investors,” July 7, 2019.

<sup>785</sup> UNECA, *Next Steps for the African Continental Free Trade Area*, 2019, 122.

<sup>786</sup> Industry expert, telephone interview by USITC staff, January 7, 2020.

<sup>787</sup> Jedlowski, “African Media and the Corporate Takeover,” 2017, 689. Further discussion of Netflix and iROKOTv’s activities in sub-Saharan Africa can be found in chapter 7 of this report, “The Digital Economy in SSA.”

<sup>788</sup> Industry expert, telephone interview by USITC staff, January 7, 2020.

<sup>789</sup> More information on “pioneer status” is available at the website of the Nigerian Investment Promotion Commission: <https://nipc.gov.ng/pioneer-status-incentive/>. Other examples of government initiatives include the N-Power for Creatives initiative (a venture capital fund for filmmakers established by the Nigerian government) and NFVCB’s “Nigeria in the Movies” initiative.

<sup>790</sup> Industry expert, telephone interview by USITC staff, January 7, 2020.

<sup>791</sup> Okorie, “Nigerian Copyright Commission Roundtable Report,” February 13, 2019; Olubanwo and Oguntuase, “Nigeria: Strengthening Intellectual Property Rights and Protection,” March 11, 2019; International Intellectual Property Alliance, written submission to the USITC, July 24, 2019, 8.

<sup>792</sup> International Intellectual Property Alliance, written submission to the USITC, July 24, 2019, 8. For further discussion of the WIPO treaties, see the overview section of this chapter.

enforcement process by refining and clarifying the law.<sup>793</sup> The IIPA emphasized the need for Nigeria to “build capacity” to improve public awareness of IP crimes and to make content creators aware of the legal tools available to protect copyrights against various forms of cybercrime.<sup>794</sup>

## Case Study 5.3: Ethiopia’s Trademark Protection System and Its Need for Greater Enforcement

### Summary

Despite being one of the fastest-growing economies and largest recipients of FDI in SSA since 2017, Ethiopia has had challenges with regard to its system of trademark protection and enforcement.<sup>795</sup> Trademarks are protected under Ethiopian law. However, as in many SSA countries, trademark infringement activity has been characterized as “widespread” by USTR, and local IPR experts have identified considerable capacity constraints pertaining to the country’s trademark enforcement mechanisms.<sup>796</sup> To address these issues, and to align reform efforts with other official development initiatives, Ethiopia’s government has begun spreading awareness of the importance of trademark protection, improving procedural mechanisms to stimulate reliance on its trademark registration system, and deepening the technical expertise of its trademark examiners in recent years.<sup>797</sup> These efforts appear to have spurred modest improvements to business conditions and created a sense of optimism about the future. Nevertheless, deeper trademark reform appears to be needed before it can become a significant factor in promoting trade and investment growth in Ethiopia.

Government authorities in Ethiopia appear optimistic that their trademark protection and enforcement reforms will stimulate trade and investment flows,<sup>798</sup> pointing to several initiatives as positive signs of reform. These include (1) the creation of a new online trademark filing system; (2) new licensing and registration requirements for trademark agents;<sup>799</sup> (3) the hiring of additional and more qualified

<sup>793</sup> Olubanwo and Oguntuase, “Nigeria: Strengthening Intellectual Property Rights and Protection,” March 11, 2019.

<sup>794</sup> International Intellectual Property Alliance, written submission to the USITC, July 24, 2019, 8. Steps that the Nigerian government has already taken include participating in the Global Intellectual Property Academy (GIPA), a program offered by the United States Patent and Trademark Office (USPTO) that provides support and technical assistance toward building capacity to protect intellectual property. USTR, *2018 Biennial Report*, June 29, 2018, 79.

<sup>795</sup> IMF, *Regional Economic Outlook: Sub-Saharan Africa Recovery*, appendix A4, April 2019; Deloitte, “Invest in Ethiopia: Structural Reforms Set,” June 2019.

<sup>796</sup> USTR, *National Trade Estimate and Foreign Trade Barriers Report*, 2019, 163; interviews with industry representatives, academics, and local IPR experts by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>797</sup> Since 2010, Ethiopian government economic reforms have been focused on core structural and poverty alleviation efforts, as articulated in its “Growth and Transformation Plan” (GTP). But as Ethiopia’s GTP reforms have evolved from their Phase 1 to Phase 2 stages, greater emphasis has been placed on improving conditions that will stimulate domestic innovation, such as IPR reforms.

<sup>798</sup> Government officials, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>799</sup> Private sector representative, interview by USITC staff, Addis Ababa, Ethiopia, January 4, 2020.

trademark examiners;<sup>800</sup> (4) greater technical training of Ethiopian Intellectual Property Office (EIPO) staff by experts from international institutions (e.g., WIPO, the U.S. Patent and Trademark Office, the European Patent Office); (5) recent changes to Ethiopian investment and franchising laws; and (6) expanding IPR educational outreach by EIPO to law enforcement, other branches of government, and multiple strands of Ethiopian society.<sup>801</sup>

In addition to these reforms, Ethiopia's implementation of new trademark laws in 2013, its ongoing WTO accession negotiations, and its record of sustaining its policy commitments appear to have generated some tangible results. For example, Ethiopia has exhibited robust growth in trademark filings over the past five years, which empirical studies on branding in other countries suggest has been associated with increased investment.<sup>802</sup> Over the same period, a significantly greater share of its trademark applicants have been from domestic sources. Finally, modest improvements to its business environment indicators, which tend to influence trade and investment flows, have also materialized.<sup>803</sup>

This case study will describe Ethiopia's system of trademark protection and enforcement, including its relevant laws and enforcement mechanisms. It will also highlight some of Ethiopia's key trademark enforcement issues and discuss how these issues are likely to affect trade and investment flows. In doing so, this analysis will describe what is known about the magnitude of the trademark infringement problem, the enforcement shortfalls that largely underlie the problems, and the country's reform efforts. Ethiopia serves to illustrate possible responses to such issues in SSA, since its robust economic growth and commitment to fulfill policy goals highlight what can be done to combat rampant regional trademark infringement while promoting development objectives. Given the dearth of publicly available information, this analysis principally relies on qualitative information gathered from interviews with government, academic, legal and business officials during the Commission's fieldwork in Ethiopia.

## Ethiopia's Trademark Protection and Enforcement System, and Its Effectiveness

This section describes the institutional structure of Ethiopia's system of trademark protection and enforcement. It highlights the fact that while Ethiopia is not a signatory to many important international treaties on trademark protection or related IPR matters, its laws incorporate many of the baseline protections required by international agreements such as the TRIPS Agreement. This section also draws attention to prevailing views that Ethiopia's major trademark problem stems mostly from the implementation of prevailing laws, and describes major institutional deficiencies that have contributed to its enforcement challenges. This section concludes with what is known about the size and persistent nature of trademark infringement in Ethiopia.

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<sup>800</sup> Government officials, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>801</sup> A proposed draft investment law clarifies the definition of "capital" to include intangible assets such as intellectual property. Defining intellectual property such as trademarks as an asset class offers investors a means by which to evaluate potential damages. Along with the newly legal status of franchising, this change is anticipated to dissuade trademark infringement, especially in the services sector, and promote investment. Government officials and legal expert, interview by USITC staff, Addis Ababa, Ethiopia, January 7, 2020.

<sup>802</sup> WIPO, *World Intellectual Property Report*, 2013.

<sup>803</sup> World Bank, *Ease of Doing Business Report*, 2019.

## Institutional Structure of Trademark Protection and Enforcement

Ethiopia’s Trademark Registration and Protection Proclamation 501/2006 (Proclamation) has served as the country’s governing law on trademark protection since it entered into force in 2013. The law seeks to “protect the reputation and goodwill of business persons . . . by protecting trademarks to avoid confusion between similar goods and services.”<sup>804</sup> Civil remedies and/or criminal remedies can be used against trademark infringers.<sup>805</sup>

EIPO administers applications for trademark and all other forms of IP. This represents a streamlining of responsibilities, since before EIPO was established in 2003, these functions were performed by at least three different official institutions.<sup>806</sup> Although EIPO is an autonomous government body responsible for implementing national IP laws, it is accountable to the Ministry of Innovation and Technology.<sup>807</sup> Infringement problems that escalate into legal cases are presided over by Ethiopia’s Federal High Court, and the Ethiopian Customs Authority is responsible for withholding imported or exported goods if they are suspected of violating trademark or any other IP laws.<sup>808</sup>

Special “formality examiners” review trademark applications for eligibility, form, and content. Domestic and foreign firms alike are eligible for trademark protection under the law, but foreign firms must certify that they undertake commercial activity in the domestic market in order to be granted trademark protection.<sup>809</sup> If the form or content provided in the trademark applications is considered insufficient, EIPO is expected to notify applicants and provide enough time for correction. Once corrections are made and the trademark application is resubmitted, EIPO publishes a notice inviting opposition,<sup>810</sup> and “substantive examiners” investigate as needed.<sup>811</sup> If no meritorious oppositions are filed or determined, EIPO registers the trademark, leaving a 60-day window for appeal.

Ethiopia’s trademark and related IPR laws—with some of their limitations described in the next section—are considered to be “more or less clear, comprehensive, and in touch with current global and national developments.”<sup>812</sup> This view is shared by the preponderance of interviewed Ethiopian representatives, including attorneys in the private sector and academia, even though, as noted, Ethiopia

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<sup>804</sup> Government of Ethiopia, Trade Mark Registration and Protection Proclamation 501/2006, 3441, “Preamble.”

<sup>805</sup> Fikadu Asfaw and Associates Law Office, “Why and How to Protect your Trademark in Ethiopia,” 2013.

<sup>806</sup> These included the Ethiopian Science and Technology Commission (responsible for the administration and management of patent, utility model, and industrial designs), the Ministry of Youth, Sport, and Culture (responsible for copyright issues), and the Ministry of Trade and Industry (responsible for trademark issues). The changing structure of accountability appears to have compromised the EIPO’s effectiveness over the past two decades. WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>807</sup> Government officials, interviews by USITC staff, Addis Ababa, Ethiopia, September 30– October 2, 2019.

<sup>808</sup> Morrison and Foerster, “IP Guidelines for Members of the Global Off-Grid Lighting Association,” March 2017.

<sup>809</sup> Adams & Adams, “Trade Marks in Ethiopia,” July 4, 2018.

<sup>810</sup> Fikadu Asfaw and Associates Law Office, “Trademark Registration Procedures under Ethiopian Law,” (accessed September 20, 2019).

<sup>811</sup> Government officials, interviews by USITC staff, Addis Ababa, Ethiopia, October 1, 2019; EIPO, “The Ethiopian IP System,” October 2019.

<sup>812</sup> Abdo, “Legislative Protection of Property Rights in Ethiopia,” December 2013, 196.

is not party to many major international IPR treaties.<sup>813</sup> Specifically, Ethiopia is not a member of the WTO or its TRIPS Agreement, the Paris Convention for the Protection of Industrial Property, the WIPO copyright treaty, the Berne Convention for Literary and Artistic Works, the Madrid System for the International Registration of Marks, the Patent Cooperation Treaty, and others.<sup>814</sup> Nevertheless, according to one interviewed attorney, “the Paris Convention is substantially incorporated in various parts of the Ethiopian trademark law and regulation.”<sup>815</sup>

Interviewed EIPO officials stated that as of October 2019, Ethiopia was in the process of becoming a signatory to the Paris, Madrid, and Berne agreements, and has been taking part in ongoing WTO accession negotiations for almost two decades.<sup>816</sup> The protracted nature of its WTO accession was largely a result of Ethiopia’s reluctance to liberalize its economy and open certain sectors up to FDI until recent years. However, according to one observer, as of 2018, Ethiopia had shown progress in allowing the private sector to grow (particularly in the telecommunications and power sectors) and in allowing foreign firms to bid on infrastructure investment projects.<sup>817</sup>

## Trademark Protection and Enforcement Challenges

Many of the government officials, academics, attorneys, and private sector representatives that were interviewed noted substantive challenges in Ethiopia’s system of trademark enforcement. Some of the most frequently cited issues include a systemic lack of awareness of the importance and existence of IPR laws; limitations of Ethiopia’s existing trademark laws; insufficient technical expertise among authorities; and ineffective interagency coordination. These and others are described in more detail below.

**Broader IP Awareness Issue.** EIPO has undertaken wide-ranging outreach efforts to increase the public’s awareness of IP issues. Private sector attorneys, business representatives, and academics have emphasized the need for such extensive outreach, suggesting that there is a profound lack of awareness of the existence and importance of IPR rights and trademark protections across multiple segments of Ethiopian society.<sup>818</sup> Government officials and industry representatives have added that broader IPR awareness is not only a problem with the Ethiopian public, but also with IPR enforcement bodies.<sup>819</sup> Most government officials, industry representatives, and IPR experts interviewed suggested that this includes the police, who are often focused on immediate safety issues, and judges, who lack technical

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<sup>813</sup> Government officials, industry representatives, and IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30, 2019–October 2, 2019.

<sup>814</sup> However, Ethiopia is a signatory to the Nairobi Treaty and the Convention Establishing the World Intellectual Property Organization Accession Proclamation, No 90/1997. USDOC, “Ethiopia: Protecting Intellectual Property,” October 30, 2010.

<sup>815</sup> Ethiopian attorney, email to USITC staff, December 31, 2019.

<sup>816</sup> EIPO, “The Ethiopian IP System,” October 2019.

<sup>817</sup> Biresaw, “WTO Accession: The Possible Benefits for Ethiopia,” August 2018.

<sup>818</sup> Industry representatives, academics, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>819</sup> Government officials, industry representatives, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

expertise in IPR laws and are frequently lenient with infringers who claim ignorance of the laws.<sup>820</sup> Even domestic brand owners, whose businesses depend on the protection of their trademarked names, often fail to follow international practices such as including trademarks as assets on their balance sheets.<sup>821</sup> This lack of awareness may help explain why domestic firms represented a minority of Ethiopia’s trademark applications over the past decade—though this has changed in the past two years, as explained below.<sup>822</sup>

**Limitations in Trademark Law.** Industry representatives and local IPR experts criticized several aspects of Ethiopia’s governing law on trademark protection and enforcement, including its failure to protect geographic indications (GIs),<sup>823</sup> franchising provisions,<sup>824</sup> and specific characteristics of goods and services that are considered integral to brand identity (e.g., adjectives, sounds, smells, color patterns).<sup>825</sup> They also cited as problematic Ethiopia’s requirements that foreign firms establish a business footprint in Ethiopia to be eligible for trademark protection, as well as its unclear regulations concerning the status of old trademarks that were found to have infringed upon well-known global brands.<sup>826</sup>

**First-to-File Issue.** Ethiopian trademark registration is done on a first-come, first-served basis. According to WIPO, this has encouraged infringement by local actors unaffiliated with globally trademarked companies, as they often register such company names before the foreign firms even enter the Ethiopian market.<sup>827</sup> As a result, many domestic IP attorneys advise foreign clients to apply for trademark protection even before selling products or services locally.<sup>828</sup>

**Administrative Deficiencies.** Substantive administrative challenges appear to have hindered trademark enforcement in Ethiopia. For example, the U.S. State Department found that EIPO generally “has weak

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<sup>820</sup> Industry representatives, academics, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30– October 2, 2019; WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>821</sup> Industry representative, interview by USITC staff, Addis Ababa, Ethiopia, October 1, 2019.

<sup>822</sup> EIPO, “The Ethiopian IP System,” October 2019; All Africa, “Ethiopia: Trademark Protecting Businesses,” February 28, 2018.

<sup>823</sup> According to WIPO, a geographical indication is a sign used on products that have a specific geographical origin and possess qualities, characteristics, or a reputation that are due to that origin. In order to function as a GI, a sign must identify a product as originating in a given place. See WIPO website ([https://www.wipo.int/geo\\_indications/en/](https://www.wipo.int/geo_indications/en/)). Ethiopia’s failure to protect GIs is inconsistent with the TRIPS Agreement, and is likely to complicate Ethiopia’s WTO accession process. Government officials, industry representatives, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30– October 2, 2019.

<sup>824</sup> Although the Ethiopian Parliament has allowed franchising to occur as of 2016, many IP enforcement issues still exist. USDOC, ITA, “U.S. Commercial Guide: Ethiopia,” 2017.

<sup>825</sup> Abdo, “Legislative Protection of Property Rights in Ethiopia,” December 2013 (accessed through African Journals Online, November 11, 2019).

<sup>826</sup> Industry representatives and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30– October 2, 2019.

<sup>827</sup> WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>828</sup> USDOC, Commercial Services, “Doing Business in Ethiopia: 2012 Country Commercial Guide for U.S. Companies,” 2013 and 2014, 45.

capacity in terms of manpower and none in terms of law enforcement.”<sup>829</sup> Representatives of the International Trademark Association (INTA) and other interviewed officials pointed to poor IP expertise among examiners, customs officials, police, and judges as areas which inhibit improved trademark reviews and enforcement.<sup>830</sup> Some industry representatives cited difficulties examiners have had in identifying well-known trademarks.<sup>831</sup> Government officials have indicated that in the past, examiners did not check to see if trademarks are registered outside of Ethiopia, as they are not party to any agreement that would obligate them to do so. These officials state that the lack of internet access frequently precluded the examiners from checking even if they wanted to. Critics claim that trademark protection should be granted to “well-known brands” regardless of whether they are domestically filed or not.<sup>832</sup> However, challenges remain in assessing the degree to which such a brand is sufficiently well known, and how, exactly, Ethiopian law should protect it.<sup>833</sup> Government officials explained that austere budgetary conditions limit the hiring of better-trained officials, encourage turnover, and prevent needed upgrade of facilities.<sup>834</sup>

Recent litigation in Ethiopia concerning the InterContinental hotel brand illustrates some of the challenges these issues present to foreign brands that seek to enter the Ethiopian market, even when they may be considered well known elsewhere. In 2013, InterContinental Hotels Group (IHG) brought suit in Ethiopia against JH Simex to cease operating a hotel in the capital city using the name InterContinental Addis Ababa Hotel.<sup>835</sup> After six years of litigation, Ethiopia’s Federal High Court ordered JH Simex to stop using the infringed trademark name on its central Addis Ababa building, advertisements, website, and paraphernalia.<sup>836</sup> Although IHG won this case, it was only awarded \$23,416 in damages, since the defendant did not produce information which could document its profits in prior years. Moreover, IHG’s recommendation that the court gather tax records from the relevant authorities was ultimately rejected.<sup>837</sup>

Ethiopian government officials familiar with EIPO’s initial decision to grant the trademark to JH Simex indicated in interviews with Commission staff that they were unaware of IHG’s global brand and did not have internet access to conduct research at the time of application. Upon learning of the global InterContinental brand, officials said that they took action to cancel the mark. However, in interviews

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<sup>829</sup> USDOC, Commercial Services, “Doing Business in Ethiopia: 2012 Country Commercial Guide for U.S. Companies,” 2013 and 2014, 45.

<sup>830</sup> EIPO, “The Ethiopian IP System,” October 2019; INTA, “Comments on Draft Intellectual Property Policy,” October 2018.

<sup>831</sup> Industry representatives and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>832</sup> Industry representatives and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>833</sup> Fikadu Asfaw and Associate Law Office, “Well-Known Trademarks and Ethiopian Law” (accessed September 20, 2019); Lince, “Counterfeit Hotspots in Ethiopia,” October 17, 2019.

<sup>834</sup> EIPO, “The Ethiopian IP System,” October 2019.

<sup>835</sup> *Capital Ethiopia*, “Intercontinental Addis Ordered to Change Name,” March 10, 2019; *Addis Fortune*, “Intercontinental to Face-Off in Court Again,” October 18, 2016.

<sup>836</sup> *Capital Ethiopia*, “Intercontinental Addis Ordered to Change Name,” March 10, 2019; *Addis Fortune*, “Intercontinental to Face-Off in Court Again,” October 18, 2016.

<sup>837</sup> *Capital Ethiopia*, “Intercontinental Addis Ordered to Change Name,” March 10, 2019; *Addis Fortune*, “Intercontinental to Face-Off in Court Again,” October 18, 2016.

with Commission staff in October 2019, industry representatives noted that the infringing sign of the hotel still stood in the heart of Addis Ababa, even after IHG won its court challenge in March 2019, casting doubt on whether the political will exists to enforce even high-profile cases of IP infringement.<sup>838</sup> While considerable trademark reforms have been made in recent history, the InterContinental example showcases the difficulties foreign brand holders have had in entering or protecting their brands in Ethiopia and obtaining meaningful enforcement measures.<sup>839</sup>

Observers reported other administrative deficiencies, including the lack of a specialized IP court (whose planning has been in the works for several years),<sup>840</sup> the lack of transparency in EIPO arbitration decisions,<sup>841</sup> and outdated notification processes (the government previously published trademark application information in a federal newspaper called *The Intellectual Property Gazette*). Industry representatives and local IPR experts focused on what they described as the unpredictability of the system. According to these commentators, examples of this unpredictability range from trademark examiners' unique interpretations of prevailing law to court decisions that they considered to be arbitrary. Some practitioners stated that they have found it useful to develop personal relationships with trademark examiners to help them navigate through technical issues, sort out classification complications, and ultimately register the trademarks.<sup>842</sup> Some industry representatives said that they found the administrative deficiencies so extensive that they gave up on their domestic trademark application altogether and focused their efforts outside the country.<sup>843</sup>

Intra-governmental coordination also appears to be a major problem with trademark enforcement.<sup>844</sup> For example, interactions between trademark rights holders and the local police were characterized as so challenging that some law firms took it upon themselves to investigate counterfeit sales activity in venues such as Mercato, a massive open-air market in Addis Ababa.<sup>845</sup> Government officials even mentioned that their coordination with related agencies, including border control institutions, has been constrained.<sup>846</sup>

## Extent of Trademark Infringement in Ethiopia

Trademark infringement activity and the sale of counterfeit goods from abroad appears extensive in Ethiopia, and emblematic of such problems in SSA as a whole. Interviewed representatives confirm that

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<sup>838</sup> Industry representatives and local IPR experts, interviews by USITC staff Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>839</sup> Industry representatives and local IPR experts, interviews by USITC staff Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>840</sup> A specialized IP court has recently been established, as described in Table 5.4.

<sup>841</sup> Industry representatives and local IPR experts, interviews by USITC staff Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>842</sup> Industry representatives and local IPR experts, interviews by USITC staff Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>843</sup> Industry representatives and local IPR experts, interviews by USITC staff Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>844</sup> Industry representatives and local IPR experts, interviews by USITC staff Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>845</sup> IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>846</sup> Government officials, interviews by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

counterfeiting is pervasive in Ethiopia, and that police interdiction is bureaucratic, rare, and broadly ineffective.<sup>847</sup> While Ethiopia's government does not publish statistics on counterfeit seizures, qualitative assessments have been made about the prevalence of trademark infringement activity in the country.<sup>848</sup> For example, for more than a decade USTR has stated that Ethiopia's IP protection and enforcement measures have been "a serious concern" and that trademark infringement in particular "appears to be widespread."<sup>849</sup> More recently, it stated that EIPO has "taken virtually no action to confiscate pirated foreign works in Ethiopia, or to impede the sale of pirated goods."<sup>850</sup> The UK's Ministry of International Trade has even said that "some prominent international hotel names are used by local business people in Ethiopia with the trademark infringement either condoned or ignored by EIPO" (the InterContinental case above is an example).<sup>851</sup>

While only partial information is available, the effects of trademark infringement in Ethiopia appear to extend to a number of different sectors. The U.S. Department of Commerce found that infringement of U.S. trademarks has been rampant in the hospitality and retail service sectors.<sup>852</sup> The U.S. Embassy in Addis Ababa found that infringement appears to mostly affect tourism and other service industries from various foreign countries, as firms "operate freely in Ethiopia using well-known trademark names or symbols without legal permission."<sup>853</sup> Several private sector sources noted that counterfeit pharmaceutical and cosmetic sales are widespread.<sup>854</sup> One attorney explained that Ethiopian trademark infringement occurs across multiple sectors on "products which acquired reputation and acceptance in the global market."<sup>855</sup>

Trademark infringement activity in Ethiopia is believed to consist mainly of two activities: sales of counterfeit goods and services imported from other markets, and domestic infringement of well-known brands. As mentioned earlier, the Mercato in Addis Ababa, like other large open-air urban markets in Kenya, Nigeria, and other SSA countries, is considered a hotbed for sales of counterfeit products. Fake luxury items such as watches, jewelry, electronics, clothes, personal care items, media, and food items are commonly offered for sale there.<sup>856</sup> According to government officials, industry representatives, and legal practitioners, most of these products are thought to be imported from China via Kenya, Djibouti,

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<sup>847</sup> Government officials, industry representatives, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30– October 2, 2019.

<sup>848</sup> USDOC, "Ethiopia—Protecting Intellectual Property," October 30, 2010.

<sup>849</sup> USTR, *National Trade Estimate and Foreign Trade Barriers Report*, 2013, 190; USTR, *National Trade Estimate and Foreign Trade Barriers Report*, 2019, 163.

<sup>850</sup> USTR, *National Trade Estimate and Foreign Trade Barriers Report*, 2011, 130, 190.

<sup>851</sup> Government of the United Kingdom, Department of International Trade, "Guidance: Overseas Business Risk—Ethiopia," updated May 2018.

<sup>852</sup> USDOC, "Ethiopia—Protecting Intellectual Property," October 30, 2010.

<sup>853</sup> USDOC, Commercial Services, "Doing Business in Ethiopia: 2012 Country Commercial Guide for U.S. Companies," 2013 and 2014, 45.

<sup>854</sup> Industry representatives and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, September 30, 2019; Lince, "Counterfeit Hotspots in Ethiopia," October 17, 2019.

<sup>855</sup> Fikadu Asfaw Demissie is a partner at Fikadu Asfaw and Associates Law Office. Lince, "Counterfeit Hotspots in Ethiopia," October 17, 2019.

<sup>856</sup> Hicks, "In Nigeria, Chinese Investment Comes with a Downside," December 5, 2015; Nwuneli, "Fake Processed Food Is Becoming an Epidemic in African Urban Life," March 10, 2018; Lince, "Counterfeit Hotspots in Ethiopia," October 17, 2019; industry representatives, interviews by USITC staff, Addis Ababa, Ethiopia, October 1, 2019.

and Dubai, UAE. Other locations where such violations are suspected of taking place include Ethiopia's new industrial parks, where fraudulent use of trademark-protected molds in manufacturing is reported to be taking place.<sup>857</sup>

Home-grown infringement of well-known brands is thought to be widespread in Ethiopia's services sector. Firms that appear to be infringing upon trademarked names such as Intercontinental, Home Depot, and KFC are operating in plain sight in urban centers.<sup>858</sup> Kaldi's, Ethiopia's biggest coffee chain, has a green and white logo that is strikingly similar to Starbucks' logo and appears in 30 branches in Addis Ababa alone.<sup>859</sup> The American fast food chain In-N-Out Burger only learned about "its" popularity in Ethiopia once tourists complained to company headquarters about poor quality standards.<sup>860</sup>

Pharmaceuticals appear to be one of the most prominent types of counterfeit products sold in Ethiopia.<sup>861</sup> According to the Ethiopian Food and Drug Administration, 4.82 percent of the medicines distributed in the country did not meet appropriate specifications in 2015,<sup>862</sup> and this is likely attributable to counterfeits. The prevalence of this problem in Ethiopia has reached international awareness, as evidenced by recent reports by the World Health Organization (WHO).<sup>863</sup> WHO estimates that 10 percent of medications distributed to Ethiopia and other low- and middle-income countries could be counterfeits. Such products, they claim, have both immediate patient safety impacts and longer-term effects, given that counterfeits undermine trust in healthcare and discourage the use of the healthcare system.<sup>864</sup>

## Recent Changes in Ethiopia's Trademark Enforcement Measures

According to interviews with government officials and industry representatives in Ethiopia, the country has recently undertaken efforts to address trademark protection and enforcement concerns.<sup>865</sup> These have included a series of administrative, legal, domestic outreach, and international coordination reforms. Recent initiatives that were most commonly cited by interviewees were the creation and launch of an online trademark filing system; the upgrading of the number and competence of trademark examiners; new licensing and registration requirements for trademark agents; efforts by EIPO to conduct technical training across a wide spectrum of government officials, industry representatives, IPR

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<sup>857</sup> Industry representative and local IPR expert, interview by USITC staff, Addis Ababa, Ethiopia, September 30, 2019.

<sup>858</sup> Industry representative and local IPR expert, interview by USITC staff, Addis Ababa, Ethiopia, September 30 – October 2, 2019.

<sup>859</sup> Economist, "Turning Blockbusters into Booty: Ethiopia's Ingenious Video Pirates," July 6, 2017. See Kaldi's Coffee website (accessed November 11, 2019).

<sup>860</sup> Economist, "Turning Blockbusters into Booty: Ethiopia's Ingenious Video Pirates," July 6, 2017.

<sup>861</sup> Lince, "Counterfeit Hotspots in Ethiopia," October 17, 2019.

<sup>862</sup> Yohannes, "Ethiopia: Trademark Protecting Businesses," April 17, 2019; *Ethiopian Herald*, "Raising Guard On Substandard, Counterfeit Drugs," April 17, 2018.

<sup>863</sup> WHO, "Strengthening Pharmaceutical Systems and Improving Access to Quality Medicines," 2016.

<sup>864</sup> WHO, "Strengthening Pharmaceutical Systems and Improving Access to Quality Medicines," 2016.

<sup>865</sup> Government officials and industry representatives, interview by USITC staff, Addis Ababa, Ethiopia, October 4–7, 2019.

experts, and the general public;<sup>866</sup> and EIPO officials' increased access to technical training from such institutions as WIPO, the U.S. Patent and Trademark Office (USPTO), and the European Patent Office. There has even been speculation that Ethiopia will establish a specialized IP court soon, though substantive progress on that initiative is not yet apparent.<sup>867</sup>

EIPO launched a new online trademark filing system in December of 2018, in collaboration with WIPO. The motivation behind this was to end EIPO's dependency on substantially outdated paper systems; circumvent unnecessary administrative procedures, including lengthy discussions with EIPO staff; and, most importantly, expedite the trademark application system and review period.<sup>868</sup> While the online system only facilitates the filing process for trademark registration (as applicants still need to eventually present the same documentation in person at the EIPO Registry), observers state that "it is nonetheless expected to improve the efficiency of the registration process, which is important to businesses."<sup>869</sup> The development of digital filing has been welcomed by both domestic and international rights holders.<sup>870</sup>

In addition, EIPO also added new licensing and registration requirements for trademark agents; the requirements are thought to serve as a certification system of sorts. It is anticipated that dealing with better-trained agents may enable trademark filers to more effectively manage their IP rights.<sup>871</sup> For more details on recent trademark enforcement reforms in Ethiopia, see tables E.3 and E.4 in appendix E.

Despite a tight budget and lack of facilities, EIPO has also recently more than doubled the number of trademark examiners (from 5 to 12) and increased their internal technical training. In the past, the paucity of examiners had substantially contributed to a growing backlog of trademark applications. The recently hired examiners also include more so-called "substantive examiners," who delve into legal issues typically not undertaken by the "formality examiners" who check for basic eligibility, form, and content.<sup>872</sup> In addition, EIPO has started to hire more examiners with graduate school education, and has increased its training initiatives for staff and other EIPO stakeholders.<sup>873</sup> In recent years, EIPO has also received an extensive amount of technical assistance from WIPO, USPTO, the European Patent Office, and institutions such as the International Trademark Association.<sup>874</sup>

According to EIPO and WIPO, EIPO has made considerable efforts to raise awareness of IP issues across a broad range of audiences—to the point where awareness raising has become part of EIPO staff's daily work.<sup>875</sup> The primary targets have been law enforcement officials (as they are the first responders to

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<sup>866</sup> Although public outreach and training was a frequently cited reform effort, some company and industry association representatives were unaware of technical training offerings.

<sup>867</sup> Government officials, industry representatives, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, October 4–7, 2019.

<sup>868</sup> Government of Ethiopia, Intellectual Property Office, "Office Launches Online Trademark Filing System," December 21, 2018.

<sup>869</sup> Adams and Adams, "Ethiopia Has Introduced an Online Trade Mark Filing System" (accessed January 9, 2020).

<sup>870</sup> World Trademark Review, "Ethiopian IPO Opens Pilot for Online Filing" (accessed January 9, 2020).

<sup>871</sup> Private sector representative, interview by USITC staff, Addis Ababa, Ethiopia, January 4, 2020.

<sup>872</sup> EIPO, "The Ethiopian IP System," October 2019.

<sup>873</sup> EIPO, "The Ethiopian IP System," October 2019.

<sup>874</sup> WIPO, "Technical Assistance Database" (accessed January 8, 2020).

<sup>875</sup> WIPO, Advisory Committee on Enforcement (Twelfth Session), "Awareness Building and Strategic Campaigns," June 29, 2017.

allegations of IP infringement), who generally lack specialized knowledge and often rely on EIPO for expert opinions.<sup>876</sup> In addition to technical training through a growing number of workshops, EIPO is working with WIPO to establish a “Start-Up IP Academy” as a means of better institutionalizing the training. Another target audience has been faculty and students at educational institutions, often in the form of workshops, exhibitions, and technical training on forming IP policies.<sup>877</sup> Even private firms and the media have been part of EIPO’s outreach efforts, which seek to reach both general-interest audiences and specialized ones (e.g., those in Ethiopia’s vital coffee sector). EIPO has even entered contractual relationships with newspapers to help educate the public at large about IP issues, and offers them the option of interviewing officials.<sup>878</sup> Notwithstanding, many members of the business community, particularly those who run small companies, do not know of these outreach efforts.<sup>879</sup>

Finally, Ethiopia has made plans to create a new tribunal that specializes in trademarks, copyrights, and patent cases.<sup>880</sup> Currently, IP cases are arbitrated by a committee headed by the EIPO director and by the Federal High Court, which practitioners have criticized for a lack of knowledge and misapplication of the law.<sup>881</sup> If created, it appears the specialized tribunal system would replace the functions of the EIPO committee, would have their own specialized courts within EIPO, and would allow for appeal.<sup>882</sup>

## Impact of Ethiopia’s Trademark Reforms on Trade and Investment

Ethiopia’s economy has been growing very rapidly. According to the International Monetary Fund, Ethiopia’s annual real GDP grew by 9.3 percent on average from 2014 to 2018.<sup>883</sup> This is higher than any other SSA country, and three times faster than the average annual growth of 3.1 percent for the SSA region over the same period. Ethiopia also stands out with regard to investment; it has been one of SSA’s largest recipients of FDI since 2017.<sup>884</sup> While Ethiopia’s government does not publish FDI data by country source, fDi Markets’ transaction-level data suggest that, when aggregated, FDI inflows from the United States have been on the rise, mainly in the oil, beverages, and healthcare industries.<sup>885</sup>

Growth in Ethiopia’s worldwide merchandise trade flows has been considerably more modest and erratic; Ethiopia’s export and import growth averaged 0.4 percent and 3.8 percent, respectively, during

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<sup>876</sup> WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>877</sup> WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>878</sup> WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>879</sup> Industry representative and local IPR expert, interview by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019; WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns,” June 29, 2017.

<sup>880</sup> Ezega News, “Ethiopian IP Office to Establish Courts,” April 19, 2017.

<sup>881</sup> Adams and Adams, “Trade Marks in Ethiopia: What You Need to Know,” July 4, 2018.

<sup>882</sup> Ezega News, “Ethiopian IP Office to Establish Courts,” April 19, 2017.

<sup>883</sup> IMF, World Economic Outlook database, “Gross domestic product, constant prices” (accessed September 2019).

<sup>884</sup> Deloitte, “Invest in Ethiopia: Structural Reforms Set,” June 2019.

<sup>885</sup> fDi Markets Database (accessed October 22, 2019).

2014–18. However, bilateral trade between the United States and Ethiopia has been more robust: Ethiopian merchandise exports to the United States and imports from the United States grew at an average growth rate of 21.8 percent and 28.8 percent, respectively, during the same period. According to Ethiopian statistics, the United States is Ethiopia’s second-largest trade partner behind China.<sup>886</sup>

The Commission’s research found no evidence pointing to the recent growth in Ethiopia’s GDP, FDI, or trade flows as resulting from the recent trademark protection and enforcement reforms described above. However, that does not necessarily mean that those trademark reforms had no effects. It simply suggests that it may take time and sustained efforts for such reforms to show an overall effect on the Ethiopian economy. Empirical evidence has shown that enhanced trademark protection in developing countries, including Ethiopia and the SSA, ultimately supports economic growth. IP expert Keith Maskus explains that for foreign firms, better trademark protection expands incentives for trade and FDI, and improves access to products for consumers.<sup>887</sup> Two other researchers, Walter Park and Douglas Lippoldt, find that improved trademark protection in developing countries reassures investors that trademark infringement can be managed.<sup>888</sup>

Some tangible impacts appear to have resulted from Ethiopia’s trademark reforms. First, according to EIPO, trademark application filings for both domestic and foreign firms have grown quickly in recent years. The 11,304 trademark applications that have been filed in a recent five-year period (2014–18), for example, are two and a half times greater than the number of trademark applications filed in the prior five-year period (2009–13).<sup>889</sup> This suggests that firms may be more aware of the necessity and usefulness of filing for trademark protection, as well as how to go about doing so. Moreover, empirical studies have found that branding is one of the most important mechanisms for firms to generate returns on investment.<sup>890</sup>

Second, as of 2017, the number of domestic trademark applicants surpassed that of foreign applicants for the first time.<sup>891</sup> This suggests greater confidence in the trademark system among domestic applicants. Third, a much larger share of domestic applicants is getting trademarks registered. In the 2014–18 period, for example, 42.6 percent of domestic applicants had their trademarks granted, versus only 5.6 percent in the 2009–13 period.<sup>892</sup> As review standards have not changed, this suggests an improvement in either the quality of the applications, the effectiveness of the trademark review process, or a combination of the two. These efforts can play a role in improving the domestic trade and investment climate.

Although Ethiopia’s *Ease of Doing Business* ranking was 159 out of 190 countries analyzed by the World Bank in 2018, Ethiopia has been among the economies whose business environment has improved in

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<sup>886</sup> IHS Markit, *Global Trade Atlas* (accessed January 8, 2020).

<sup>887</sup> Maskus, *Intellectual Property Rights in the Global Economy*, 2000.

<sup>888</sup> Park and Lippoldt, “Technology Transfer and the Economic Implications,” 2007.

<sup>889</sup> EIPO, “The Ethiopian IP System,” October 2019. Appendix table E.1 lists trademark applications and grants by domestic and foreign filers in both Ethiopia and Kenya.

<sup>890</sup> WIPO, *World Intellectual Property Report*, 2013.

<sup>891</sup> EIPO, “The Ethiopian IP System,” October 2019.

<sup>892</sup> Given the lag between application and grant times for trademarks, these could slightly overestimate or underestimate actual grant rates.

recent years.<sup>893</sup> Regulatory reforms, improvements to its trademark laws and enforcement mechanisms, the Prime Minister’s efforts to accede to the WTO, the extension of the African Growth and Opportunity Act (which provides U.S. firms with tariff- and duty-free incentives to invest) to 2025, and increased coordination with other branches of government have all played a part in improving business conditions.<sup>894</sup> Interviewed government officials have identified broad connections between better trademark protection and increased FDI, noting that the IPR reforms have created a more predictable business environment.<sup>895</sup> The International Trademark Association came to similar conclusions, and added that trademark reform in Ethiopia has also led to local product development, especially for small and medium-sized businesses.<sup>896</sup> These views suggest that more significant trade and investment flows could come to Ethiopia with sustained reforms of its trademark reform and enforcement mechanisms.

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<sup>893</sup> World Bank, *Doing Business 2019: Training for Reform*, 2019.

<sup>894</sup> USDOC, “Ethiopia: Market Overview,” October 2019; World Bank, *Doing Business 2019: Training for Reform*, 2019.

<sup>895</sup> Government officials, interview by USITC staff, Addis Ababa, Ethiopia, September 30–October 2, 2019.

<sup>896</sup> Government officials, industry representatives, and local IPR experts, interviews by USITC staff, Addis Ababa, Ethiopia, October 2, 2019.



# Chapter 6

## Agricultural Innovations in SSA

### Introduction

This chapter examines the adoption of certain agricultural innovations<sup>897</sup> in SSA countries.<sup>898</sup> It presents examples of the recent adoption of these innovations by SSA countries, identifies factors driving these developments, and examines ways that these innovations affect the output and export performance of agricultural producers in SSA.

The first part of this chapter presents an overview of the current state of agricultural innovation in SSA. The overview provides context and background information needed for a broad view of agriculture in SSA as a region. It also looks at various macroeconomic and demographic developments surrounding the sector and presents agricultural production trends and data. The section then introduces various types of agricultural innovations, as well as key factors that affect their adoption in the SSA context.

The second part of this chapter presents three case studies giving examples of agricultural innovations that have been adopted in certain SSA countries and that are having an impact, or are expected to have an impact, on production and exports in these countries. The first case study looks at biotechnology adoption in Nigeria, which is expected to increase cotton yields in the country, potentially boosting production and exports, while also potentially revitalizing the domestic textile industry. The second case study discusses the pilot-level application of blockchain technology to the cocoa supply chain in Côte d'Ivoire, which increases transparency and may enable farmers to obtain high price premiums as well as creating incentives for increased production. The third case study describes the introduction of an index-based crop insurance product in Kenya, which has the potential to raise farm income and investment, improve productivity and yields, and increase the reliability of supply.

### Key Findings

Overall adoption of modern agricultural innovations in SSA is still low, and many hurdles exist to increasing adoption rates.<sup>899</sup> The differences among the SSA countries—including the level of economic development, governmental regulations, market conditions, farm economy characteristics, and agronomic conditions—add to the complexity of analyzing the adoption of new technologies. In general,

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<sup>897</sup> Agricultural innovations are novel approaches to performing tasks and creating new products and new procedures in agriculture. The benefits of these innovations to agricultural producers and consumers can include higher yields, lower costs, safer growing conditions, and safer foods. The impact from innovations may differ by crop and country. Agricultural innovation is also referred to as “agtech” and “agrifood tech.” Sunding and Zilberman, “The Agricultural Innovation Process,” 2001, 48; NIFA, “Agriculture Technology” (accessed January 23, 2020).

<sup>898</sup> Sub-Saharan Africa refers to the 49 countries listed in 19 U.S.C. § 3706, including South Sudan, which was added in 2012.

<sup>899</sup> Bold, “Sub-standard Quality of Fertilisers,” December 5, 2015.

the large number of smallholders<sup>900</sup> and the fragmented production practices in most SSA countries limit consolidation enabling scaled-up operations, where most innovations would be the most beneficial. Additionally, national regulations and regional policies continue to be a challenge for agricultural innovation adoption—particularly in biotechnology, as discussed in the first case study of this chapter.

On the other hand, consumer demand increasingly drives the adoption of agricultural innovations, such as blockchain for supply chain traceability, as presented in the second case study of this chapter. Other factors also help increase adoption of agricultural innovations in SSA. For example, continued outreach efforts seek to educate farmers about the benefits of innovations. Advances in digital and mobile payments systems enable smallholders to participate in financial activities, such as access to credit needed to adopt innovations. Moreover, product development is being targeted to better fit local needs, as seen in the third case study on index-based crop insurance.

While the specific roles and effects differ by case, the agricultural innovations reviewed in this chapter are all expected to raise agricultural production and export potential by improving the competitiveness of agricultural products. This is achieved by reducing costs, differentiating products, and improving the reliability of supply.<sup>901</sup> Table 6.1 lists the key findings from each case study in this chapter.

However, inconsistent regulations across the region and a lack of digital and agricultural infrastructure, such as irrigation and transportation networks, are barriers that could limit the long-term, sustainable improvements in production that these agricultural innovations can provide. Rapidly growing domestic populations and food demand could also limit agricultural exports from SSA.

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<sup>900</sup> Smallholders are producers on commercial small farms selling 50 percent or more of their production, using 2 hectares or less of land (slightly less than 5 acres). AGRA, *Africa Agriculture Status Report 2017*, 2017; ISAA, “Brief 53: Global Status of Commercialized Biotech/GM Crops: 2017,” 2018.

<sup>901</sup> Competitive factors for agricultural products can be evaluated through the lens of these three aspects of production. USITC, *China’s Agricultural Trade*, 2011, 127.

**Table 6.1** Key findings of case studies on adoption of agricultural innovations in SSA

Technological innovation	Country of focus	Crop/market	How adoption affects production and export performance	Regulatory policies and market conditions that affect the sector
Biotechnology	Nigeria	Cotton seeds genetically engineered to carry the <i>Bacillus thuringiensis</i> gene <sup>a</sup>	Improved yield from genetically engineered seeds may lead to increased production. Growth in exports of cotton may be impacted by the domestic textile industry's capacity to absorb increased production of the fiber.	Government regulation of commercial use of biotechnology hinders adoption for many countries, but regional efforts to revive textile industry led to adoption by Nigeria.
Blockchain for supply chain transparency	Côte d'Ivoire	Cocoa for chocolate production	Price and time savings from adopting blockchain <sup>b</sup> reduces costs of certifying products as compliant with labor and sustainability standards and improves reliability of supply. Exports may grow, as demand for certified products continues to be strong.	Consumer demand for certified cocoa products drives adoption to improve the supply chain auditing process; high implementation cost could limit further adoption. Government policies do not play a major role in adoption.
Crop insurance	Kenya	Staple grains produced by smallholders	Adoption of index-based crop insurance protects farmers from risk of crop loss, improving reliability of supply, and may positively affect production and exports.	Mobile phone penetration, lower price levels of new insurance products, and volatile global commodity markets increase adoption.

Source: Compiled by USITC.

<sup>a</sup> The *Bacillus thuringiensis* gene protects the cotton crop from pests, particularly the cotton bollworm.

<sup>b</sup> Blockchain is an immutable distributed digital ledger made up of blocks of data that are verified by user consensus rather than being maintained by a central authority.

## Overview of Sub-Saharan African Agriculture

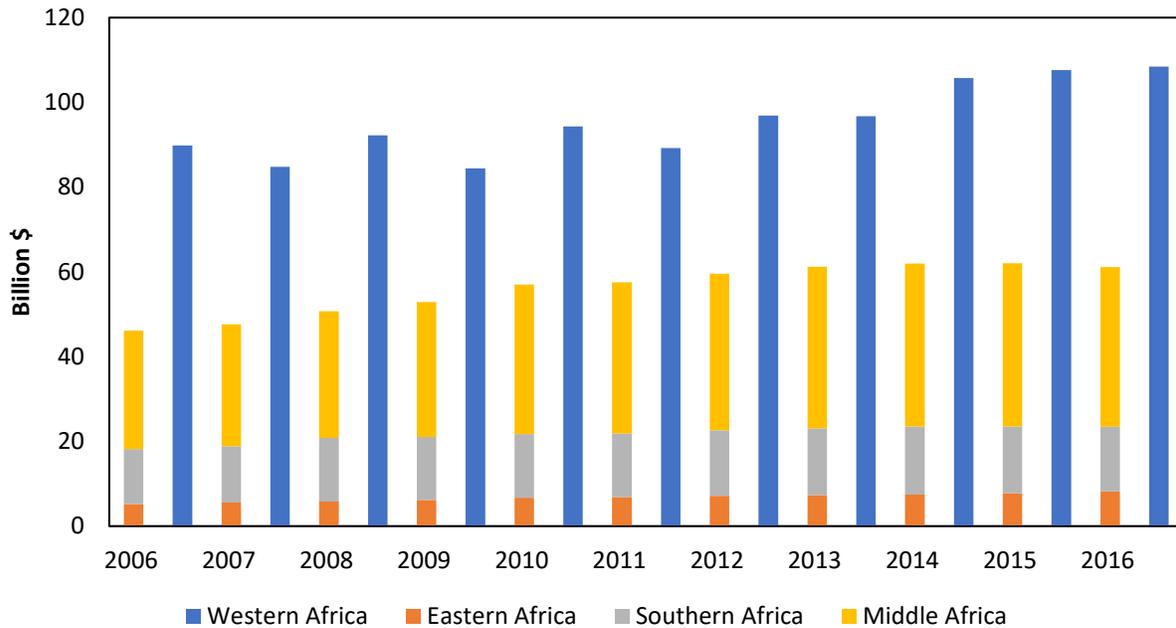
Agricultural production in SSA continues to grow at a strong pace, despite recent droughts depressing crop output. From 1990 to 2016, the total value of production more than doubled (243 percent), with an average compound annual growth rate of 3.5 percent over 26 years.<sup>902</sup> Among subregions, western Africa is the largest agricultural producer in SSA, accounting for 64 percent of total agricultural value, followed by eastern Africa, which accounts for 22 percent.<sup>903</sup> The imbalance of agricultural value by

<sup>902</sup> Not all SSA countries are accounted for, due to data limitations. The growth rates are based on a 26-year average compound annual growth rate from 1990 to 2016 for 29 countries for which statistics are available in the FAOSTAT database of the Food and Agriculture Organization of the United Nations (FAO). The most recent year available for value of agricultural production in FAOSTAT is 2016. In comparison, North America, Western Europe, and Asia have grown at an annual rate of 1.4 percent, 0.1 percent, and 2.9 percent respectively over the same 26-year period. FAO, FAOSTAT Statistical Database (accessed November 27, 2019).

<sup>903</sup> Using FAO's definitions, western Africa includes Benin, Burkina Faso, Côte d'Ivoire, Cabo Verde, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo, as well as the territories of Saint Helena, Ascension, and Tristan da Cunha. Eastern Africa includes Burundi, Comoros,

region, as shown in figure 6.1, comes from widely varying growing conditions, which lead to different key crops for each region.<sup>904</sup> Production of cotton, cocoa, and maize (corn)—three commodities covered in the case studies—in SSA had also increased in recent years (figure 6.2). Both maize and cocoa production has been growing at a steady pace across SSA.

**Figure 6.1** Agricultural output value by region, 2014–16, billion dollars

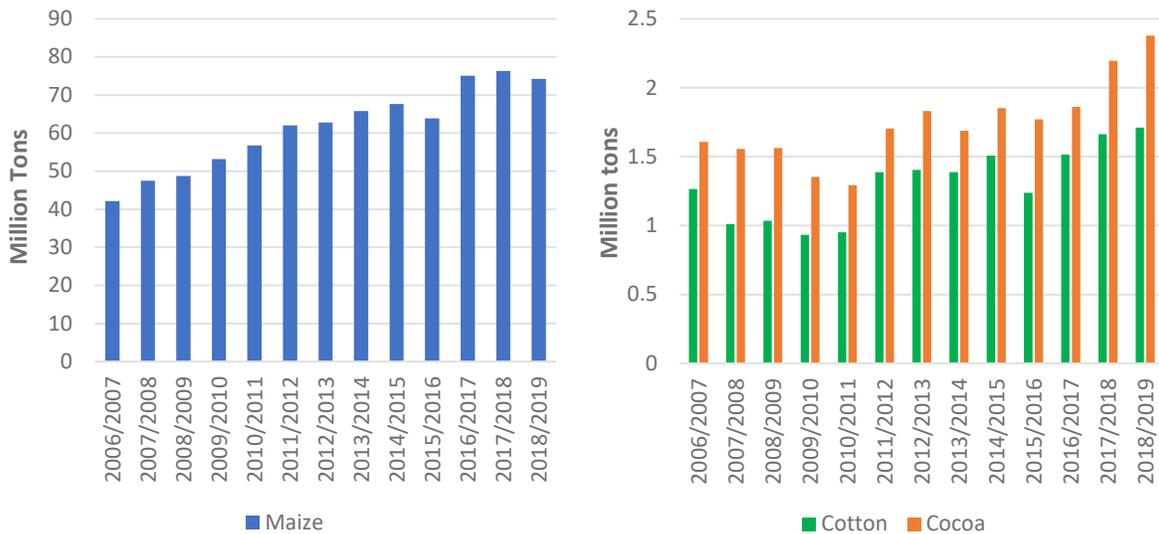


Source: FAO, FAOSTAT Statistical Database (accessed November 27, 2019).

Note: Agricultural output is defined as the agriculture production index number calculated by FAO. Detailed information on the calculation methodology can be found at [http://fenixservices.fao.org/faostat/static/documents/QI/QI\\_e.pdf](http://fenixservices.fao.org/faostat/static/documents/QI/QI_e.pdf). See appendix table I.5 for a tabular presentation of the data in this figure.

Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, Somalia, South Sudan, Uganda, Tanzania, Zambia, and Zimbabwe, as well as Mayotte and Réunion (which are departments of France). These definitions do not necessarily match those of 19 U.S.C. § 3706 and are used for statistical purposes only. Agricultural output is denoted by the production index number for agriculture, in constant U.S. dollars (2004–06). FAO, FAOSTAT Statistical Database (accessed November 27, 2019).

<sup>904</sup> For instance, the top item in terms of production value in West Africa is yams, which are not produced much in other SSA regions. Cereals and cassava (manioc) are produced across SSA. FAO, FAOSTAT Statistical Database (accessed December 19, 2019).

**Figure 6.2** SSA production<sup>a</sup> trends for selected crops, marketing years 2006/2007–2018/19

Source: FAO, “FAOSTAT Statistical Database” (accessed November 27, 2019).

Note: See appendix table I.6 for a tabular presentation of the data in this figure.

<sup>a</sup> Production statistics for cotton and maize are based on 2018/19 marketing year estimates from the Production, Supply, and Distribution (PSD) database, Foreign Agricultural Service, USDA. Cocoa production is an estimate based on mirrored export statistics of Ghana and Côte d’Ivoire. IHS Markit, Global Trade Atlas database (accessed November 26, 2019).

## Impact of Demographic Changes on Agricultural Production in SSA

Based on population and per capita income growth forecasts, expectations for continued agricultural consumption in SSA are strong.<sup>905</sup> In 2016, the total SSA population was estimated to be 950 million, and based on projections of a strong fertility rate, the number of people under 25 is forecast to double by 2050.<sup>906</sup> With a larger and richer population, overall demand for food is expected to grow accordingly, likely raising food prices across SSA. Affecting both the urban and rural population, this growth is predicted to spur more agricultural demand from the cities and boost employment opportunities in rural areas. Together, these trends should create additional incentives and expectations for increased investment in SSA agriculture.<sup>907</sup>

<sup>905</sup> OECD and FAO, *OECD-FAO Agricultural Outlook 2016–2025*, 2016.

<sup>906</sup> AGRA, *Africa Agriculture Status Report 2019*, 2019.

<sup>907</sup> Approximately 40 percent of rural employment time is in self-employed farming. Many rural Africans work only part time in agriculture, and many work most of their time in non-farm employment. Midstream and downstream agricultural industries also created 25 percent of rural employment, increasing off-farm income opportunities. AGRA, *Africa Agriculture Status Report 2019*, 2019. Per capita incomes in SSA are forecast to grow 14.2 percent by 2028, led by Ethiopia. OECD and FAO, *OECD-FAO Agricultural Outlook 2019–2028*, 2019.

## Challenges Facing SSA Agriculture

One of the biggest obstacles to increasing agricultural production in SSA is the lack of overall agricultural productivity growth.<sup>908</sup> Recent growth in output has come from increasing the acreage under cultivation, not from yield improvements.<sup>909</sup> A key reason for this lack of productivity growth in the agricultural sector, which has been stagnant since the 1980s, is the prevalence of smallholders.<sup>910</sup> In Africa, most farmers, who account for approximately 70 percent of the population, are smallholders using 2 hectares of land.<sup>911</sup> Moreover, though Africa's agricultural sector employs around 65 percent of its labor force, it accounts for only slightly over 30 percent of the continent's GDP.<sup>912</sup>

As most smallholders have low incomes and maintain a rudimentary approach to farming, relatively simple technologies such as tractor use, cold-chain technology,<sup>913</sup> and modern irrigation systems could significantly improve yields. However, this would require substantial investment from low-income farmers.<sup>914</sup> While there is a growing "middle class" of farmers in SSA with somewhat larger holdings, its emergence is a result of investments from urban upper-class investors rather than from a consolidation of smallholder farms.<sup>915</sup> Furthermore, it is unclear that these middle-class farms are more productive per hectare, despite the increase in farm size.<sup>916</sup>

Other challenges surround SSA agriculture as well. The food supply at both the national and local levels is growing, but population is also growing, and countries may still experience food shortages.<sup>917</sup> Poverty levels in SSA are still very high, and will remain so due to growing income inequality, despite economic growth.<sup>918</sup> Furthermore, the lack of infrastructure—including transportation networks, energy access, and storage facilities—results in higher production costs for cereals.<sup>919</sup> The abundance of price-competitive imports increases SSA countries' dependence on food from abroad, which in turn limits investment in SSA's agricultural sector. Finally, increasing pressure from pests and diseases stemming

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<sup>908</sup> In recent years, agricultural production growth has failed to keep pace with demand, resulting in increased imports of wheat, rice, and poultry. Strong skepticism about agricultural production growth exists as well, with some experts noting that there has not been any "green revolution" despite heavy agricultural investment and the digital revolution. Industry representative, interview by USITC staff, Accra, Ghana, September 5, 2019.

<sup>909</sup> OECD and FAO, *OECD-FAO Agricultural Outlook 2016–2025*, 2016.

<sup>910</sup> Approximately 85 percent of Africa's agricultural output comes from smallholders. AGRA, *Africa Agriculture Status Report 2017*, 2017; AGRA, *Africa Agriculture Status Report 2018*, 2018. Despite an abundance of agricultural acreage in SSA, consolidation of agricultural land to increase the economies of scale is unlikely, because agricultural land mostly belongs to smallholders. OECD and FAO, *OECD-FAO Agricultural Outlook 2016–2025*, 2016.

<sup>911</sup> ISAAA, *Brief 53: Global Status of Commercialized Biotech/GM Crops: 2017*, 2018. Two hectares equal slightly less than 5 acres of land.

<sup>912</sup> ISAAA, *Brief 53: Global Status of Commercialized Biotech/GM Crops: 2017*, 2018.

<sup>913</sup> Cold-chain technology refers to all equipment along the supply chain that keeps a product within a low temperature range to preserve and extend shelf life.

<sup>914</sup> McKinsey & Company, "Winning in Africa's Agricultural Market", 2019.

<sup>915</sup> The authors define "mid-scale" farmers as producers with 5–100 hectares of land. Muyanga et al., "The Rise of Medium-Scale Farms in Africa," December 3, 2017, 23.

<sup>916</sup> Muyanga et al., "The Rise of Medium-Scale Farms in Africa," December 3, 2017, 23.

<sup>917</sup> OECD and FAO, *OECD-FAO Agricultural Outlook 2016–2025*, 2016.

<sup>918</sup> Bhorat, "Inequality in Africa," *Brookings* (blog), September 22, 2015.

<sup>919</sup> OECD and FAO, *OECD-FAO Agricultural Outlook 2016–2025*, 2016.

from changing climate patterns poses a risk to agricultural production, making it still harder to increase investment in the sector.<sup>920</sup>

## Agricultural Innovations in SSA

Recently, governments, stakeholders, and investors in SSA have been increasingly eyeing agricultural innovations that provide a “leapfrogging” solution to these challenges,<sup>921</sup> boosted by the success of mobile and internet penetration in the region.<sup>922</sup> The following section presents a framework for examining these technologies.

Agricultural innovations encompass a broad range of technologies, and affect different stages of the agricultural production process, resulting in widely varying effects.<sup>923</sup> While these technologies may lead to innovations throughout the value chain, this chapter focuses on agricultural innovations that directly affect production and output, up to the pre-processing stages of food production.<sup>924</sup>

Globally, the pace of agricultural technology development has grown in recent years, due in part to strong investment coupled with the rapid digitization of data and the proliferation of technologies relying on the Internet of Things. This has increased the variety of technologies and the number of suppliers of various applications used in agriculture.<sup>925</sup> The majority of such agricultural innovations are developed by venture capital-funded startups that mostly reside in the United States and Europe. In SSA, South Africa has the largest number of agricultural innovation startups, but other startups exist in Kenya and Nigeria as well.<sup>926</sup>

Despite rapid progress in the development of such technologies, their adoption is likely to be slower in SSA.<sup>927</sup> Farmers in SSA often have insufficient skills to take advantage of these innovations, lack the resources to invest in them, or have misleading perceptions about them.<sup>928</sup> Lack of investment in digital infrastructure also hinders further adoption of these technologies through limited connectivity, content, and capacity.<sup>929</sup>

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<sup>920</sup> Accumulated damage estimates in SSA from fall armyworm, a key pest that mainly targets maize, range from \$1 billion to \$3 billion. OECD and FAO, *OECD-FAO Agricultural Outlook 2019–2028*, July 2019.

<sup>921</sup> Kah, “Africa Is Leapfrogging into Digital Agriculture” (accessed November 12, 2019).

<sup>922</sup> A 2019 article shows that among venture-funded startups in agriculture during 1981–2019, input technologies and services were by far the largest portion (2482 out of 4552, 55%). Within that subcategory, software/data (942), devices/sensors (430), and biotech/genetics/health (918) lead the way. Silva, Graff, and Zilberman, “Venture Capital and the Transformation of Private R&D,” 2019.

<sup>923</sup> While often employed interchangeably in colloquial use, the terms “innovation” and “technology” are not synonyms. Innovation does not require technology, and simply may be a divergence from existing products or experiences. UNHCR Innovation, “Why Innovation and Technology Aren’t the Same,” March 13, 2017.

<sup>924</sup> AgTech Insight, *AgTech Market Map*, 2016.

<sup>925</sup> AgFunder, *AgFunder AgriFood Tech Investing Report*, 2019, 67.

<sup>926</sup> Silva, Graff, and Zilberman, “Venture Capital and the Transformation,” 2019.

<sup>927</sup> The adoption rates of innovation are commonly believed to have an S- or a J-curved path, where adoption initially takes some time before rapid expansion. Rogers, *Diffusion of Innovations*, 1983, 15.

<sup>928</sup> Pierpaoli et al., “Drivers of Precision Agriculture Technologies Adoption,” 2013.

<sup>929</sup> AGRA, *Africa Agriculture Status Report 2019*, 2019, 127.

## Types of Agricultural Innovations

This section presents several categories of agricultural innovations and their application in SSA, as well as the key factors that have driven implementation and adoption of these innovations. The discussion points to the effects these could have on agricultural production and exports of agricultural products in SSA. The categories group agricultural innovations by form or application to facilitate understanding of the scientific advancements and economic conditions shaping each category. However, these innovations vary by target area. Figure 6.3 shows a non-exhaustive list of agricultural innovations by target area across the value chain, from crop planning to post-harvest processing.<sup>930</sup>

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<sup>930</sup> Recent technologies, such as precision agriculture, combine multiple groups of technologies and affect multiple stages of the production process.

**Figure 6.3** Agricultural Innovations by key target areas

Category/stages of production	Planning	Planting	Growing	Harvesting	Processing
Biotechnology seeds, genetics	Seed/genetics				Food safety
Chemicals and fertilizers		Fertilizer			Preservation
		Plant protection			Pesticides
Machinery and equipment		Irrigation		Harvesting	Food processing
		Spraying			
		Planting		Monitoring	
Digital information, data processing and analytics	Data management/optimization				
	Market information				
	Weather forecasts				
	Traceability				
Risk management	Insurance	Marketing/Commodity exchange			

Source: Compiled by USITC.

## Biotechnology Seed

Biotechnology (“biotech”) seeds primarily affect the yield of the planted crop. Biotech seeds are engineered to have desirable traits that satisfy the needs of the farmer, such as reduced pest damage, fortified products, or resistance to pesticides. Biotech seeds generally increase yields,<sup>931</sup> and further adoption of these innovations would bolster the production of crops and potentially increase agricultural exports as well.

Until recently, the rate of adoption of biotech seeds in SSA has been very low, with the exception of South Africa.<sup>932</sup> Government policies that do not allow commercial use of genetically modified organism (GMO) seeds for production have limited widespread adoption of biotech seeds. Moreover, these policies have led to a strong reliance in the region on hybrid seeds that have higher production costs.<sup>933</sup> Recently, however, some SSA countries—including Kenya, Nigeria, Ethiopia, and Rwanda—have approved the use of biotech seeds.<sup>934</sup> In these countries, these seeds are usually approved for staple crops such as maize and cotton.<sup>935</sup> Further discussion on the adoption of biotechnology seeds in SSA is presented in the case study 6.1 in this chapter.

<sup>931</sup> Both biotech seeds and fertilizers increase the average expectation (“mean”) of yield, or reduces the variance in yields, for a given crop and area. This means both types of technologies maximize output, while also increasing the reliability of supply.

<sup>932</sup> ISAAA, GM Approval Database (accessed July 8, 2019).

<sup>933</sup> Industry representative, telephone interview by USITC staff, October 17, 2019.

<sup>934</sup> ISAAA, GM Approval Database (accessed July 8, 2019).

<sup>935</sup> ISAAA, GM Approval Database (accessed July 8, 2019).

## Inorganic Fertilizer

Fertilizers provide supplemental nutrients to soil. They are crucial for agricultural production, as they enable plant growth and increase yield potentials in suboptimal soils. Fertilizers usually contain nutrients for plant growth, such as nitrogen, phosphorus, potassium, and sulfur. Inorganic fertilizers, in particular, supply a greater quantity of these nutrients due to their abundant supply and increasing affordability.<sup>936</sup> They often need multiple applications throughout the growing season, depending on the crop and conditions.<sup>937</sup> Subsidized fertilizer programs have shown success in increasing yield in countries such as Malawi and Zambia, but the long-term effectiveness of subsidies on production is still debated.<sup>938</sup> For this reason, a holistic approach—including research and development and extension programs on soil quality and infrastructure to support small-scale producers—is necessary for these technologies to have a positive impact on agricultural production.<sup>939</sup>

Adoption rates of fertilizer in SSA have been growing and are considered a key driver of global fertilizer demand.<sup>940</sup> Following the growth of private sector providers of fertilizer, local and international investment has played an important role in supporting increased adoption. For instance, in Kenya and Zambia, private retailer networks grew rapidly following government decisions to reduce its direct role in the sector. The growing availability reduced the distance farmers travel to acquire fertilizer and increased fertilizer usage.<sup>941</sup>

## Livestock Genetics

Advances in livestock genetics and nutrition can help farmers raise healthy, productive animals so as to increase yields of animal protein. Recently developed tools in livestock genetics help farmers understand precise genetic factors of livestock for more efficient and effective animal breeding. Breeds or genotypes that are adapted for the local environment are in strong demand.<sup>942</sup> However, development and adoption in SSA, with the exception of South Africa, is limited due to lack of infrastructure and support capacity (e.g., research and development) and information such as recorded pedigrees.<sup>943</sup>

## Machinery and Equipment

Use of modernized machinery and equipment (mechanization) primarily improves farm labor productivity, increasing yield prospects and lowering costs. Sustainable use of machinery and equipment

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<sup>936</sup> Roser et al, “Fertilizers”, Our World in Data, 2020.

<sup>937</sup> OSU Extension Service, “Here’s the Scoop on Chemical and Organic Fertilizers,” March 9, 2015.

<sup>938</sup> Ricker-Gilbert et al., “Estimating the Enduring Effects of Fertiliser Subsidies,” February 2017, 70–97.

<sup>939</sup> OECD/FAO, *OECD-FAO Agricultural Outlook 2016–2025*, 2016.

<sup>940</sup> The International Fertilizer Association recently stated that fertilizer demand in Africa increased 42 percent from 2015 to 2017. International Fertilizer Association, *Fertilizer Outlook 2019–2023*, June 13, 2019.

<sup>941</sup> Subsidy programs are also part of this transition. Ghana’s fertilizer voucher system and Nigeria’s Presidential Fertilizer Initiative are examples of public-private partnerships that have seen relative success as well.

<sup>942</sup> Marshall et al., “Livestock Genomics for Developing Countries,” April 24, 2019, 1.

<sup>943</sup> Pedigrees are crucial in livestock breeding and genetics, as the records of livestock ancestry provide information necessary for predicting progeny performance. NPLC, “The History of Pedigrees” (accessed January 23, 2020).

can also help households reduce the burden of labor shortages, withstand unexpected shocks, decrease the environmental footprint of agriculture, and achieve food security.<sup>944</sup> Increasing mechanization is a key objective for many SSA countries, but the ability to scale up and obtain economies of scale is a major challenge. Further discussion of recent examples of mechanization in key SSA markets appears later in the chapter.

Mechanization has been increasing in SSA in recent years, mostly due to wider availability of suppliers, better understanding of the benefits by farmers, and lower costs.<sup>945</sup> Rising mobile and internet penetration rates, along with increased access to finance, also drive higher adoption rates by providing farmers with access to digitally enabled financial services as well as more information on the benefits of mechanization (see box 6.2 later in this chapter). However, Africa lags behind the rest of the world with respect to mechanized agricultural systems, as the large number of smallholders and their fragmented plots of farmland limit their ability to scale up operations to the point where mechanization would be most effective and beneficial.

## Data Processing and Analytics

High-volume data processing and analytics, often referred to as “big data,” can turn various types of data into information useful for agricultural planning and decision making. Examples include precision agriculture,<sup>946</sup> optimization of spraying schedules for maximum plant protection, and even weather forecasting.<sup>947</sup> These technologies improve efficiency throughout the production process, reducing input costs while also lowering the inherent production risk for the farmer. Data processing and analytics may also help the smallholder producer to overcome the information barriers that larger farms do not face.

Big data is a relatively new concept in agriculture and in SSA as well. However, it is recognized as a very important pillar of the development and modernization of farming in SSA. Adoption of that technology will depend on a wide range of factors, such as availability of internet infrastructure, penetration of sensors to collect high-frequency data, and regulations surrounding data processing. Further discussion of this topic can be found in the second case study of this chapter, which discusses the use of blockchain technology in the cocoa value chain.

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<sup>944</sup> FAO, “Why Mechanization Is Important” (accessed November 11, 2019).

<sup>945</sup> Malabo Montpellier Panel, *Mechanized: Transforming Africa’s Agriculture Value Chains*, 2018.

<sup>946</sup> Precision agriculture refers to a farming practice that monitors and reacts to specific parts of the field, as opposed to using a conventional, one-fits-all approach. NIFA, “Precision, Geospatial and Sensor Technologies Programs” (accessed January 23, 2020).

<sup>947</sup> One industry report estimates the total addressable market for key technologies in precision agriculture will reach \$240b in the United States alone. The subcategories in this report are precision fertilizer application (\$65 billion, 18 percent yield improvement), precision planting (\$45 billion, 13 percent yield growth), compaction reduction (\$45 billion, 13 percent yield improvement), precision spraying (\$15 billion, 4 percent yield growth), precision irrigation (\$35 billion, 10 percent yield improvement), and field monitoring and data management (\$35 billion). Revich et al., “Precision Farming: Cheating Malthus with Digital Agriculture,” 2016.

## Risk Management and Digital Information Services

Risk management is a crucial part of the farming business, as key factors such as weather, yields, prices, government policies, and market conditions can create wide swings in farm revenue.<sup>948</sup> Risk management can be defined as the identification, evaluation, and prioritization of risks followed by efforts to minimize, monitor, and control the impact of these risks. The use of risk management processes and products not only helps the farmer reduce catastrophic costs from adverse events, but also increases the reliability of supply. Further discussion of this topic can be found in the third case study of this chapter, which discusses the use of a specific type of crop insurance.

Digital information services provide up-to-date information to assist farmers in making decisions that navigate these risks. Digital information services may range from simple weather notifications to specific production guidance for a subregion or commodity provided through personal devices. The adoption of these services has been growing in tandem with the adoption of mobile devices. While further adoption of digital information services may stall due to the challenges of smartphone adoption and access to internet connectivity, many of these have transformed themselves to satisfy local needs by providing region-specific weather data or offering their services in local languages to capture more customers.

## Selecting Case Studies: The Dynamics of Agricultural Innovation

Agricultural innovations have many dimensions, and there are multiple approaches that may lead to increases in adoption rates. Public and private investment in agriculture, a better-functioning financial sector, and improvements in overall economic indicators such as growth in per capita income are needed to better enable the adoption of agricultural innovations in SSA. Other significant factors are commodity market conditions, such as local crop prices, and technology market conditions, such as the end-user cost to adopt these innovations. In some cases, regional policies and domestic regulations also play an important role, as illustrated in the first case study, which covers biotech seeds. Changing preferences of end users driving value chain practices are another reason for adoption, as seen in the second case study, which describes a specific use of blockchain. Lastly, new designs for products that satisfy local needs also drive the adoption of agricultural innovations. This will be briefly discussed in the third case study, which addresses some promising insurance products.

These case studies highlight three key factors that affect the adoption of technologies: government policies, economic factors, and consumer preferences. First, government policies, including taxation, weak protection of intellectual property rights, and foreign currency limits, are often a strong barrier to companies wanting to enter a market. Second, economic factors, such as prices, can also depress adoption rates of certain technologies. This includes instances where technological solutions are not customized for SSA-specific regional needs, which can add costs or fail to provide enough benefits to potential users. Third, the adoption of certain technologies is sometimes driven by consumer demand, where changing end-user preferences and associated price premiums may motivate farmers to consider a new approach.

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<sup>948</sup> USDA, ERS, “Risk in Agriculture” (accessed November 11, 2018).

## Case Study 6.1: Commercialization of Biotechnology Cotton in Nigeria

### Summary

This case study focuses on the adoption of *Bacillus thuringiensis* (Bt) cotton in Nigeria, a biotechnology cotton variety that protects the crop from pests, particularly the cotton bollworm. Biotechnology allows the development of crop seeds that carry desirable traits that would otherwise not be present in the plants. The traits are introduced by inserting DNA segments from other organisms into the seed's DNA. It is one of the modern tools used in agriculture to ensure consistent production of crops, increase yields, prevent crop loss from pests and weather events, and reduce the application of chemicals, among other uses. In 2018, the Nigerian government allowed commercialization of Bt cotton, which is the first biotech crop to be approved for commercial production in the country. This shift in biotech policy may make it possible to achieve the goal of reviving the domestic textile industry in Nigeria—a high-priority government objective and a driver of Bt cotton adoption.

Though the adoption of Bt cotton is likely to increase output and quality of cotton production in Nigeria, some challenges, such as poor irrigation and limited access to Bt cottonseeds, might hinder this expansion. However, Nigeria is expected to be a leader in influencing the movement of SSA towards commercialization of biotech crops in the future.

### Technology

Biotech seeds, including Bt cotton, are developed to carry desirable traits that increase the reliability of supply of agricultural commodities as a result of higher crop yields, improved product quality, and reduced crop loss.<sup>949</sup> Biotechnology is one of a range of techniques applied to seeds that combine DNA segments of various organisms to create plant varieties with desirable characteristics, such as insect and herbicide resistance.<sup>950</sup> While traditional breeding techniques, including crossbreeding, result in high-quality hybrids that carry characteristics of each of the parent plants, biotechnology directly inserts traits into a seed that it otherwise would not have.<sup>951</sup> Seeds developed using biotech, along with other

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<sup>949</sup> Biotechnology is defined as the “application of the principles of engineering and biological science to create new products from raw materials of biological origin.” Verma, *Biotechnology in the Realm of History*, 2011, 321–323; UCD, CCR, “Benefits of Biotechnology,” June 28, 2017.

<sup>950</sup> Biotechnology has a wide range of applications for seed production and has been applied to multiple crops, such as soybeans, maize, and cotton. USDA, “Agricultural Biotechnology Glossary” (accessed November 12, 2019); SHI, “Herbert W. Boyer and Stanley N. Cohen,” December 1, 2017; USDA, ERS, “Recent Trends in GE Adoption,” September 18, 2019.

<sup>951</sup> Biology Online Dictionary, “Crossbreeding Definition” (accessed November 12, 2019). Genetic modification, genetic engineering, and genetic improvement are used interchangeably to refer to biotechnology techniques in which a gene from one organism's DNA—a plant, an animal, or a microorganism—that carries a specific characteristic is inserted into another organism's DNA. USAID, *Brief 1: What Is Agricultural Biotechnology?* 2004, 1; University of Illinois Extension, “Hybrids and Heirlooms,” 2001; Ralston, “Understanding Genetically Modified Foods,” August 23, 2016.

good agricultural practices, have the benefit of increasing crop yields and crop quality mostly by targeting some of the main problems that affect them: insects and weeds.<sup>952</sup>

Non-biotech cottonseeds, including hybrids, are susceptible to pests such as cotton bollworms, an insect that commonly attacks cotton fields and has devastating effects on cotton production. Cotton bollworm is the main pest affecting cotton in SSA, including in Nigeria, causing up to 60 percent yield loss when the fields become infested.<sup>953</sup> Biotech cottonseeds that have been engineered to carry the gene for *Bacillus thuringiensis*—a soil bacterium that paralyzes certain insects—have a built-in mechanism that conventional hybrids do not have. This mechanism protects cotton plants from becoming infested by cotton bollworm and other insects. The use of Bt lessens or eliminates the need for pesticides while reducing crop loss and increasing returns due to greater output and yields.<sup>954</sup> Bt cotton is the most common variety of biotech cotton used worldwide, having been first introduced in the United States in 1996; since then, Bt cotton has been approved for use in at least 26 countries.<sup>955</sup>

## Market

Cotton is one of the most important commodities in global agricultural trade.<sup>956</sup> West African countries,<sup>957</sup> including Nigeria, are the largest cotton producers in SSA, accounting for about 60 percent of total cotton production in the African continent. Although no individual SSA country is a large producer of cotton, as a region West Africa is the fifth-largest cotton producer in the world and the third-largest exporter globally.<sup>958</sup> Jointly, West African countries accounted for 12 percent of global exports in 2017.<sup>959</sup> Most West African cotton is exported, with only about 2 percent of the total production used domestically in the region.<sup>960</sup>

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<sup>952</sup> Purdue University, “Why Do We Use GMOs?” (accessed November 25, 2019).

<sup>953</sup> It is estimated that in Africa, cotton bollworm may cause up to 90 percent crop loss. IPBO, “Cotton in Africa” (accessed December 3, 2019); AgroPages, “Nigeria Launches New Varieties,” November 29, 2018; Isaac, “Nigeria Moves to Revive,” April 9, 2019.

<sup>954</sup> Additionally, Bt cotton has environmental benefits such as improving the conditions for beneficial organisms to grow. ISAAA, “Pocket K No. 6,” October 2018.

<sup>955</sup> ISAAA, *Brief 54: Global Status*, 2019, 35.

<sup>956</sup> After cotton seed is separated from harvested cotton, most cotton fiber is spun into yarn used in the production of textiles. Cotton fiber is also used in the paper industry, as well as for medical supplies, among other uses. Cottonseed is sold to farmers for planting or converted into cotton oil or animal feed. Finelib.com, “Cotton Producing States in Nigeria” (accessed November 12, 2019).

<sup>957</sup> The region of West Africa is defined here as including the Economic Community of West African States (ECOWAS) members—Benin, Burkina Faso, Cabo Verde, Côte d’Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo—as well as Cameroon, Mauritania, and Chad. OECD, “Cotton,” August 2006, 1.

<sup>958</sup> OECD, “Cotton,” August 2006, 1–6. In 2017, the top four cotton producers in SSA, by volume, were Burkina Faso (22 percent of SSA production by volume), Mali (15 percent), Benin (9 percent), and Côte d’Ivoire (9 percent). FAO, FAOSTAT Statistical Database (accessed September 27, 2019).

<sup>959</sup> Coulibaly, “The Progress of West African Cotton,” 2017.

<sup>960</sup> Exports from West Africa have been rising in recent decades, driven in part by high demand for cotton in Southeast Asian countries. These countries accounted for 90 percent of the region’s total exports in 2017, followed by the European Union (8 percent in 2017). Tièna, “The Progress of West African Cotton,” 2017.

Although cotton production in Nigeria has been decreasing, the country continues to be an important cotton producer in SSA, and cotton continues to be one of Nigeria’s most important agricultural sectors.<sup>961</sup> In 2008, Nigeria was still the second-largest cotton producer in SSA, accounting for about 12 percent of the total cotton output in the region. However, by 2017, it was the fifth-largest producer and accounted for only about 2 percent of the region’s output.<sup>962</sup> In Nigeria, in contrast to the rest of West Africa, the vast majority of cotton production is used domestically in the production of textiles, with only about 13 percent being exported in 2018.<sup>963</sup> Before 2018, all the cotton production in Nigeria was of conventional (i.e., non-biotech) cotton.

Despite strong governmental and regional pushes to increase cotton production in Nigeria, challenges for widespread growth in cotton output remain. Cotton production in Nigeria has declined since the 1980s, when it was one of the most prosperous industries in the country, due to a variety of factors, including reduced demand for the fiber driven by a decline in Nigeria’s textile sector.<sup>964</sup> Other reasons for the decline in cotton production in Nigeria include challenging agronomic conditions for growing cotton, such as limited access to high-quality seeds; increased pest pressure, particularly from the cotton bollworm; unfavorable climate conditions; inadequate irrigation (most of the cotton production in Nigeria is rainfed); and high input costs.<sup>965</sup> Poor access to credit for farmers, as well as limited research and development in agriculture, also affect farmers in Nigeria.<sup>966</sup> These challenges have contributed to reduced yields and profitability of the crop for cotton growers. If these challenges are not addressed, they could erode the potential benefits of adopting Bt cotton.

## Factors Driving Adoption

Government regulations are important factors for biotech seed adoption. Since the introduction of seed biotechnology in 1996, countries around the world have set up regulatory frameworks that allow research into new biotech seed varieties, as well as their development, testing, and commercialization.<sup>967</sup> SSA countries have not widely allowed commercial production of biotech crops

<sup>961</sup> Organic Cotton, “World Cotton Production” (accessed November 12, 2019); CTAP, “Country Profile: Nigeria” (accessed November 12, 2019).

<sup>962</sup> Harvest Choice, “Cotton” (accessed November 12, 2019).

<sup>963</sup> In 2018, Nigeria produced 235,000 480-pound bales of cotton and exported 30,000. USDA, FAS, PSD Online database (accessed November 6, 2019).

<sup>964</sup> Textiles had been one of the most important industries in the country, but three main factors led to its decline: a shift to petroleum production as the country’s principal economic activity; increased production costs for domestic cotton producers; and an influx of imports of lower-priced textiles, some contraband. At its peak, the sector represented about 60 percent of West Africa’s textile capacity. It also accounted for 15 percent of Nigeria’s manufacturing sector GDP and 25 percent of its employment. Fabamise, “Assessing Efforts to Revive Nigeria’s Textile Industry,” January 8, 2019; Malik, “Nigeria Seeks to Revive Cotton Industry,” May 20, 2019; de Coster, “Nigerian Textile Industry,” April 2018; Isaac, “Nigeria Moves to Revive,” April 9, 2019.

<sup>965</sup> Isaac, “Nigeria Moves to Revive,” April 9, 2019; CTAP, “Country Profile: Nigeria” (accessed November 12, 2019). The Nigerian cotton industry also faces constrained access to land, poor irrigation systems, and limited adoption of agricultural innovations, all of which reduce agricultural productivity and increase crop losses and waste. FAO, “Nigeria at a Glance” (accessed November 12, 2019).

<sup>966</sup> FAO, “Nigeria at a Glance” (accessed November 12, 2019).

<sup>967</sup> The global area planted that is dedicated to biotech crops has grown substantially since 1996, accounting for 191.7 million hectares in 2018. In 2018, the top 10 biotech-producing countries were, by area planted, the United

due to safety concerns and consumer non-acceptance of genetically modified organisms, although efforts towards developing a regulatory framework for enabling approval there have been significant.<sup>968</sup> In 1997, South Africa was the first SSA country to adopt the innovation (box 6.1).<sup>969</sup>

### **Box 6.1** Biotech Production in SSA

In 2018, four African countries—Sudan, South Africa, Eswatini (formerly Swaziland), and Nigeria—had commercial production of biotechnology (biotech) crops. Nigeria was the last of these to allow commercial production, which began in 2018. South Africa was an early adopter of biotech crops, allowing commercial production of Bt cotton for the first time in 1997—one year after the variety was introduced; it now ranks eighth worldwide in the production of biotech crops. South Africa has also approved commercial production of biotech maize, soybeans, cotton, canola, and rice, and is testing biotech potatoes, wheat, and sugarcane, as well as new biotech cotton varieties. Bt cotton adoption in South Africa has reached 100 percent, which means that only Bt cotton is used for commercial production in the country.

Source: ISAAA, *Brief 54: Global Status*, 2019, 10, 35–36.

More than two decades after South Africa allowed commercial biotech production, Nigeria allowed commercial production of Bt cotton for the first time.<sup>970</sup> In 2018, Nigeria approved the planting of two Bt cotton varieties, which were originally developed in India and adapted for the Nigerian market by the company Bayer/Mahyco Agriculture Nigeria Limited (Bayer/Mahyco) in collaboration with Nigerian researchers and government agencies.<sup>971</sup> Bayer/Mahyco initially distributed Bt cotton seeds free of

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States, Brazil, Argentina, Canada, India, Paraguay, China, Pakistan, South Africa, and Uruguay. Developing countries accounted for 54 percent of the total area planted in 2018 and have outperformed developed countries in terms of rate of growth since 2012. ISAAA, *Brief 54: Global Status*, 2019, 5.

<sup>968</sup> Opoku, “This Is How Nigeria Plans to Avoid,” October 4, 2019; Falck-Zepeda, Gruère, and Sithole-Niang, *Genetically Modified Crops in Africa*, 2013, 19.

<sup>969</sup> ISAAA, *Brief 54: Global Status*, 2019, 10.

<sup>970</sup> The Nigerian National Biosafety Management Agency is responsible for regulating biotechnology and must approve all uses of genetically modified organisms in the country. Government of Nigeria, National Biosafety Management Agency, “Function” (accessed February 28, 2020).

<sup>971</sup> The government of Nigeria approved commercial production of MRC 7377 BGII (MAHYCO C 567 BGII) and MRC 7361 BGII (MAHYCO C 571 BGII). Bayer/Mahyco is a joint venture between Bayer, a multinational corporation with operations in fields such as pharmaceutical, crop science, and animal health sectors, and Maharashtra Hybrid Seeds Company Private Limited (Mahyco Ltd.), an Indian seed company with operations in SSA, including in Nigeria, Kenya, and Burkina Faso. Mahyco website, <https://mahyco.com/meet-mahyco/>; Bayer website, <https://www.bayer.com/en/profile-and-organization.aspx>; ISAAA, “Nigeria Needs More Community Engagement,” July 10, 2019; USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019, 4. The Bt gene is applied to the germplasm of existing cotton varieties, resulting in a seed that carries Bt resistance and the remaining characteristics of the seed as determined by the local varieties into which the gene is inserted. Falck-Zepeda, Gruère, and Sithole-Niang, *Genetically Modified Crops in Africa*, 2013, 34.

charge to 1,000 Nigerian cotton farmers—a small fraction of the country’s total number—to evaluate the performance of the varieties in anticipation of their full commercial release for the 2020 season.<sup>972</sup> The approval of commercial use of Bt cotton in Nigeria, in 2018, was driven in part by the Nigerian government’s stated goal of reviving the country’s textile manufacturing sector.<sup>973</sup> In 2010, the Nigerian government launched the Cotton, Textile and Garment Industry Revival Scheme, an initiative to reanimate its once booming textile industry, of which cotton is the primary input. The government invested 100 billion naira (about \$278 million) in this effort, although the results have been mixed.<sup>974</sup> In 2019, the Central Bank of Nigeria (CBN) introduced two measures—one to incentivize textile production in Nigeria and the other to discourage imports of lower-priced textiles. To achieve the former, CBN launched the “Anchor Borrowers Programme,” aimed at reviving Nigeria’s cotton, textile, and garment industries.<sup>975</sup> To carry out the latter, the CBN announced that importers of foreign textiles are ineligible to receive foreign exchange from its official window, in an effort to reduce imports of textiles from other countries.<sup>976</sup> The CBN also announced that beginning in 2020, textile producers in Nigeria have to source all their cotton from domestic growers.<sup>977</sup>

As part of this program, the CBN started by facilitating the importation of higher-quality hybrid (i.e., non-biotech) cottonseeds to be distributed farmers in the country to increase domestic cotton production.<sup>978</sup> The CBN also set up the Textile Revival and Implementation Committee, which is tasked with restoring production in at least 50 textile firms by 2023.<sup>979</sup> The bank expected 20 of those 50 firms to start operations by the end of 2019.<sup>980</sup> Combined with these efforts, Bt cotton is seen as a key factor for increasing textile production in Nigeria, as the approved varieties are expected to increase cotton yields while reducing the cost of production for farmers.<sup>981</sup>

In order to allow commercial production of biotech crops, the Nigerian government approved legislation—the National Biosafety Act of 2015—and a new regulatory framework, including the National Biosafety Regulations adopted in 2017 and the National Biosafety Guidelines published in 2018.<sup>982</sup> The National Biosafety Act of 2015 created and authorized the National Biosafety Management Agency (NBMA), which is in charge of enforcing the regulatory framework for biotechnology in Nigeria.

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<sup>972</sup> In 2013, it was estimated that Nigeria had about 1.3 million cotton farmers. Opoku, “This Is How Nigeria Plans to Avoid,” October 4, 2019; COPMA, “Issues as Nigerian Farmers Welcome GMO Cotton” (accessed November 26, 2019).

<sup>973</sup> The Nigerian government also announced its intention of using biotech crops as a tool to achieve food security in the county and feed a growing population. USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019; Malik, “Nigeria Seeks to Revive Cotton Industry,” May 20, 2019.

<sup>974</sup> Agoa.info, “Reviving Nigeria’s Ailing Textile Industry,” February 17, 2013; IndustriALL, “100 Jobs Lost,” April 13, 2018.

<sup>975</sup> Russell, “Nigeria Launches Initiative,” September 24, 2019.

<sup>976</sup> Isaac, “Nigeria Moves to Revive,” April 9, 2019.

<sup>977</sup> Isaac, “Nigeria Moves to Revive,” April 9, 2019.

<sup>978</sup> Russell, “Nigeria Launches Initiative,” September 24, 2019; Malik, “Nigeria Seeks to Revive Cotton Industry,” May 20, 2019.

<sup>979</sup> Fibre2Fashion, “CBN Makes Efforts to Revive,” July 16, 2019.

<sup>980</sup> Fibre2Fashion, “CBN Makes Efforts to Revive,” July 16, 2019.

<sup>981</sup> Isaac, “Nigeria Moves to Revive,” April 9, 2019.

<sup>982</sup> Kuhlmann, written submission to USITC, July 30, 2019; USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019.

It was also tasked with creating an “institutional and administrative mechanism for safety measures in the application of modern biotechnology” to prevent adverse effects on human, animal, and plant health, as well as the environment.<sup>983</sup> The act also created the National Biosafety Committee, which reviews applications for biotech seeds and conducts socioeconomic analyses, as well as risk assessments on the seeds. The committee recommends any applications it deems safe to the NBMA.<sup>984</sup>

## Results

Although final results are not yet available, the Nigerian government and the domestic cotton industry expect that the use of Bt cotton will lead to a substantial increase in cotton yields and output in the country.<sup>985</sup> The Nigerian government set the goal of increasing cotton output in Nigeria by about 275 percent in three years, from 80,000 metric tons (mt) in 2018 to 300,000 mt in 2020.<sup>986</sup> Nigeria’s cotton yields in 2018 averaged 190 kilograms (kg) per hectare, less than one-fourth of the world average of 771 kg per hectare.<sup>987</sup> Moreover, the approved Bt cotton varieties are also expected to increase the quality of Nigerian cotton, while reducing pesticide applications from six to seven times in a crop year to two applications or less.<sup>988</sup> Nigeria is currently not a substantial exporter of cotton. However, if Nigeria’s cotton production outpaces the growth of its textile sector, the country could increase its participation in the global market.

Global experiences with Bt cotton have been mixed. Estimates of the economic benefits of Bt cotton production in South Africa indicate that the country obtained \$34.5 million in economic gains during 1998–2016 due to the use of this technology.<sup>989</sup> South African cotton yields have increased by 195 percent, from 382 kg per hectare in 1997 to 1,128 kg per hectare in 2018.<sup>990</sup> Yields in South Africa were 1.46 times the world average in 2018, and about 6 times those in Nigeria.<sup>991</sup> However, while biotech seeds generally reduce the cost of production by reducing the need for pesticides and other plant protection practices, the price of biotech seeds is usually higher than that of conventional seeds, sometimes offsetting this savings.<sup>992</sup>

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<sup>983</sup> The National Biosafety Act of 2015 also sets the risk assessment requirements for each applicant seeking approval of biotech crops, and lists offenses and penalties relevant to enforcing the rules and regulations established by the Act and the NBMA, among others. Government of Nigeria, “National Biosafety Management Agency Act 2015” (accessed February 14, 2020).

<sup>984</sup> USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019, 6–7.

<sup>985</sup> Isaac, “Nigeria Commercializes Bt Cotton,” July 30, 2018.

<sup>986</sup> Malik, “Nigeria Seeks to Revive Cotton Industry,” May 20, 2019.

<sup>987</sup> USDA, FAS, PSD Online database (accessed November 8, 2019).

<sup>988</sup> COPMA, “Issues as Nigerian Farmers Welcome GMO Cotton” (accessed November 26, 2019).

<sup>989</sup> Estimates of economic gains take into account farm income and production effects, as well as environmental changes derived from changes in the use of chemicals and reductions in greenhouse gas emissions. In the case of South Africa, the main impact on farm income from Bt cotton resulted from higher yields; the added cost of the technology has outweighed the savings in insecticide and labor costs. Brookes, *GM Crops: Global Socio-economic and Environmental Impacts*, June 2018, 66–67; ISAAA, *Biotech Country Facts* (accessed November 12, 2019), 2.

<sup>990</sup> USDA, FAS, PSD Online database (accessed November 8, 2019).

<sup>991</sup> USDA, FAS, PSD Online database (accessed November 8, 2019).

<sup>992</sup> COPMA, “Issues as Nigerian Farmers Welcome GMO Cotton” (accessed November 26, 2019); industry representative, telephone interview by USITC staff, October 17, 2019.

Additionally, recent experiences indicate that adoption of biotech crops without the adoption of other good agricultural practices does not result in overall improvements in output and product quality. For example, although the introduction of Bt cotton in India led to a substantial decrease in the presence of bollworm and to economic gains from Bt production for Indian growers,<sup>993</sup> it only led to slightly higher yields.<sup>994</sup> Although India is the largest cotton producer in the world by volume, unfavorable agronomic conditions, such as poor irrigation of the crops, have limited India's increase in yields from Bt cotton production.<sup>995</sup> Since India and SSA share similar climate and agronomic conditions, industry experts warn that, if other efforts are not in place, such as improvements to irrigation systems, SSA countries in general, and Nigeria in particular, could experience only a temporary increase in cotton output.<sup>996</sup>

Some observers have also expressed concern about the experience of Burkina Faso, which allowed commercial production of Bt cotton in 2008. Burkina Faso phased out production of this biotech crop in 2015 due to complaints about the low quality and short fiber length of the product.<sup>997</sup> However, the Bt cotton varieties planted in Burkina Faso had been developed using U.S. cotton plants, which were adapted to a different climate. In contrast, since the cotton varieties registered for commercial production in Nigeria were developed for the Nigerian climate, Nigerian scientists anticipate better results than those obtained in Burkina Faso.<sup>998</sup>

## Further Application in SSA

Biotech adoption is expanding not only to other crops in Nigeria, but also to other SSA countries. Specifically, Nigeria plans to expand commercial biotech production to crops such as cowpea, sorghum, rice, and cassava, which are being developed in collaboration with international seed companies and nonprofit organizations, including U.S.-based Corteva Agriscience and the Bill and Melinda Gates Foundation.<sup>999</sup> Moreover, other SSA countries now allow production of biotech crops or are expected to do so in the near future.<sup>1000</sup> For example, after Nigeria allowed commercial production of Bt cotton in 2018, scientists in Ghana asked the local government to resume working towards allowing commercial

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<sup>993</sup> India has obtained economic gains amounting to \$21.12 billion since Bt cotton was introduced in 2002 to 2016. In the case of India, the main impact on farm income from Bt cotton resulted from slightly higher yields, while the additional cost of the technology has been greater than the savings in insecticide and labor costs. Brookes, *GM Crops: Global Socio-economic and Environmental Impacts*, June 2018, 67–68.

<sup>994</sup> Industry representative, telephone interview by USITC staff, October 17, 2019.

<sup>995</sup> In 2018, cotton yields in India averaged 458 kilograms (kg) per hectare, 1.7 times below the global average. USDA, FAS, PSD Online database (accessed November 8, 2019); University of Montana, "Bt cotton: Explanation" (accessed November 12, 2019); industry representative, telephone interview by USITC staff, October 17, 2019; Statista, "World Cotton Production by Country 2019" (accessed November 12, 2019).

<sup>996</sup> Industry representative, telephone interview by USITC staff, October 17, 2019.

<sup>997</sup> Opoku, "This Is How Nigeria Plans to Avoid," October 4, 2019.

<sup>998</sup> Opoku, "This Is How Nigeria Plans to Avoid," October 4, 2019.

<sup>999</sup> In 2019, Nigeria allowed commercial production of pod-borer resistant cowpea. Additionally, Nigeria plans to develop and commercialize three more crops over the next five years: Africa biofortified sorghum, nitrogen- and water-use efficient and salt-tolerant rice, and genetically engineered cassava. Moreover, the country is looking to develop drought-tolerant maize, herbicide-tolerant soybean, and virus-resistant and nutritionally enhanced cassava. ISAAA, "Nigeria Commercializes Pod Borer Resistant Cowpea," December 18, 2019; USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019, 5.

<sup>1000</sup> USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019, 5.

production of Bt cotton in the country, which is affected by many of the same challenges Nigerian farmers face, including cotton bollworm. Ethiopia authorized the cultivation of biotech cotton in 2018, while taking steps to allow other biotech food crops, such as biotech maize. Kenya approved commercial planting of Bt cotton in 2019,<sup>1001</sup> while research trials for biotech cassava, sorghum, sweet potato, and banana are underway.<sup>1002</sup>

Further, the Economic Community of West African States (ECOWAS) approved a draft biosafety regulation for the region in 2019.<sup>1003</sup> This regulation aims to provide ECOWAS with a uniform approach to the use of “modern biotechnologies” and address the “weak technical, institutional and regulatory capacities” of ECOWAS’s member states on these issues.<sup>1004</sup> Additionally, recent developments from research on a variety of biotech crops, such as drought-tolerant maize and fortified sorghum, indicate a potential expansion in the application of biotechnology that could benefit SSA countries.<sup>1005</sup>

Developing regulatory frameworks that enable commercial production of biotech crops and provide regulatory certainty to producers is key to increasing adoption of biotech crops in SSA. Generally, the development and commercialization of biotech crops is a lengthy and costly process. It takes 13.1 years, on average, from discovering a biotech trait to launching it for commercial production and about 37 percent of this time is spent dealing with registration and regulatory affairs.<sup>1006</sup>

Moreover, companies that develop and commercialize biotech seeds often have no incentive to supply the SSA market due to poor regulatory frameworks in most SSA countries, which includes deficient protection of intellectual property.<sup>1007</sup> This situation hampers the introduction of biotech seeds in these countries and increases the cost of doing business in the region.<sup>1008</sup> Additionally, the large number of governments in SSA and the heterogeneity of the regulations makes it more difficult for companies supplying agricultural inputs, such as biotech seeds, to establish a presence in the region.<sup>1009</sup> Moreover, certain SSA countries have required that these companies conduct research and development of new biotech varieties locally, which can increase the cost of bringing new biotech varieties to the market. The expense often exceeds the potential returns that these companies could obtain from commercializing their products in SSA.<sup>1010</sup>

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<sup>1001</sup> ISAAA, “Bt Cotton Approved for Planting in Kenya,” December 19, 2019.

<sup>1002</sup> Kuhlmann, written submission to the USITC, July 30, 2019.

<sup>1003</sup> ECOWAS, “ECOWAS Moves to Ensure Biosafety,” May 18, 2019.

<sup>1004</sup> ECOWAS, “ECOWAS Moves to Ensure Biosafety,” May 18, 2019.

<sup>1005</sup> USDA, FAS, *Nigeria: Agricultural Biotechnology Annual 2019*, May 5, 2019, 4–5.

<sup>1006</sup> It was estimated that the cost of introducing a new biotechnology trait between 2008 and 2012 was about \$136 million. CropLife International, “Cost of Bringing a Biotech” (accessed November 12, 2019).

<sup>1007</sup> Industry representative, telephone interview by USITC staff, September 19, 2019.

<sup>1008</sup> Industry representative, telephone interview by USITC staff, September 19, 2019.

<sup>1009</sup> Industry representative, telephone interview by USITC staff, September 19, 2019.

<sup>1010</sup> Industry representative, telephone interview by USITC staff, September 19, 2019.

## Case Study 6.2: Opportunities for Digital Management of the Cocoa Supply Chain Using Blockchain

### Summary

This case study discusses the potential of blockchain technology in cocoa supply chain management and traceability in SSA. Most cocoa is grown in West Africa today, and it is especially important to the economies of Côte d'Ivoire and Ghana.<sup>1011</sup> For decades consumers and international organizations have expressed concern about environmental and labor problems associated with cocoa production in West Africa, particularly the use of child labor.<sup>1012</sup> The U.S. law that enables Customs to block imports that use forced labor was strengthened in 2015 by eliminating the “consumptive demand” clause, though this law addresses forced labor and not child labor specifically. Other governments have also passed legislation targeting labor abuses in supply chains.<sup>1013</sup> As demand for more responsibly sourced cocoa increases, farmers and downstream producers are turning to new technologies to increase transparency and efficiency along the supply chain, following other export-oriented industries in SSA, such as cobalt mining.<sup>1014</sup>

One such technology is blockchain. Blockchain is an immutable distributed digital ledger made up of blocks of data that are verified by user consensus rather than being maintained by a central authority. Blockchain provides the opportunity for producers to realize supply chain efficiencies that lower production costs; save time in the auditing process required to receive fair trade/labor/environmental sustainability certifications, allowing access to price premiums for suppliers; and ensure traceability of the product in order to respond to supply issues, such as inventory uncertainty and disease outbreaks.<sup>1015</sup>

While implementation of blockchain is still in the beginning stages in the cocoa value chain, early adoption stories are positive and show benefits for cocoa farmers as well as downstream buyers. The two pilot programs in Côte d'Ivoire featured in this case study demonstrate that blockchain can

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<sup>1011</sup> Cocoa production is also important to the economies of Nigeria, Cameroon, and Togo, though to a lesser extent.

<sup>1012</sup> Whoriskey and Siegel, “Cocoa’s Child Laborers,” June 5, 2019; ILO, “Rooting out Child Labour from Cocoa Farms,” 2007, 3-6; ILO, “A Partnership to Combat Child Labour,” 2015. See also Salaam-Blyther, Hanrahan, and Cook, “Child Labor in West African Cocoa Production,” July 13, 2005; USDOL, “Survey Research on Child Labor,” July 30, 2015; DOL, “Final Report: Survey Research on Child Labor,” 2015.

<sup>1013</sup> The Trade Facilitation and Trade Enforcement Act of 2015 repealed the “consumptive demand” clause that stated that certain goods made with forced labor could be imported “if the goods were not produced in such quantities in the United States as to meet the consumptive demands of the United States.” The UK passed the Modern Slavery Act 2015 that required larger businesses to disclose annually the actions taken to ensure there is no modern slavery in their business or supply chain. CBP, “Forced Labor” (accessed March 13, 2020); Government of the United Kingdom, “Modern Slavery” (accessed March 13, 2020).

<sup>1014</sup> For a brief discussion of cobalt mining, see box 4.1 in chapter 4.

<sup>1015</sup> Lopez, “IBM Takes Its Food Supply Blockchain Solution Worldwide,” October 8, 2018; Shister, “From Bean to Bar: Trends and Opportunities in Cocoa Supply Chain Transparency,” July 19, 2019; industry representative, telephone interview by USITC staff, October 24, 2019.

successfully be developed for the cocoa supply chain. Study of these programs helps to identify three key components necessary for successful implementation: a large stakeholder to fund the network, a large enough supply chain network to reach economies of scale, and a strong system of cooperatives.

## Technology

Digital supply chain management helps farmers and downstream companies better trace agricultural supply chains by creating more reliable transaction ledgers to track yields, sales, and deliveries, as commodities move from the farm through the cooperative to the final buyers. This type of tracking not only improves efficiencies that keep production costs low, but also improves the ability to obtain the valuable fair trade, environmental, and food safety certifications that yield price premiums. In SSA, farmers of export-oriented cash crops like cocoa face obstacles associated with inefficient and opaque supply chains. These problems also affect downstream members of the supply chain, which for cocoa include cooperatives, commodity traders, and multinational cocoa and confectionery companies.

Traditionally, cash crop farmers in SSA, including cocoa farmers, have relied on analog record keeping methods such as paper ledgers. More recently, however, they have been opting for simple digital solutions, like individually maintained online spreadsheets.<sup>1016</sup> Yet these solutions have problems of their own. For instance, individually maintained online spreadsheets require each participant to track their own transactions and assets in house, which leads to higher costs and the duplication of efforts as different parties maintaining their own ledgers. Furthermore, these individually maintained ledgers make it difficult to track inventory across the entire supply chain in real time. As a result, the downstream multinational enterprises (MNEs) face delays in verifying compliance and sourcing, which delay purchasing and production decisions.<sup>1017</sup> Such delays in verifying transactions can threaten farmers' ability to realize the price premiums that come with fair trade, environmental, or food safety certifications.<sup>1018</sup>

Blockchain technology is the newest innovation in digital supply chain management. It is seen as a useful tool for managing complicated supply chains that require a higher level of oversight or transparency for safety, quality control, and accountability.<sup>1019</sup> Blockchain is a digital ledger that is made up of blocks of transactions not maintained by any central authority.<sup>1020</sup> It helps mitigate human error because it is a consensus model with all parties validating transactions, which makes data more secure, reliable, and resistant to tampering. Blockchain can strengthen trust among all members of the supply chain,<sup>1021</sup> and

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<sup>1016</sup> Industry representative, telephone interview by USITC staff, October 24, 2019; Chainpoint, "Tony's Chocolonely—Transforming the Cocoa Industry" (accessed October 15, 2019); Chainpoint, "The Rainforest Alliance" (accessed October 15, 2019).

<sup>1017</sup> Industry representative, telephone interview by USITC staff, October 24, 2019.

<sup>1018</sup> IBM, "What Is Blockchain Technology?" (accessed October 15, 2019); Gupta, *Blockchain for Dummies*, 2018.

<sup>1019</sup> IBM, "What Is Blockchain Technology?" (accessed October 15, 2019); Gupta, *Blockchain for Dummies*, 2018.

<sup>1020</sup> This is in contrast with a federated ledger, where every member of the supply chain maintains their own ledger within a federated system. The blockchain architecture is structured so that all participants have access to a shared ledger that is updated in real time through peer-to-peer replication.

<sup>1021</sup> If an error needs to be corrected, a second transaction must be entered to correct the error: all these transactions must be validated by the other participants and are visible to everyone in the network. In blockchain, both the sender and receiver of the transaction validate its accuracy, thus creating a consensus model. Because of

can increase efficiency as well because, once entered into the system, the information is immediately available to all parties.

In blockchain, each participant acts as a node within the network; data are simultaneously synchronized across the network when a transaction occurs, allowing all parties to track an asset in real time.<sup>1022</sup> This makes it possible to predict volumes more effectively by providing real-time overall inventory balances. Participants can also quickly detect and resolve any issues within the supply chain.<sup>1023</sup> Firms, too, have an economic incentive to use blockchain for supply chain traceability. One report estimated that supply chain inefficiencies in global agriculture cost all firms roughly \$60 billion annually through higher prices, an increased carbon footprint, and more food waste in the transportation process.<sup>1024</sup>

For these reasons, blockchain is already being implemented in a number of agricultural supply chain tracing systems, such as leafy greens in the United States, and is now being introduced to the cocoa industry around the globe and in SSA.<sup>1025</sup> Figure 6.4 illustrates the difference between tracking systems using traditional ledgers<sup>1026</sup> and those that use blockchain.

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these features, the data in this model are more secure, more reliable, and more resistant to tampering than in conventional ledgers.

<sup>1022</sup> Lopez, “IBM Takes Its Food Supply Blockchain Solution Worldwide,” October 8, 2018.

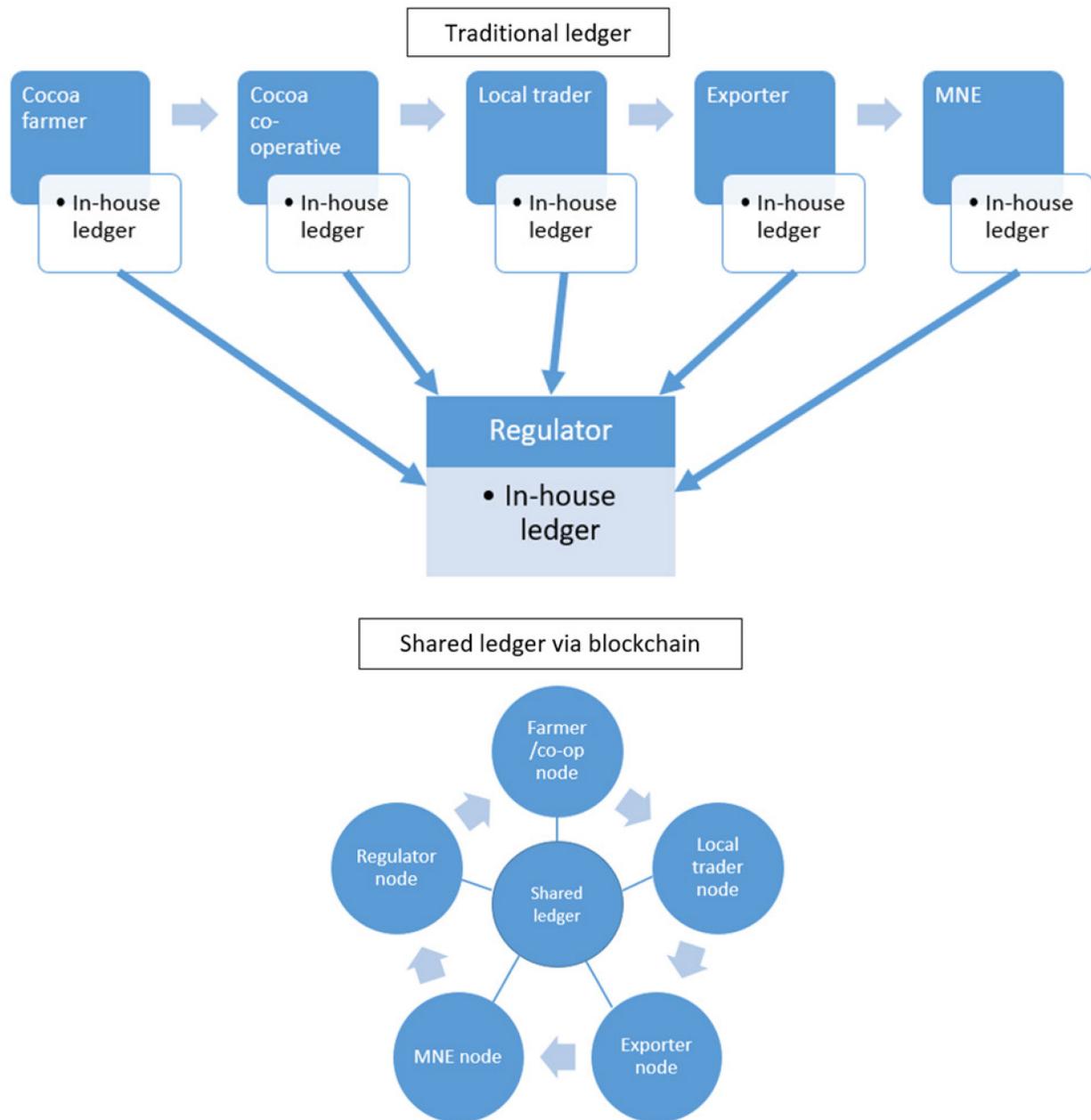
<sup>1023</sup> Industry representative, telephone interview by USITC staff, October 24, 2019; IBM, “What Is Blockchain Technology?” (accessed October 15, 2019); Gupta, *Blockchain for Dummies*, 2018.

<sup>1024</sup> Thompson, “Blockchain for Cocoa? Maybe,” March 20, 2019. See also Shister, “From Bean to Bar: Trends and Opportunities,” July 19, 2019; Myers, “Blockchain Innovation in the Cocoa Supply Chain,” March 15, 2019.

<sup>1025</sup> IBM, “IBM Food Trust” (accessed October 15, 2019); Lopez, “IBM Takes Its Food Supply Blockchain Solution Worldwide,” October 8, 2018.

<sup>1026</sup> Traditional ledgers include both paper and digital records that are individually maintained.

**Figure 6.4** Tracking cocoa with a traditional federated ledger and with a shared ledger via blockchain



Source: USITC, based on Gupta, *Blockchain for Dummies*, 2018.

Using blockchain has benefits for both farmers and processors. For farmers of cash crops like cocoa, blockchain reduces costs associated with demonstrating compliance with certification schemes, which then allows farmers to access price premiums when selling their crops. In recent years, Côte d’Ivoire and Ghana have produced roughly 500,000 metric tons of certified cocoa, garnering a certification premium of up to \$200 per metric ton for the farmers.<sup>1027</sup> Plugging into digital supply chain management systems

<sup>1027</sup> Aboa and Angel, “Chocolate Makers Face Ethical Branding Dilemma,” October 15, 2019.

(either a traditional federated ledger or a shared ledger such as blockchain) makes it easier for farmers to access premium pricing by differentiating their crops in the form of certified products.<sup>1028</sup> Joining cooperatives can make it easier for farmers to participate in blockchain-based verification systems and for downstream firms to implement them.<sup>1029</sup> Cooperatives enable farmers to pool their resources for the installation of necessary digital infrastructure. They also allow farmers to better disseminate information, access farmer training programs, and build closer relationships with MNEs (who find it more efficient to work with cooperatives than individual farmers).<sup>1030</sup> In addition to the benefits of blockchain systems, the resulting economic benefits of cooperative membership may also lead to increased yields and acreage, boosting future production.

For processors and chocolate producers, integrating blockchain into their agricultural supply chain management systems allows greater reliability and traceability. It also simplifies source tracking for labor and environmental certification purposes, such as Fair Trade and Rainforest Alliance certifications in cocoa. In addition to in-person inspections on farms, these certifying organizations regularly audit transaction records to ensure consistent adherence to certification requirements.<sup>1031</sup> Some industry representatives have suggested blockchain can save up to 150 hours per farmer in the auditing process due to reduced paperwork.<sup>1032</sup> Blockchain ledgers also quickly illuminate inefficiencies within the supply chain. When integrated with other innovations such as Internet of Things-enabled sensors, blockchain can help promote more efficient farming practices.

While implementing blockchain can address several issues with agricultural supply chain management, adoption in developing regions such as SSA has remained limited. This is primarily due to the high costs associated with building and migrating to a blockchain network, as well as difficulty digitally obtaining timely and reliable data on physical goods.<sup>1033</sup> Blockchain networks are highly individualized, being based on supply chain attributes, and thus need to be custom designed, further raising early-stage expenses.<sup>1034</sup> These large initial fixed costs make blockchain more cost efficient with larger networks of participants<sup>1035</sup> (such as cooperatives). While the initial startup cost is high, the cost of maintaining the network and adding additional participants is relatively low.<sup>1036</sup>

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<sup>1028</sup> Tony's Chocolonely, "Tony's Impact" (accessed October 14, 2019).

<sup>1029</sup> Industry representative, telephone interview by USITC staff, October 24, 2019

<sup>1030</sup> Cargill, "Cargill Coop Academy Helps Upskill West African Cocoa Farmers," July 9, 2018.

<sup>1031</sup> Fairtrade International, "How Fairtrade Certification Works" (accessed December 20, 2019).

<sup>1032</sup> Industry representative, "Blockchain Masterclass for Smallholders," panel discussion at the African Green Revolution Forum, Accra, Ghana, September 2019.

<sup>1033</sup> Barnhart and Edgett, "Supply Chain Management: What's Next?" November 14, 2019; industry representative, telephone interview by USITC staff, October 24, 2019; Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018.

<sup>1034</sup> Industry representative, telephone interview by USITC staff, October 24, 2019.

<sup>1035</sup> Barnhart and Edgett, "Supply Chain Management: What's Next?" November 14, 2019.

<sup>1036</sup> Barnhart and Edgett, "Supply Chain Management: What's Next?" November 14, 2019; industry representative, telephone interview by USITC staff, October 24, 2019.

## Market

The market conditions of cocoa production in West Africa make the industry a candidate to use blockchain for supply chain traceability. With an estimated 1 million cocoa farmers, Côte d'Ivoire is the world's leading exporter of cocoa beans. The country had reported exports in excess of 1.5 million tons in 2018, accounting for roughly 45 percent of reported global cocoa bean exports. Ghana is the second-largest exporter, and West Africa as a whole accounts for around 70 percent of global cocoa bean production, exporting over 2.5 million tons of cocoa beans.<sup>1037</sup> The cocoa supply chain stemming from SSA begins with a large number of smallholder cocoa farmers subject to the volatile prices associated with commodities. In fact, about 90 percent of cocoa globally is produced by smallholders.<sup>1038</sup>

For years, cocoa farmers have been organizing into more advanced cocoa-growing cooperatives to help facilitate sales and disseminate innovations in cocoa farming.<sup>1039</sup> These cooperatives work with MNEs and organizations like the World Cocoa Foundation to provide training, improve quality and yields, and obtain the highest prices possible.<sup>1040</sup> Cocoa beans are purchased most often by large MNEs with headquarters and operations in Europe and North America.<sup>1041</sup> The MNEs are vertically integrated, purchasing cocoa beans directly from farmers or cocoa cooperatives in cocoa-growing countries and from local cocoa bean traders. The MNEs then export beans to facilities located closer to final chocolate and confectionery consumers in the United States, Canada, and European countries such as the Netherlands, Belgium, and Germany, where they process the beans into intermediate products and finished chocolate goods.<sup>1042</sup> The downstream chocolate confectionery MNEs are large and highly concentrated.<sup>1043</sup>

Global demand for cocoa has been on the rise,<sup>1044</sup> and consumers worldwide have begun demanding differentiated cocoa products that are ethically and sustainably produced.<sup>1045</sup> News outlets have been alerting the public about labor and environmental concerns over cocoa production.<sup>1046</sup> Furthermore, local and national governments are enacting laws that require supply chain transparency and traceability to ensure that production meets certain labor and environmental standards.<sup>1047</sup> As noted above, certifications from nongovernmental organizations (NGOs) that are widely recognized by

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<sup>1037</sup> Global Trade Atlas, HTS subheading 1801.00 (accessed October 15, 2019).

<sup>1038</sup> Barry Callebaut, "Empowering Cocoa Farmers: Barry Callebaut's Commitment," 2007, 11; Gaiachain, "Pilot Projects: Cocoa" (accessed November 21, 2019).

<sup>1039</sup> Lorenzetti, "Cocoa Farmers Band Together for Profits" (accessed October 15, 2019).

<sup>1040</sup> Barry Callebaut, "Empowering Cocoa Farmers: Barry Callebaut's Commitment," 2007, 12, 18–23, 27.

<sup>1041</sup> IBISWorld, *Global Candy and Chocolate Manufacturing*, August 2018, 23.

<sup>1042</sup> Amir, *Chocolate Production in the US*, February 2019, 14–17. For more information on the chocolate production process, see ICCO, "Processing Cocoa," June 7, 2013.

<sup>1043</sup> Shister, "From Bean to Bar: Trends and Opportunities," July 19, 2019; IBISWorld, *Global Candy and Chocolate Manufacturing*, August 2018, 23.

<sup>1044</sup> This rise has been driven almost entirely by Asia, and particularly China. While demand has been weakening in Europe and North America, the massive market in China still allows for growth potential in cocoa consumption. MarketWatch, *Global Cocoa and Chocolate Market 2019*, February 12, 2019.

<sup>1045</sup> Aboa and Angel, "Chocolate Makers Face Ethical Branding Dilemma," October 15, 2019.

<sup>1046</sup> Whoriskey and Siegel, "Cocoa's Child Laborers," June 5, 2019.

<sup>1047</sup> California Department of Justice, "The California Transparency in Supply Chains Act," January 1, 2012; United Kingdom, "Transparency in Supply Chains," August 14, 2019.

consumers are further incentivizing MNEs to develop more traceable supply chains. To receive certifications from organizations like the Rainforest Alliance, Fair Trade, and Non-GMO Project, MNEs must verify that the entire supply chain meets the NGO's standards.<sup>1048</sup> To better comply with the auditing process required to achieve these certifications, MNEs are moving towards adopting advanced technological solutions for a traceable supply chain.

## Adoption

As discussed earlier, SSA has not yet seen widespread adoption of blockchain technology in agricultural supply chain management.<sup>1049</sup> However, technology and software companies like U.S.-headquartered IBM and EU-headquartered ChainPoint are developing blockchain platforms to work with agricultural supply chains around the world, including SSA. NGOs such as the Rainforest Alliance and global consulting firms like Accenture have recently begun collaborating with chocolate companies, cocoa cooperatives, and individual cocoa farmers to implement blockchain as a supply chain tracking tool to help “digitize the first mile” of cocoa production.<sup>1050</sup>

The first example of blockchain implementation within the cocoa supply chain in SSA is a pilot program developed by Accenture and Amsterdam-based chocolate company Tony's Chocolonely (“Tony's”).<sup>1051</sup> In 2015, Tony's started looking for digital solutions to trace its supply chain as it sought to ensure its cocoa products did not support involuntary labor or other abuses, ultimately deciding on a digital federated ledger. In 2017, the technology-focused arm of Accenture approached Tony's to develop a “proof of concept” pilot of a supply chain tracking platform using blockchain. The pilot program included one cocoa cooperative in Côte d'Ivoire, one local trader, and one international trader who ultimately exported the cocoa beans to Tony's production facilities in Europe.

The program began in January 2018 and lasted for six weeks. The blockchain pilot contained a web application to enter data, a multichain blockchain platform, and integration services between the app and the platform housed on cloud-based infrastructure. Tony's used its annual meeting with suppliers to train farmers and cooperative representatives to use the system. During the six-week program, participating farmers brought their cocoa beans to the cooperative, where they input data into the

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<sup>1048</sup> While blockchain technology allows cocoa processors to trace the source of inputs into the supply chain and verify that only certified cocoa is used in chocolate production, this may or may not improve the certification scheme conducted by third parties. For more information on this issue, see Whoriskey, “Chocolate Companies Sell ‘Certified Cocoa,’” October 23, 2019; Rainforest Alliance, “Our Response to the Washington Post's Report,” October 23, 2019.

<sup>1049</sup> Blockchain use in cocoa farming and the chocolate supply chain is a relatively new innovation. As such, its impact on the sector cannot yet be fully estimated.

<sup>1050</sup> Large MNEs like the Hershey Co. (Hershey), Mars Wrigley Confectionery (Mars), Cargill Corporation (Cargill), and boutique firms like Tony's Chocolonely (Tony's), which is based in Amsterdam, are using new technology to trace their supply chain in order to address environmental and labor issues. Myers, “Blockchain Innovation in the Cocoa Supply Chain,” March 15, 2019; Cargill, *The 2017/2018 Cargill Cocoa & Chocolate Sustainability Report*, 2018.

<sup>1051</sup> Other firms are working to integrate blockchain into the cocoa supply chain, but to date the Tony's/Accenture collaboration and Nitidæ's COCOBLOCK program are the only examples of a functioning blockchain system for supply chain traceability in cocoa production in SSA.

blockchain ledger using the cooperative's online infrastructure. The local and international traders would enter transactions when they received cocoa beans and again as they passed the cocoa beans down the supply chain. Finally, staff at Tony's European production facilities would input their receipts from the international trader to complete the blockchain. The program was largely successful: the blockchain ledger registered around 900,000 kg of cocoa beans across 400 transactions during the six-week period.<sup>1052</sup> The project generated buy-in almost immediately, aided by the ability to use existing computers at the cooperative to input data.<sup>1053</sup>

A similar effort is currently underway, implemented by Nitidæ, a nonprofit association based in SSA. Working with the software company Gaiachain, Nitidæ obtained funding from the Technical Centre for Agricultural and Rural Co-operation (CTA),<sup>1054</sup> an international NGO, to develop blockchain solutions in the agricultural sector. In June 2019, Nitidæ rolled out COCOBLOCK in Côte d'Ivoire. The primary goal of the project is to garner a better understanding of the costs associated with implementing blockchain in the cocoa supply chain and determine potential benefits.<sup>1055</sup> Set to run through February 2020, the program aims to develop and test a blockchain-based traceability system to increase transparency, reduce transaction costs, and increase profit margins for sustainably produced cocoa. The COCOBLOCK project includes 28 cooperatives encompassing over 12,000 farmers and 41,000 hectares (ha) of cocoa.<sup>1056</sup>

The program consists of three components. First, Nitidæ is working on raising awareness of the availability and potential benefits of using blockchain technology, and COCOBLOCK specifically, in the cocoa supply chain. Second, working with Gaiachain, Nitidæ is developing and testing the blockchain system.<sup>1057</sup> The final component will be to share results and provide recommendations for long-term strategies of blockchain implementation in the cocoa supply chain.<sup>1058</sup> Nitidæ anticipates three additional major outcomes from the program. First, stakeholders along the cocoa supply chain will be made aware of the opportunities and potential drawbacks of implementing a blockchain system. Second, a viable blockchain system designed for supply chain traceability will be available for stakeholders. Third, possibilities for reducing the transaction costs of transfer payments will be identified.<sup>1059</sup>

## Results

While pilot programs and "proof of concept" projects are occurring more often, the cocoa supply chain has not seen large-scale adoption of blockchain technology. Although the Tony's pilot was a successful "proof of concept" project, after the closure of the program, Tony's returned to its original digital

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<sup>1052</sup> Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018.

<sup>1053</sup> Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018; industry representative, telephone interview by USITC staff, October 24, 2019.

<sup>1054</sup> CTA is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). CTA, "About Us" (accessed December 4, 2019).

<sup>1055</sup> Gaiachain, "Pilot Projects: Cocoa" (accessed November 21, 2019).

<sup>1056</sup> Nitidæ, "COCOBLOCK—The Blockchain for a Better Traceability" (accessed November 4, 2019).

<sup>1057</sup> Nitidæ, "COCOBLOCK—The Blockchain for a Better Traceability" (accessed November 4, 2019).

<sup>1058</sup> Nitidæ, "COCOBLOCK—The Blockchain for a Better Traceability" (accessed November 4, 2019).

<sup>1059</sup> Nitidæ, "COCOBLOCK—The Blockchain for a Better Traceability" (accessed November 4, 2019).

federated ledger. Tony's noted blockchain's potential, but said their original digital solution adequately addressed the company's needs.<sup>1060</sup> Additionally, it is possible its supply chain network may have been too small to reach the economies of scale necessary to get an appropriate return on a full blockchain investment.<sup>1061</sup> One of the largest obstacles faced during the Tony's blockchain pilot was obtaining reliable data in a timely fashion. While blockchain is relatively easy to adopt with a virtual product like Bitcoin or mobile money, accurately tracking items in a physical value chain is more challenging without additional technologies like barcoded tokens to digitize the data.

In addition to the high startup costs and general difficulty of digitally tracking agricultural commodities, other aspects of blockchain technology may slow adoption in supply chain management. First, blockchain has inherent drawbacks in that transactions need to be entered chronologically, which means the whole chain may be halted through delays by one party. Second, it is difficult to correct errors in a blockchain ledger, requiring at least one new transaction to be entered canceling out the mistake.<sup>1062</sup> Third, the large information and communications technology (ICT) infrastructure needed for blockchain may also prevent wider adoption.<sup>1063</sup> While a cloud-based blockchain platform limits the need for extensive in-house hardware, only South Africa currently has a well-developed public cloud infrastructure, and access to the internet is limited in many SSA countries (see case study 7.1 in chapter 7 for further discussion of cloud infrastructure in SSA). However, the growth of cooperatives may mitigate some of these negative factors, as cooperatives can pool resources to invest in the necessary infrastructure and training.

The pilot programs in Côte d'Ivoire have both shown the potential benefits of using blockchain and helped identify three key factors to aid successful implementation in cocoa supply management. First, it appears that a large stakeholder is needed to cover up-front costs and provide training. This can be accomplished at the MNE level, as in the case of Tony's, or by an outside organization helping at the cooperative level, as in the case of Nitidæ.<sup>1064</sup> Second, the supply chain needs to encompass a large enough network to achieve a return on investment in a timely fashion. As discussed above, blockchain implementation in the cocoa sector appears to be most effective with large MNEs able to cover initial costs and a large enough network to reach economies of scale.<sup>1065</sup> Tony's also indicates that blockchain could be a viable solution for cocoa supply chain traceability as more parties participate.<sup>1066</sup> While full results of the COCOBLOCK program have yet to be determined, Nitidæ's effort appears to be trying to overcome issues related to economies of scale by applying blockchain to a larger network of suppliers.

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<sup>1060</sup> Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018.

<sup>1061</sup> Industry representative, telephone interview by USITC staff, October 24, 2019.

<sup>1062</sup> Gupta, *Blockchain for Dummies*, 2018.

<sup>1063</sup> Barnhart and Edgett, "Supply Chain Management: What's Next for Food and Beverage?" November 14, 2019.

<sup>1064</sup> Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018; Nitidæ, "COCOBLOCK—The Blockchain for a Better Traceability of Cocoa" (accessed November 4, 2019).

<sup>1065</sup> Barnhart and Edgett, "Supply Chain Management: What's Next?" November 14, 2019; industry representative, telephone interview by USITC staff, October 24, 2019.

<sup>1066</sup> Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018; industry representative, telephone interview by USITC staff, October 24, 2019. The physical to digital problem may be mitigated in the future by the development of new technologies such as automated grading and digital token system Bext360. Bext360, "Transparency that's good for everyone" (accessed October 25, 2019).

Finally, and perhaps most crucially, both pilot programs appear to have benefited from a strong system of cooperatives. This underscores the need to continue to develop more advanced cooperatives in the cocoa sector. First, cooperatives allow members to pool their resources to develop and maintain the necessary infrastructure to access an online blockchain network.<sup>1067</sup> The internet access provided by the cooperatives does not need to be particularly advanced or constant, as industry representatives have indicated that cooperative-provided internet access once a day is sufficient for integration into a supply chain using blockchain.<sup>1068</sup> Second, cooperatives are able to act as intermediaries between cocoa farmers and downstream MNEs in facilitating the implementation of new technologies like blockchain and ensuring farmers are receiving adequate compensation.<sup>1069</sup> Finally, cooperatives enable the dissemination of information on training and best practices. Programs like Cargill's Coop Academy regularly tap into the cooperative structure to share information with cocoa farmers.<sup>1070</sup> During the Tony's pilot, cooperative officials were trained to use the blockchain network in Amsterdam and then were able to share that training with cooperative members in Côte d'Ivoire.<sup>1071</sup>

### Further Application in SSA

Looking at blockchain adoption in cocoa supply chains elsewhere in the world appears to confirm the potential for benefits for West Africa. In Indonesia, for example, cocoa farmers are installing sensors that directly connect to blockchain ledgers on the cloud. The sensors automatically enter data like humidity and soil nutrient levels, alerting everyone in the supply chain to potential problems.<sup>1072</sup>

More broadly, efforts are underway to address the difficulty of tracking agricultural commodities. Cargill has recently begun using barcodes on bags of cocoa beans in Ghana to quickly digitize cocoa transactions.<sup>1073</sup> U.S.-based agricultural technology company Bext360 built a machine that can sort, weigh, and determine the quality of upstream commodities and immediately enter that data into a blockchain ledger. Initial implementation included coffee, and Bext360 is in the process of expanding into similarly produced commodities like cocoa.<sup>1074</sup> In the United States, IBM Food Trust works with major retailers like Walmart to implement blockchain in supply chain traceability in an effort to act faster in the event of food-borne disease outbreaks. In 2018, Walmart announced that all leafy greens sold in its stores, regardless of source, must be tracked on its blockchain ledger.<sup>1075</sup> According to industry research firm Gartner, blockchain can be expected to be substantially integrated into current supply tracing systems within the next 5 to 10 years.<sup>1076</sup>

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<sup>1067</sup> Lorenzetti, "Cocoa Farmers Band Together for Profits" (accessed October 15, 2019).

<sup>1068</sup> Industry representative, telephone interview by USITC staff, October 24, 2019.

<sup>1069</sup> Lorenzetti, "Cocoa Farmers Band Together for Profits" (accessed October 15, 2019).

<sup>1070</sup> Cargill, "Cargill Co-op Academy," October 13, 2017.

<sup>1071</sup> Tony's Chocolonely, "Where Blockchain and Slave Free Chocolate Come Together," July 31, 2018.

<sup>1072</sup> Stine, "How a Little Sensor is Making a Big Impact," April 15, 2019; Libelium, "Sustainable Farming and the IoT: Cocoa Research Station in Indonesia," December 15, 2015.

<sup>1073</sup> Cargill, *The 2017/2018 Cargill Cocoa & Chocolate Sustainability Report*, 2018.

<sup>1074</sup> Bext360, "Transparency That's Good for Everyone" (accessed October 16, 2019).

<sup>1075</sup> Smith, "In Wake of Romaine E. coli Scare," September 24, 2018.

<sup>1076</sup> Levy, "Understand How Blockchain Will Evolve until 2030," October 22, 2019.

## Case Study 6.3: Index-Based Crop Insurance in Kenya

### Summary

Crop insurance is an important risk management tool that can encourage the adoption of new agricultural technologies, spurring an increase in yields and productivity. Adoption of crop insurance by farmers in SSA has increased in recent years, driven by the advent of “index-based insurance” (index insurance). In an index-based system, payouts are made based on an index of a variable correlated to production, such as rainfall, rather than on data for verifiable crop losses. As a result, claims are easier and less expensive to process, making crop insurance more affordable to smallholders and less costly for insurers to provide. This case study focuses on the adoption of index crop insurance for maize (corn) in Kenya. Kenya is home to the largest index insurance program in SSA and was the first place where index insurance was provided through mobile phone technology.<sup>1077</sup>

While adoption of risk management products is not yet widespread in SSA, current efforts show the potential for a positive impact on the production of maize and reduced imports. Furthermore, such innovative, localized risk management products hold similar promise for other agricultural products as well.

### Technology

Formal risk management tools, like crop insurance, are not broadly used in SSA. However, such tools can have positive impacts on farmers’ livelihoods and on their adoption of productivity-enhancing technology, methods, and inputs.<sup>1078</sup> The main benefit of crop insurance for the agricultural system as a whole is increased reliability of supply of the agricultural products that are covered by the insurance. For farmers, having insurance can reduce the need to rely on detrimental coping mechanisms in response to an adverse shock, such as selling productive assets or removing children from school. With an insurance payout, farmers can meet basic needs without selling assets.

The main barrier in SSA to the adoption of risk management tools such as crop insurance is the high cost of supplying insurance. For example, indemnity-based insurance is one type of crop insurance that pays out to a farmer when there is verifiable damage to the farmer’s crop from an insured event.<sup>1079</sup> While indemnity-based crop insurance is commonly used by farmers in developed economies, there are

<sup>1077</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1078</sup> To compensate for a lack of formal risk management mechanisms, farmers often rely on informal ones, such as diversifying production and using “low risk/low reward” production techniques. When a shock does occur, farmers may be forced to sell productive assets and use other coping mechanisms that have negative long-term impacts. These informal risk management strategies and coping mechanisms for shocks serve to disincentivize investment in higher-yielding technologies and inputs, such as improved seed varieties and fertilizers. Ahmed, McIntosh, and Alexandros, *The Impact of Commercial Rainfall Index Insurance*, 2017; Dercon, “Risk, Insurance, and Poverty: A Review,” in Dercon, *Insurance against Poverty*, 2005.

<sup>1079</sup> Iturrioz, *Agricultural Insurance*, 2009.

challenges that make it too costly for insurance providers to offer this approach to smallholders in developing countries such as Kenya.

On the supply side, it is expensive to send a claims inspector to numerous small farms to verify their losses (in Kenya, farms under 5 hectares make up 72 percent of agricultural land).<sup>1080</sup> This forces insurance providers to charge high premiums. Even for farmers who can afford the high premiums, it is only attractive to farmers facing high risks of crop loss.<sup>1081</sup> This phenomenon is called adverse selection and further raises the costs of supplying insurance. Additional costs to the insurer stem from insured farmers losing the incentive to use best practices to produce a quality crop because they do not bear the risk (a phenomenon called moral hazard).<sup>1082</sup> On the demand side, the cost of buying insurance is a major disincentive for smallholders.<sup>1083</sup> This is especially true when many farmers lack funds at the beginning of the growing season to purchase expensive insurance in addition to their seeds and other inputs.<sup>1084</sup> Additionally, many smallholders are not aware of the need for and the benefits of insurance.<sup>1085</sup>

A specific type of insurance—index crop insurance—is increasingly seen as a viable risk management tool in developing countries. Unlike indemnity insurance, which only pays out on verified claims of crop losses and therefore is relatively expensive, index insurance pays out to policyholders when a preset and objective measure that is linked to production, like rainfall, falls below a specific threshold.<sup>1086</sup> Weather stations and satellites are often used to collect data, which are used to forecast and calculate risk for the underwriters and verify policyholders' losses without the need to send out inspectors. This insurance structure reduces disagreement over what constitutes a loss, and creates an incentive for farmers to use best practices under adverse growing conditions because they can get a payout even if they still produce a crop.<sup>1087</sup> The increased efficiencies make index crop insurance less costly for insurers to provide, which increases the demand for crop insurance among smallholders.

Index-based crop insurance has several additional benefits. It can increase the reliability of supply by incentivizing the adoption of and investment in higher-yielding production methods. With insurance, farmers will get a payout if their investment in improved maize seeds does not produce a crop due to a drought, so there is less need to save seeds in case of a poor harvest. With insurance, it makes more sense to invest in fertilizers and tillage, because those investments are covered in case of crop loss. This increased adoption of higher-yielding production technologies and methods can lead to increased yields

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<sup>1080</sup> Birch, *Agricultural Productivity in Kenya*, 2018; Jensen and Barrett, *Agricultural Index Insurance for Development*, 2017; Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1081</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1082</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1083</sup> Jensen and Barrett, *Agricultural Index Insurance for Development*, 2017.

<sup>1084</sup> Sibiko, Veettil, and Qaim, *Small Farmers' Preferences for Weather Index Insurance*, 2018.

<sup>1085</sup> Jensen and Barrett, *Agricultural Index Insurance for Development*, 2017.

<sup>1086</sup> Sibiko, Veettil, and Qaim, *Small Farmers' Preferences for Weather Index Insurance*, 2018.

<sup>1087</sup> For instance, low rainfall recorded by a weather station may trigger an index insurance payout, but with the use of best practices or simply luck, a farmer may have been able to still produce a crop despite the lack of rain. That farmer will get the money from the insurance payout and as well as whatever they are able to harvest and sell. Sibiko, Veettil, and Qaim, *Small Farmers' Preferences for Weather Index Insurance*, 2018.

and agricultural productivity. For countries like Kenya, this approach can lead to a decrease in imports of crops like maize and an increase in exports of cash crops.

## Market

Index insurance has been used across SSA, including in Kenya, Uganda, Tanzania, Nigeria, Ethiopia, Burundi, Malawi, Ghana, and Rwanda, and covers crops ranging from staples like maize, wheat, and livestock to cash crops like tea and coffee.<sup>1088</sup> It has mostly been provided via pilot programs.<sup>1089</sup> One example is Agriculture and Climate Risk Enterprise (ACRE), a private for-profit company in Kenya. ACRE originated as a pilot program funded by the U.S.-based Syngenta Foundation; this project, tied specifically to rainfall, was called Kilimo Salama.<sup>1090</sup> In 2014, the program became ACRE, a service company that works with stakeholders, including farmers, input suppliers, governments, and insurance companies, to develop and provide index insurance products to smallholder farmers across East Africa. ACRE provides insurance for maize, sorghum, coffee, sunflowers, wheat, cashews, and potatoes.<sup>1091</sup>

Maize is the main staple food crop in Kenya, representing 65 percent of daily caloric intake.<sup>1092</sup> Forty percent of Kenya's total crop area is used to grow maize, with smallholders farming three-quarters of that area.<sup>1093</sup> From 2016 to 2019, Kenya produced an average 3.5 million metric tons (mt) of maize per year on 2.2 million ha.<sup>1094</sup> Yields averaged 1.59 mt/ha from 2016 to 2019, one-seventh the size of yields in the United States and 19 percent lower than maize yields for SSA as a whole.<sup>1095</sup> Major constraints to increasing maize yields in Kenya include the lack of credit; lack of improved seed varieties, particularly drought-tolerant varieties; and low rates of fertilizer application.<sup>1096</sup> Kenya is a net importer of maize, with imports increasing in years of poor domestic production.<sup>1097</sup> Nearly all of Kenya's agricultural production is rainfed, with changes in weather patterns having a significant impact on yields.<sup>1098</sup>

In recent years, Kenyan farmers have faced a number of risks including pests, disease, and weather. In many parts of SSA, agricultural production is becoming more uncertain due to changing rainfall patterns.<sup>1099</sup> Since 2010, Kenya has experienced three droughts.<sup>1100</sup> After a drought, it reportedly takes

<sup>1088</sup> ACRE, "Our Achievements" (accessed October 15, 2019); Pula Advisors, "FAQ" (accessed October 15, 2019); WorldCover, "Home" (accessed October 18, 2019).

<sup>1089</sup> Njue, Kirimi, and Mathenge, *Uptake of Crop Insurance among Smallholder Farmers*, 2018.

<sup>1090</sup> Kilimo Salama is Kiswahili for "Safe Agriculture."

<sup>1091</sup> ACRE, "Our Achievements" (accessed October 15, 2019).

<sup>1092</sup> This report defines maize as classified in the international Harmonized System (HS) subheading 1005, which includes seed and non-seed maize. USDA, FAS, *Kenya: Grain and Feed Annual*, March 21, 2017; Mohajan, *Food and Nutrition Scenario of Kenya*, 2014.

<sup>1093</sup> Abate, *Maize in Kenya: Chance for Getting Back to Former Glory?* 2015.

<sup>1094</sup> For comparison, the United States produced an average 374.1 million mt per year on 33.9 million acres. USDA, PSD Online database (accessed October 20, 2019).

<sup>1095</sup> USDA, PSD Online database (accessed October 20, 2019).

<sup>1096</sup> Abate, *Maize in Kenya: Chance for Getting Back?* 2015.

<sup>1097</sup> Abate, *Maize in Kenya: Chance for Getting Back?* 2015; USDA, FAS, *Kenya: Grain and Feed Annual*, March 21, 2017; FAO, FAOSTAT Statistical Database (accessed September 27, 2019).

<sup>1098</sup> Sibiko, Veettil, and Qaim, *Small Farmers' Preferences for Weather Index Insurance*, 2018.

<sup>1099</sup> Economist, "Paying for Rain," December 15, 2018.

<sup>1100</sup> Sengupta, "Hotter, Drier, Hungrier," March 12, 2018; Relief Web, "Kenya: Drought – 2014–2019," 2019.

two or three growing seasons for farmers to recover their incomes fully, seriously harming the agricultural economy.<sup>1101</sup> Current efforts to manage risk through crop insurance in Kenya include both indemnity and index insurance. Indemnity insurance is mainly targeted at medium-sized and large commercial farms,<sup>1102</sup> while index insurance is typically targeted at smaller farms.

In 2009, ACRE established its first pilot program to protect wheat and maize farmers from the consequences of too much and too little rainfall by using data from a network of weather stations to determine if a payment has been triggered. The program set the cost to insure one acre of maize at approximately \$37, which is roughly 10 percent of the value of harvest for an individual farmer.<sup>1103</sup> The scheme operated so that if the rates of rainfall at a predetermined weather station crossed a preset maximum or minimum level (based on the agronomic needs of the insured crop), a payment was sent to the mobile phone of each insured farmer using that weather station.<sup>1104</sup> This project was the first to use mobile phones to administer an index insurance product.<sup>1105</sup> ACRE has grown to become the largest provider of index insurance in SSA and the largest company outside of developed economies in which insurance premiums are not subsidized but reflect the market rate.<sup>1106</sup>

## Adoption

One of the main drivers of the adoption of ACRE's index insurance products has been its ability to adapt the concept of index insurance to local conditions. The company was the first to use mobile phones and payments to administer policies, making it easier for people to sign up and receive payments when they are most needed.<sup>1107</sup> When ACRE found that farmers were struggling with affording the larger, more expensive policies, the firm adapted its product offerings accordingly. These adapted products include Bima Pima, which allows people to choose the level of insurance they want or can afford, and the Replanting Guarantee, which provides a policy option for a smaller segment of the growing season by insuring a bag of seeds during planting and germination.<sup>1108</sup> To help their policyholders get the most benefit from the product, ACRE collaborated with other organizations to provide access to credit and advisory services.

Another factor driving the adoption of index crop insurance is the way certain widely available technologies can facilitate the operation of index insurance. Mobile technology and mobile payment systems that are commonly used by farmers facilitate the administration of index insurance schemes and help reduce the overhead costs of providing insurance.<sup>1109</sup> Advances in computing technology have also helped drive the spread of index insurance. Increases in computing power, and a reduction in the costs of providing data storage, including cloud-based services, have made it possible for companies like ACRE to process and analyze the data needed to establish and monitor an index in a cost-effective

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<sup>1101</sup> Sengupta, "Hotter, Drier, Hungrier," March 12, 2018; Relief Web, "Kenya: Drought – 2014–2019," 2019.

<sup>1102</sup> Oxford Business Group, *Kenya Offers a Range of Options*, 2017.

<sup>1103</sup> World Bank, *Agriculture and Climate Risk Enterprise (ACRE): Kilimo Salama* (accessed August 22, 2019).

<sup>1104</sup> The size of the payment is calculated according to how much the rainfall has crossed the trigger value.

<sup>1105</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1106</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1107</sup> Sibiko, Veettill, and Qaim, *Small Farmers' Preferences for Weather Index Insurance*, 2018.

<sup>1108</sup> ACRE, "Our Achievements" (accessed October 15, 2019).

<sup>1109</sup> Iturrioz, *Agricultural Insurance*, 2009.

way.<sup>1110</sup> This allows insurance companies to incorporate data from new public and private sources, like satellites. Index insurance schemes can also use innovative technology such as machine learning and blockchain to analyze data and administer payments.<sup>1111</sup>

While index insurance removes the issues of moral hazard and adverse selection, it does create a new barrier to the adoption of insurance, called “basis risk.” This phenomenon denotes a situation in which an insured event occurs and farmers experience losses, but payments are not triggered.<sup>1112</sup> This is fundamentally a data problem: either there are not enough data points to register the event, or the index is not an effective proxy for the adverse event the insurance is supposed to cover.<sup>1113</sup> One solution is to increase the data points used to monitor the index; for example, investing in new weather stations in the coverage area can provide the granularity needed to match on-farm events with adverse weather events. But this is not a quick solution, because at least 10 years of historical data at the stations are typically needed for proper forecasting.<sup>1114</sup> Satellite imagery can also be used, but this may not have the resolution required.<sup>1115</sup> ACRE has been trying to overcome these issues by partnering with the Kenyan Meteorological Service and the Ministry of Agriculture to improve the design of the indices used to measure risk.<sup>1116</sup> These indices are supported by multiple sources of data, including weather stations, satellite data for rainfall and vegetation cover, and government yield data.<sup>1117</sup>

Despite these challenges, ACRE has expanded its customer base and product offerings in East Africa. In 2013, ACRE covered 200,000 farmers across Kenya, Rwanda, and Tanzania;<sup>1118</sup> by 2018, it had grown to 1.7 million farmers, totaling \$181 million in coverage for a variety of crops and livestock that year.<sup>1119</sup> ACRE’s experience suggests several key factors are needed to spur the adoption of crop insurance, including the adaptation of the index-based model to local conditions and the use of new technologies to improve the delivery of insurance products.

## Results

While index-based insurance is relatively new and still not yet widely adopted, the evidence suggesting that it can have significant positive impacts on farmers is likely to make it an attractive form of income protection for SSA farmers. These impacts include increased farm investment, higher earnings, and

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<sup>1110</sup> CCAFS, “Climate Services and Safety Nets: Index-based Insurance” (accessed October 10, 2019); Iturrioz, *Agricultural Insurance*, 2009.

<sup>1111</sup> Bird, “‘Smart’ Insurance Helps,” December 4, 2018.

<sup>1112</sup> Hazell et al., *The Potential for Scale and Sustainability*, 2010.

<sup>1113</sup> Jensen and Barrett, *Agricultural Index Insurance for Development*, 2017.

<sup>1114</sup> Global Index Insurance Facility, *Agriculture and Climate Risk Enterprise (ACRE)* (accessed October 20, 2019); Hazell, et al, *The Potential for Scale and Sustainability*, 2010.

<sup>1115</sup> Hazell et al., *The Potential for Scale and Sustainability*, 2010; Feed the Future Innovation Lab, “How Agricultural Index Insurance Can Promote Risk Management,” April 25, 2019.

<sup>1116</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015, 12; Adegoke et al., “Improving Climate Risk Transfer and Management for Climate-Smart Agriculture,” October 2017, 23.

<sup>1117</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015, 12.

<sup>1118</sup> ACRE, “Our Achievements” (accessed October 15, 2019); Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1119</sup> ACRE, “Our Achievements” (accessed October 15, 2019).

increased adoption of new technologies. Farmers insured by ACRE have invested 19 percent more in their operations than their uninsured peers<sup>1120</sup> and have incomes that are 16 percent higher.<sup>1121</sup> This in turn serves to improve the reliability of food supply in Kenya by increasing yields and reducing their variability.

Some research suggests that farmers are using index insurance in place of traditional risk management techniques such as production diversification,<sup>1122</sup> and this allows farmers to take advantage of economies of scale and produce more efficiently. This not only frees up resources to focus on one crop, but also channels investment into that crop. One study indicated that having index crop insurance can increase investment by smallholder farmers by 20 to 30 percent.<sup>1123</sup>

Research also suggests that index insurance can significantly improve adoption of new technologies, particularly those that may have a higher upfront cost but can have higher payback than traditional methods, such as purchasing hybrid seeds rather than saving and replanting traditional seeds. Increased adoption rates of such new technologies, including mechanization (see box 6.2), have been found to be as high as 80 percent for those with insurance compared to those with no insurance, though these adoption rates depended on how well the insurance covers the risk.<sup>1124</sup>

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<sup>1120</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1121</sup> Greatrex et al., *Scaling Up Index Insurance for Smallholder Farmers*, 2015.

<sup>1122</sup> Sibiko, Veettil, and Qaim, *Small Farmers' Preferences for Weather Index Insurance*, 2018.

<sup>1123</sup> Bird, "'Smart' Insurance Helps," December 4, 2018.

<sup>1124</sup> Carter, Cheng, and Sarris, *Where and How Index Insurance Can Boost*, 2016.

**Box 6.2** Innovative Mechanization Solutions in SSA Agriculture

Mechanization, including the use of tractors, harvesters, and other equipment, has been identified as a key priority in developing agricultural productivity in sub-Saharan Africa (SSA). Hello Tractor is a firm that provides an innovative method for increasing access to mechanized equipment. The firm is headquartered in Abuja, Nigeria, but works across several SSA countries<sup>a</sup> to provide a digital platform. Hello Tractor's platform connects independent tractor owners (primarily investors) with small farmers who do not necessarily have the capital to buy machinery for their operations. The platform allows these farmers to request and purchase tractor services while using Global Positioning System (GPS) technology to track equipment. Hello Tractor also works with banks to help finance the purchase of tractors by investors, and the firm works with dealers to ensure tractor maintenance.<sup>b</sup> A large portion of Hello Tractor's investment comes from the United States, but investment is also sourced from Nigeria and other SSA markets.<sup>c</sup>

The key benefit of mechanization for smallholders is lowering unit production costs by increasing yields. When using a service such as Hello Tractor, the cost of plowing fields using tractors is around \$60–\$70 per hectare, roughly one-third of the cost of labor to plow the same amount of land without machinery. Additionally, the yield from plowed fields can be as much as three to seven times higher than the yield from an unplowed field, further reducing per-unit production costs.<sup>d</sup>

<sup>a</sup> Hello Tractor is active in Kenya, Mozambique, Senegal, and Tanzania, and operates in nine countries across the African continent, managing over 15,000 tractors. Industry representative, telephone interview by USITC staff, July 9, 2019.

<sup>b</sup> *Hello Tractor*, "About Us" (accessed November 27, 2019).

<sup>c</sup> Investment is through public-private partnerships with companies such as John Deere and the Nigerian Federal Ministry of Agricultural and Rural Development. Foote, "Meet the Social Entrepreneur Behind Africa's 'Uber for the Farm,'" August 14, 2018. An industry representative also mentioned that the U.S. government has also provided support through grants from the U.S. Agency for International Development. Industry representative, telephone interview by USITC staff, July 9, 2019.

<sup>d</sup> Industry representative, telephone interview by USITC staff, July 9, 2019; industry representative, interview by USITC staff, Washington, DC, August 7, 2019.

There is broad consensus that index insurance is most successful when provided as part of a bundle of additional information and resources, such as access to credit, access to new technology, and advisory services.<sup>1125</sup> For the Kenyan market where ACRE operates, access to index insurance appears to have increased farmer income and investment, and in turn led to improved productivity and yields, leading to an increase in the reliability of supply. This can mean a reduction in maize imports and an ability for domestic producers to supply Kenya's increasing demand for animal feed, reflected in recent investments in feed processing plants in the country.<sup>1126</sup> For the more export-oriented crops that Kenya produces, such as tea and coffee, index crop insurance has the potential to help increase export performance.

## Further Application in SSA

The adoption of index insurance is likely to increase in the region. For example, ACRE is planning on expanding its offerings to five additional countries, and is developing new indices to cover more crops,

<sup>1125</sup> Carter, Cheng, and Sarris, *Where and How Index Insurance Can Boost*, 2016.

<sup>1126</sup> USDA, FAS, *Kenya: Grain and Feed Annual*, March 21, 2017.

such as tea.<sup>1127</sup> The company is also exploring new products that use new sources of data.<sup>1128</sup> One of these is “picture-based insurance,” in which farmers take a series of pictures of a portion of their crop at various stages of production that are then analyzed by a team of agronomists to determine loss.<sup>1129</sup> In the future, ACRE hopes to analyze the images using artificial intelligence<sup>1130</sup> to automate the process for determining payouts for different types of risk.

A wide range of approaches to providing this type of insurance are being applied across the region. In Ghana, the government has taken a market-oriented approach offering startup companies opportunities to grow. For example, WorldCover, a U.S.-based insurance firm, is providing index-based crop insurance to farmers and financing it via nontraditional sources such as venture capital.<sup>1131</sup> This strategy brings in additional capital to expand insurance coverage and allows investors to diversify their portfolios. In this approach, the insurance policies of many farmers are grouped together into a pool. Investors who buy into that pool receive a portion of the premiums the farmers pay into that pool, while the capital from the investors is used to pay farmers when the index triggers a payout.<sup>1132</sup>

In Nigeria, the government has taken a primary role in developing the crop insurance sector, collaborating with the International Finance Corporation (IFC) to increase the availability of index crop insurance in the country. The IFC’s Global Index Insurance Facility is working with Africa Re (Africa’s largest reinsurance company) in Nigeria to provide technical support to local insurance companies.<sup>1133</sup> This support assists these firms in building platforms for providing index insurance as well as developing indices for measuring risk to farmers. The goal of this partnership is to reduce the cost and risk taken on by insurers, thereby allowing them to charge lower premiums.<sup>1134</sup>

Despite alternatives offered in the region, initial results suggest that index insurance can play an important role in removing the constraints on agricultural production in some SSA countries, including use of traditional risk management techniques that reduce economies of scale, limited adoption of improved seed varieties, and low rates of fertilizer use. Index insurance has been shown to improve incomes, investment, and the adoption of higher-yielding technologies. By improving the reliability of supply over time, this tool can boost competitiveness and market opportunities for producers in the agriculture sector.

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<sup>1127</sup> World Bank, *Agriculture and Climate Risk Enterprise (ACRE): Kilimo Salama* (accessed August 22, 2019).

<sup>1128</sup> World Bank, *Agriculture and Climate Risk Enterprise (ACRE): Kilimo Salama* (accessed August 22, 2019).

<sup>1129</sup> ACRE, “Our Achievements” (accessed October 15, 2019).

<sup>1130</sup> ACRE, “Our Achievements” (accessed October 15, 2019).

<sup>1131</sup> Bright, “WorldCover Raises \$6M Round for Emerging Markets’ Climate Insurance,” May 3, 2019. U.S. insurers primarily provide crop insurance to the domestic market and are not major providers of crop insurance to SSA, while U.S. firms that are involved in SSA tend to be smaller startups (like World Cover). AIG Worldwide, a large U.S. insurance firm, does provide insurance through affiliates in Kenya, South Africa, and Uganda but primarily focuses on personal and business-related insurance lines. AIG Worldwide, <https://www.aig.com/worldwide#005> (accessed February 6, 2020).

<sup>1132</sup> Curriston, “An Alternative Investment with WorldCover,” July 19, 2017.

<sup>1133</sup> Reinsurance is essentially insurance for insurance companies that is used to spread the risk of paying a large obligation resulting from an insurance claim. Ben-hutta, “Africa Re to Develop Agricultural Insurance in Nigeria,” April 2019.

<sup>1134</sup> Insurance Journal, “Africa Re Joins World Bank’s IFC,” March 29, 2019.

# Chapter 7

## The Digital Economy in SSA

### Overview of the Digital Economy in SSA

This chapter examines the digital economy<sup>1135</sup> in sub-Saharan Africa (SSA). The first part gives an overview of recent industry developments, including the role of U.S. firms in providing digital products and services; national and regional policies; and macroeconomic factors that affect digital trade. It also highlights how the adoption of these technologies affects other industry sectors in SSA.

The second part of this chapter contains five case studies that cover a broad selection of digital services ranging from ICT infrastructure and enabling services to products used by consumers. Each case study in this chapter presents an overview of the market for each service (including the role of U.S. firms in supplying it), describes how this service affects other sectors, and examines national and regional policy measures and macroeconomic factors that affect the supply of and demand for the service. Four of these case studies (cloud computing, e-commerce, digital video streaming, and Internet of Things technologies) cover sectors identified in the request letter, while one case study (financial technology) describes a sector where U.S. firms are highly competitive globally and have made inroads into the SSA market.<sup>1136</sup> Out of the seven key SSA markets mentioned in the request letter, these case studies illustrate digital sectors in five countries (South Africa, Nigeria, Kenya, Ghana, and Rwanda).

The first case study examines the market for cloud infrastructure as a service (IaaS) in South Africa, where U.S. firms are beginning to build large data centers that will allow both foreign and domestic firms to distribute their software and other digital services more efficiently. The second case study, on financial technology, explores an area where some SSA firms are global leaders and U.S. firms are significant investors and providers of infrastructure. The third case study focuses on e-commerce, which is a fast-growing sector in SSA. Although U.S. firms are not currently very active in SSA in this sector, the development of local e-commerce platforms offers the potential to link African consumers with U.S. products that are currently unavailable locally. The fourth case study considers the digital video-streaming sector where U.S. firms are market leaders in SSA and are facilitating the creation and distribution of African video content to new audiences online. Finally, the fifth case study examines two applications of Internet of Things (IoT) technologies: drone delivery services and smart cities technologies.

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<sup>1135</sup> The digital economy refers to the delivery of services over the internet by firms in any industry sector, and of associated goods such as smartphones and internet-connected devices. For a broader discussion of the digital economy, see USITC, *Global Digital Trade 1: Market Opportunities*, August 2017.

<sup>1136</sup> An application of blockchain technology, also mentioned in the USTR's request letter, is discussed in the case study 6.2 in chapter 6, which examines the technology's potential role in the cocoa supply chain.

## Key Findings

New technologies are transforming the way people live and businesses operate in SSA. However, adoption, trade, and investment related to these technologies varies widely across SSA countries and sectors. With mobile phones as the primary means of internet access in SSA, the number of people in SSA using the internet, especially high-speed internet, has grown rapidly in recent years, though the level of access varies widely by country.<sup>1137</sup> In addition to increased internet access and speed, growth in the digital economy in SSA has been driven by rising economic growth and consumer spending power, as well as a growing urban population. Industry representatives argue that certain policies can hinder U.S. trade and investment in the digital economy, particularly restrictions on the cross-border transfer of data (which affects all sectors) and restrictions on obtaining government licenses (which primarily affects sectors like financial services and telecommunications).

By contrast, policies that put regulatory frameworks in place for e-commerce or protect data privacy can help facilitate trade and investment. Adoption of digital technologies is also changing traditional services and manufacturing sectors by making firms more productive, improving cost competitiveness, creating new distribution channels for products and services, and reaching new customers. While U.S. firms are the leading global suppliers of many of these technologies, they have not established a strong market presence in SSA. In part, U.S. firms' lack of presence is due to the fragmented nature of SSA markets as well as to the highly specific local knowledge often required to operate in these markets. Instead, because they are global technology leaders, U.S. firms in many cases provide the infrastructure or investment that facilitates the creation and distribution of these products rather than providing the products themselves. Table 7.1 lists the key findings from each case study in this chapter.

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<sup>1137</sup> See appendix H for a more in-depth discussion of internet connectivity in SSA.

**Table 7.1** Key findings of case studies on SSA’s digital economy

<b>Industry</b>	<b>Countries of focus</b>	<b>U.S. firm involvement</b>	<b>How adoption affects other sectors</b>	<b>Policies and market conditions</b>
Cloud computing	South Africa, Nigeria	Microsoft is the only provider of infrastructure as a service (IaaS) sited in SSA, with a large-scale data center in South Africa. Other U.S. IaaS providers also access firms in SSA from outside the region in SSA countries where internet infrastructure is sufficiently developed.	IaaS creates an ecosystem of software and app developers to build new products on the IaaS network and sell them into SSA markets. Cloud IaaS also provides the processing power needed to support Internet of Things devices, by aggregating and processing data from multiple devices.	Data localization requirements present a challenge to cloud IaaS services by fragmenting the global network on which IaaS providers depend.
Financial technology (fintech)	Nigeria, Kenya, other SSA countries	U.S. firms provide some financial services directly to SSA, but they more often invest in, or form partnerships with, SSA firms in the fintech sector.	Fintech benefits people in SSA by increasing financial inclusion and facilitating domestic and cross-border transfers of money, which also facilitate many other types of businesses that require secure payment systems and access to credit.	Complex financial and telecom regulations affect fintech in SSA. These regulations differ significantly between countries, which hinders adoption in some markets.
E-commerce	South Africa, Nigeria	U.S. firms supply a small amount of cross-border e-commerce services, but are not yet major players in SSA.	E-commerce connects sellers (including small and medium-sized enterprises) to buyers, facilitating the supply of new products to markets. It also provides opportunities for logistics and delivery services.	Deficiencies in delivery logistics and payments, including a lack of supporting services that facilitate e-commerce, are a significant impediment, giving rise to the unique business model currently employed by domestic SSA firms to address these deficiencies.
Digital streaming video	South Africa, Nigeria	U.S. firms like Netflix and YouTube are major suppliers of digital video in different market segments.	Video-on-demand streaming is changing the video and film market throughout SSA and displacing DVDs and video compact discs (VCDs) as a key distribution and consumption channel.	Slow loading speeds and high data costs have been a major barrier for streaming services in SSA. Copyright infringement and piracy are also problematic for creating and distributing video.
Internet of things	Rwanda, Ghana	One U.S. firm, Zipline, is the predominant provider of drone delivery services in SSA, and U.S. firms also supply “smart cities” technologies to SSA governments.	Drone delivery services allow health services to provide more timely access to critical medical supplies. Smart cities technologies enable SSA markets to deliver key municipal services more efficiently.	Navigating current regulations and acquiring waivers for drone delivery services remains a challenge; integrating smart cities technologies with other government initiatives is also challenging for firms.

Source: Compiled by USITC.

## Overview of Digital Trade and Investment in SSA

While there are no official trade statistics that completely encapsulate digital trade, the World Trade Organization (WTO) does track total trade in services sectors that make up key components of the digital economy. Data on total SSA cross-border imports of telecommunications, computer, and information services from the world are not available for several key markets. However, total imports of these services by Kenya and South Africa both grew from 2012 to 2017, at a compound annual growth rate (CAGR) of 23.4 percent and 5.8 percent, respectively, for those countries (figure 7.1).<sup>1138</sup> Nigerian imports of these services peaked in 2014 at \$1.5 billion but declined thereafter,<sup>1139</sup> possibly influenced by the devaluation of the Nigerian currency in 2016 and the recession that followed.<sup>1140</sup> Total African imports of these services from the United States also declined from 2012 to 2018. These imports fell from \$788 million in 2012 to \$636 million in 2017 before rebounding slightly to \$668 million in 2018 (a CAGR of -2.7 percent for 2012–18), with Nigerian imports falling 3.0 percent and South African imports remaining relatively unchanged.<sup>1141</sup> A similar trend is visible using a slightly broader measure of digital trade: African imports of ICT services from the United States, which includes telecommunications, computer and information services, as well as trade in intellectual property related to computer software. These imports fell somewhat faster (-6.0 percent) over the same period.<sup>1142</sup>

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<sup>1138</sup> Data for Côte d'Ivoire are unavailable for 2012. However, imports of telecommunications, computer, and information services by Côte d'Ivoire from the world grew 25.5 percent from 2013 to 2017.

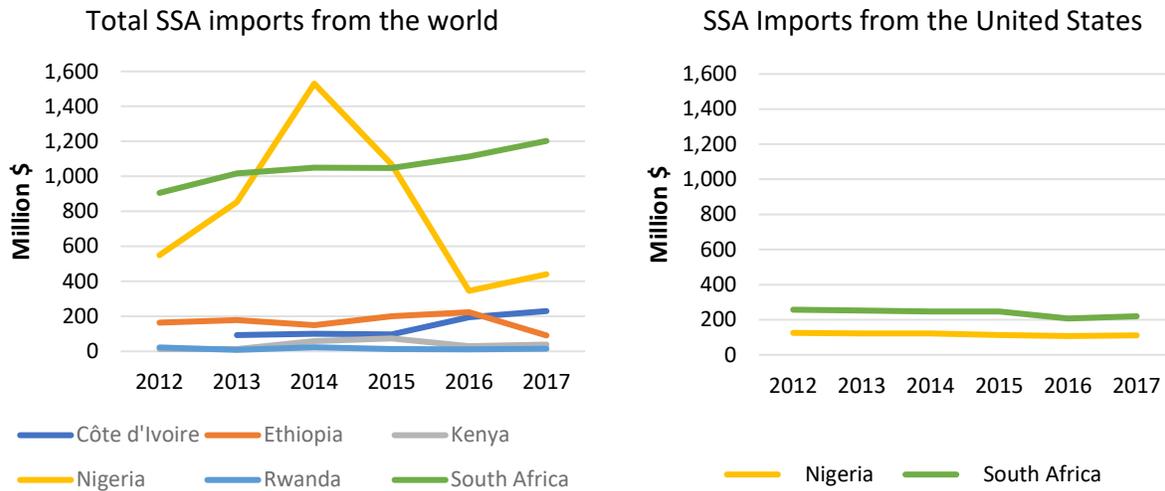
<sup>1139</sup> WTO, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed January 22, 2020).

<sup>1140</sup> Wallace, "Nigeria's Central Bank Finally Throws in Towel," June 15, 2016; Kazeem, "Nigeria Has Now Been in Recession," May 23, 2017.

<sup>1141</sup> USDOC, BEA, International Services Tables, table 4.4 (accessed November 13, 2019). The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce does not publish data on U.S. cross-border services trade with SSA, only Africa as a whole. Africa includes SSA as well as Egypt, Libya, Algeria, Morocco, Tunisia, Western Sahara, and outlying islands. See USDOC, BEA, "Geographic Area Definitions," n.d.

[https://apps.bea.gov/international/bp\\_web/geographic\\_area\\_definitions.pdf](https://apps.bea.gov/international/bp_web/geographic_area_definitions.pdf) (accessed August 8, 2019).

<sup>1142</sup> USDOC, BEA, International Services Tables, table 4.4 (accessed November 13, 2019).

**Figure 7.1** SSA imports of telecommunications, computer, and information services by key market, 2012–17

Source: WTO, Time Series on International Trade, “Trade in Commercial Services, 2005–onward (BOP6)” (accessed August 12, 2019); USDOC, BEA, International Services Tables, table 4.4 (accessed January 22, 2020).

Notes: Data for 2018 are unavailable for total SSA imports. Data for Ghana are unavailable for total imports. Data for Côte d'Ivoire's imports from the world are unavailable for 2012. Data for imports from the United States are available only for Nigeria and South Africa. See appendix table I.7 for a tabular presentation of the data in this figure.

Total SSA exports of telecommunications, computer, and information services to the world grew from \$2.9 billion in 2012 to \$3.7 billion in 2017 (a CAGR of 12.5 percent).<sup>1143</sup> Of the key SSA markets, South Africa accounted for 18.1 percent of these exports (\$665 million), while Kenya accounted for 12.9 percent (\$473 million) in 2017. Exports from South Africa, Nigeria, Côte d'Ivoire, and Rwanda all grew during this period, while exports from Ethiopia fell and those from Kenya remained virtually unchanged. However, exports of these services by all of Africa (including North Africa)<sup>1144</sup> to the United States declined by 13.8 percent over the same period. The decline was driven by a fall in exports from South Africa.<sup>1145</sup>

While many digital services can be supplied cross-border due to their intangible nature, other digital services are likely supplied by foreign-owned affiliates operating in SSA.<sup>1146</sup> Data for U.S. foreign affiliate

<sup>1143</sup> The earliest year for which data were available was 2012, while 2017 is the latest year for which they were available for the majority of key SSA markets. WTO, Time Series on International Trade, “Trade in Commercial Services, 2005–onward (BOP6)” (accessed January 22, 2020).

<sup>1144</sup> The Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce does not publish data on U.S. cross-border services trade with SSA, only Africa as a whole. Africa includes SSA as well as Egypt, Libya, Algeria, Morocco, Tunisia, Western Sahara, and outlying islands. See USDOC, BEA, “Geographic Area Definitions,” n.d. [https://apps.bea.gov/international/bp\\_web/geographic\\_area\\_definitions.pdf](https://apps.bea.gov/international/bp_web/geographic_area_definitions.pdf) (accessed August 8, 2019).

<sup>1145</sup> USDOC, BEA, International Services Tables, table 4.4 (accessed November 13, 2019). For more on ICT-enabled services, see USDOC, BEA, International Services Tables, tables 3.1 and 3.3 (accessed November 13, 2019).

<sup>1146</sup> An example of a service supplied by a foreign-owned affiliate operating in SSA would be a foreign telecommunications firm that opens an office in an African country to provide service to that country's local market.

sales of telecommunications, computer, and information services in SSA are not available. However, available data for sales of information services (a broad category including publishing, telecommunications, broadcasting, and data processing) by foreign affiliates of U.S. firms to Africa show a total of \$886 million in 2017 (the latest year available), up from \$710 million in 2015. Data on most subsectors of information services related to digital trade are suppressed by BEA to avoid disclosing firm information, as are total U.S. purchases of information services supplied by African-owned affiliates.<sup>1147</sup>

FDI in the SSA digital economy is difficult to measure on an annual basis,<sup>1148</sup> but FDI from the United States made up a significant share of total flows during 2016–18. Using project level data, greenfield investment in the SSA communications, software, and information technology (IT) services sector from all source markets totaled \$6.9 billion from 2016 to 2018, with FDI from the United States making up about 43 percent (\$3.0 billion) of that total. The largest destination for U.S. FDI in both sectors during this period was South Africa (\$1.4 billion or 46 percent of U.S. FDI in SSA), followed by Nigeria (\$900 million or 32 percent) (figure 7.2).<sup>1149</sup> This type of FDI, however, does not cover the smaller portfolio or venture capital investments that are a key funding source for many new digital firms.<sup>1150</sup> By one metric, funding from all source markets for technology-focused startups in Africa as a whole grew to \$725.6 million in 2018, a 300 percent increase from 2017.<sup>1151</sup> The largest subsector receiving this type of funding was financial technology (\$284.6 million), while e-commerce received \$97.7 million.<sup>1152</sup> Another report estimated that technology startups in all sectors in Africa garnered over \$1.2 billion of venture capital investment in 2018,<sup>1153</sup> while a third report estimated that funding for technology-focused startups in Africa totaled \$1.3 billion in 2019.<sup>1154</sup>

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<sup>1147</sup> USDOC, BEA, International Services Tables, table 4.4 (accessed October 15, 2019).

<sup>1148</sup> Project level FDI flows in the SSA digital economy that are recorded on an annual basis tend to be volatile, as they represent the entire capital value of a project based on the date it was announced, not the date when the capital flow occurred. For more information on FDI in SSA, see chapter 4. *Financial Times*, fDi Markets database, “Frequently Asked Questions (FAQs)” (accessed November 18, 2019).

<sup>1149</sup> *Financial Times*, fDi Markets database (accessed November 18, 2019).

<sup>1150</sup> The fDi Markets database only covers greenfield investments and joint ventures which lead to new operations.

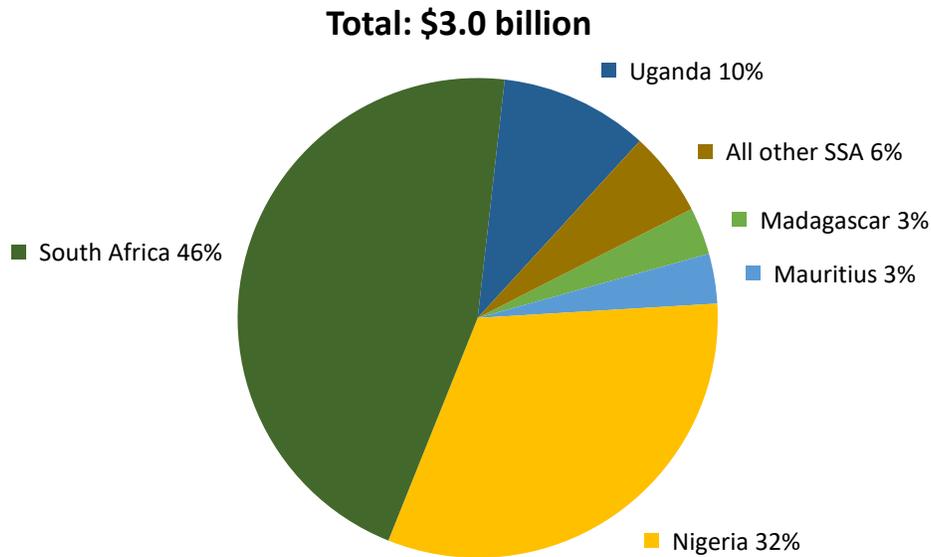
<sup>1151</sup> Weetracker, “African Venture Capital 2018 report,” January 4, 2019.

<sup>1152</sup> Kazeem, “Startup Investment in Africa,” January 11, 2019.

<sup>1153</sup> Collon and Dème, “2018 Was a Monumental Year,” March 22, 2019.

<sup>1154</sup> Briter Bridges, “Africa’s Funding Landscape,” December 2019.

**Figure 7.2** U.S. greenfield investment in communications, software, and information technology services in SSA by market, cumulative 2016–18



Source: *Financial Times*, fDi Markets database (accessed November 18, 2019).

Notes: fDi Markets tracks announcements of new capital investment, though this data may reflect the intentions of firms rather than completed investments. It also provides information only on greenfield investment and joint ventures that lead to a new physical operation. FAO, “Methodology and Scope of the Data” (accessed November 29, 2019). See appendix table I.8 for a tabular presentation of the data in this figure.

U.S. firms are also increasing their presence in SSA in other ways, including by opening research hubs and incubators to build digital products and services that better serve SSA’s needs and tap local talent. IBM’s research arm opened its first African office in Nairobi, Kenya, in 2013, followed by a second in Johannesburg, South Africa, in 2016.<sup>1155</sup> In addition to being the predominant search engine in SSA,<sup>1156</sup> Google also opened a lab for developing artificial intelligence solutions in Accra, Ghana, in 2019.<sup>1157</sup> Similarly, in 2019, Microsoft spent \$100 million to open two development centers for software engineering—in Nairobi and in Lagos, Nigeria.<sup>1158</sup> While several of these firms have sold their core services in various SSA countries for at least a decade, the new research centers focus on growing areas such as healthcare, fintech, and agriculture. Africa is also the world’s fastest-growing region for software

<sup>1155</sup> Hao, “The Future of AI Research Is in Africa,” June 21, 2019. For a more detailed list of technology hubs in SSA, see World Bank, *World Development Report 2016*, 2016, 230.

<sup>1156</sup> Google had 97 percent of the search engine market in Africa as of October 2019, followed by the Chinese multinational company Baidu and other U.S. firms. Google also had at least a 95 percent market share in each key SSA market, typically followed by Bing from Microsoft. No key SSA market had a non-U.S. search engine firm with a market share above 1 percent. GlobalStats, “Search Engine Market Share” (accessed November 19, 2019).

<sup>1157</sup> Kennedy, “The Future of AI,” February 19, 2019.

<sup>1158</sup> Microsoft, “Furthering Our Investment in Africa,” May 13, 2019; Miriri, “Microsoft to Spend \$100 Million,” May 14, 2019.

developers (based on data from online code repository GitHub),<sup>1159</sup> and these centers assist U.S. firms in recruiting people in SSA with digital expertise without requiring them to immigrate to the United States.

## How the Adoption of Digital Technologies Affects Other Sectors

Digital technology has the potential to affect other industries in myriad ways, including making firms more productive, improving firms' competitiveness, and creating new distribution channels for products and accessing new customers. According to one study, firms in Africa that use the internet have on average 3.7 times higher labor productivity and 35 percent higher total factor productivity than firms that do not use the internet.<sup>1160</sup> These firms also had higher sales per worker and performed better on measures of product innovation.<sup>1161</sup> However, internet use by firms in the countries studied varied widely. Of manufacturing and service firms with at least five employees, the proportion of those using the internet ranged from 22 percent in Tanzania to 73 percent in Kenya. Similarly, the percentage of manufacturing or service firms which sold goods online with access to the internet ranged from 29.9 percent in Ghana to 68.4 percent in Tanzania.<sup>1162</sup>

According to another study, access to higher-speed internet connections also improved employment in SSA across sectors. Countries that had been connected to submarine internet cables earlier experienced higher employment rates (including for low-skilled workers) than countries that were connected later, and firms in these more connected countries were also more productive.<sup>1163</sup> Likewise, research indicates that access to financial technology—such as mobile payments—increases investment by firms because it lowers transaction costs and increases liquidity.<sup>1164</sup> Access to financial technology also allows household to smooth their consumption and helps to increase savings by increasing access to credit and savings opportunities<sup>1165</sup> (see case study 7.2 in this chapter for more information).

In the manufacturing sector, firms in SSA can also harness digital technologies to improve competitiveness. Increased computer processing power, combined with advances in engineering, have created more capable industrial robots and led to the development of new manufacturing processes such as 3D printing. However, while these have become more widely adopted in the manufacturing sector in advanced economies, SSA as a region still lags behind. One report found that while South African adoption of a suite of manufacturing technologies referred to as “Industry 4.0” had generally been low, these technologies could potentially have a major impact on the sector, especially in the automotive manufacturing and logistics industries.<sup>1166</sup> However, the same report found no widespread

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<sup>1159</sup> Kazeem, “Africa Is the World’s Fastest-Growing Continent,” November 7, 2019.

<sup>1160</sup> Ciera et al., *ICT Use, Innovation, and Productivity*, 2016, 21.

<sup>1161</sup> Ciera et al., *ICT Use, Innovation, and Productivity*, 2016, 21, 32.

<sup>1162</sup> Ciera et al., *ICT Use, Innovation, and Productivity*, 2016, 18.

<sup>1163</sup> Hjort and Poulsen, *The Arrival of Fast Internet and Employment in Africa*, 2019.

<sup>1164</sup> Islam, Muzi, and Meza, “Does Mobile Money Increase Firms’ Investment?” November 2016.

<sup>1165</sup> Suri and Jack, “The Long-run Poverty and Gender Impacts of Mobile Money,” December 9, 2016.

<sup>1166</sup> Industry 4.0 includes advanced analytics, cloud computing, connected sensors, robotics, and 3D printing. Deloitte, “Industry 4.0: Is Africa Ready?” 2016, 16–17.

use of robotics or 3D printing among firms in SSA more generally.<sup>1167</sup> Though a large number of examples of firms or organizations using 3D printing (also called additive manufacturing)<sup>1168</sup> have been documented,<sup>1169</sup> most of these seem to involve small firms or pilot programs. Many types of firms also take advantage of cloud computing and IaaS to substitute for in-house data storage and management. Employing cloud computing and IaaS provides the processing power needed for firms (particularly small firms) to use artificial intelligence and IoT technologies in sectors such as agriculture, healthcare, financial services, and energy<sup>1170</sup> (see case study 7.1 in this chapter for more information).

Additionally, digital technologies are creating new distribution channels for goods and services; these channels increase the availability of products and decrease transaction costs. While e-commerce is a prime example of this for goods trade, digital platforms that integrate internet-connected devices also have the potential to impact services sectors. For example, Kobo360 is a Nigerian startup which offers on-demand freight transportation services and has raised money through U.S. firm Goldman Sachs.<sup>1171</sup> U.S. firm Zipline also uses drones to deliver medical supplies to remote clinics in Rwanda and Ghana (see case study 7.5).

Another SSA firm with a U.S. connection, M-Kopa, offers households solar panels connected to the internet. This allows people without a connection to the electricity grid to use the panels on a pay-as-you-go basis (with credit provided by Mastercard); if no payment is made, the panels can be switched off remotely.<sup>1172</sup> Yet another startup uses a digital platform to keep a network of cooking fuel kiosks in Kenya stocked and to collect payments through the mobile money service M-Pesa, allowing it to offer a higher-quality, safer fuel at a lower price.<sup>1173</sup> E-commerce firms like Jumia, which is engaged in multiple SSA markets, also provide platforms to offer consumers other services such as food delivery and travel reservations. Video-streaming platforms like Netflix (headquartered in the United States) and iROKOTv (headquartered in Nigeria) distribute digital content across the continent, allowing SSA content creators to reach wider audiences at much lower costs compared to traditional media channels (for more information see case studies 7.3 and 7.4, respectively).

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<sup>1167</sup> Deloitte, "Industry 4.0: Is Africa Ready?" 2016, 17.

<sup>1168</sup> 3D printing is a process in which an individual machine, through the successive layering of material, creates a three-dimensional product.

<sup>1169</sup> Gadzala, "3D Printing: Shaping Africa's Future," April 2018, 2, 8–9; Naudé, "Entrepreneurship, Education and the Fourth Industrial Revolution," June 2017, 8.

<sup>1170</sup> USITC, hearing transcript, July 24, 2019, 51 (testimony of Mike Yeh, Microsoft Corporation).

<sup>1171</sup> The use of a digital platform allows drivers to carry less cash, which reduces their vulnerability to crime. Pilling, "The 'Uber' of Trucks," November 1, 2019; Munshi, "Tech Start-ups Drive Change for Nigerian Truckers," August 26, 2019.

<sup>1172</sup> Takahashi, "Mastercard Tests Pay As You Go for Solar Energy in Africa," February 26, 2018.

<sup>1173</sup> Wilson, "Kenyan Cooking Start-up Uses Tech," November 1, 2019.

## Policies and Market Conditions That Affect the SSA Digital Economy

### Policies That Affect the Digital Economy

According to industry representatives, while some forms of data protection and privacy laws can enhance digital trade, policies restricting cross-border flows of data (“data localization”), whether currently in place or in draft form, impact firms’ investment and trade decisions.<sup>1174</sup> Data localization measures in SSA typically require that certain data be stored and/or processed locally. Industry representatives have stated that SSA measures under consideration would limit the use of cloud computing services and would be problematic for multinational firms in all sectors that need to transfer data between entities in different countries for business purposes.<sup>1175</sup> Table 7.2 lists data-oriented legislation for each key market in this report, both laws currently in force and draft laws. These concern data protection and privacy (including laws that require data localization), e-transaction laws (which deal with some aspects of e-commerce), cybercrime laws (covering hacking, identity theft, and other issues), and consumer protection laws that include an e-commerce component.

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<sup>1174</sup> Industry representatives, interview by USITC staff, Lagos, Nigeria, September 4, 2019; industry representative, interview by USITC staff, Washington, DC, September 24, 2019; industry representative, interview by USITC staff, Washington, DC, August 15, 2019.

<sup>1175</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 4, 2019. There is some recognition of the need for data localization measures in specific cases: the USMCA, for example, provides for exceptions to prohibitions on data localization for “legitimate public policy objectives.” United States Mexico Canada Agreement (USMCA), Article 19.11.

**Table 7.2** Measures related to data privacy and cross-border flows in SSA

Country	Data protection and/or privacy laws	E-transaction laws	Cybercrime laws	Consumer protection laws (including e-commerce)
Nigeria	Data Protection Bill 2011; <sup>a</sup> Guidelines for Nigerian Content Development in ICT 2014; <sup>b</sup> Data Protection Regulation 2019 <sup>a</sup>	Electronic Commerce Bill 2011 <sup>a</sup>	Cybercrime Act 2015	Consumer Protection (Amendment) Bill <sup>a</sup>
South Africa	Protection of Personal Information Act 4 of 2013	Electronic Communications and Transactions Act, 2002	Electronic Communications and Transactions Act, 2002	Electronic Communications and Transactions Act, 2002
Kenya	Data Protection Bill 2012; Computer and Cybercrimes Bill 2017; <sup>a</sup> Data Protection Bill 2019 <sup>a</sup>	Kenya Information and Communication Act, 1998	Kenya Information and Communication Act, 1998; Cybercrime and Computer Related Crimes Bill, 2014; Computer and Cybercrimes Bill 2017; <sup>a</sup> Penal Code; Evidence Act	Consumer Protection Act
Ghana	Data Protection Act 2012, Act No. 843	Electronic Transactions Act 2008, Act No. 772	Electronic Transactions Act 2008, Act No. 772	Protection Against Unfair Competition Act 2000
Ethiopia	No law <sup>c</sup>	Electronic Signatures Act	Draft Ethiopian Cybercrime Law <sup>a</sup>	No law
Rwanda	ICT Law No. 24/2016	Law No. 18/2010	Penal Code No. 01/2012/OL of February 5, 2012	Law No. 18/2010
Côte d'Ivoire	Law No. 2013-450 of June 19, 2013, relating to the protection of personal data <sup>d</sup>	Law No. 2013-546 of July 30, 2013, relating to electronic transactions <sup>e</sup>	Law No. 2013-451 of June 2013, relating to fighting cybercrime <sup>f</sup>	Law No. 2012-293 of March 21, 2012, relating to telecommunications and ICT <sup>g</sup>

Sources: UNCTAD, "Data Protection and Privacy Legislation Worldwide" (accessed November 19, 2019); Article 19, "Kenya: Computer and Cybercrimes Bill 2017," April 12, 2018; Article 19, "Ethiopia: Computer Crime Proclamation," July 9, 2016; Article 19, "Rwanda: Law Governing Information and Communication Technologies," May 18, 2018; Parliament of Kenya, *The Data Protection Bill, 2019*, 2019; NITDA, "Guidelines for Nigerian Content Development in Information and Communications Technology (ICT)," 2014; NITDA, *Nigeria Data Protection Regulation 2019*, 2019.

Note: Nigeria's Guidelines for Nigerian Content Development and the draft Nigerian Data Protection Regulation 2019, Kenya's draft Data Protection Bill, and Côte d'Ivoire's Law No. 2013-450 contain data localization provisions for non-government data. Rwanda's Official Gazette no. 11 also requires that "critical government data must be sited inside the country."

<sup>a</sup> Draft law.

<sup>b</sup> As amended in August 2019. Law is not currently enforced.

<sup>c</sup> Ethiopia does not currently have a law covering data protection or privacy, either in full or draft form. However, in 2016, Ethiopia's House of People's Representatives adopted the Computer Crime Proclamation, which contained a number of provisions related to data. These included criminalizing the online publishing of defamatory content and the sending of spam email, both punishable by imprisonment and a fine. This law has not yet entered into force and is reportedly being revised. Article 19, "Ethiopia: Computer Crime Proclamation," July 9, 2016; Chapman, "Digital Rights in Ethiopia," October 17, 2019.

<sup>d</sup> Loi n° 2013-450 du 19 juin 2013 relative à la protection des données à caractère personnel.

<sup>e</sup> Loi n° 2013-546 du 30 juillet 2013 relative aux transactions électroniques.

<sup>f</sup> Loi n° 2013-451 du juin 2013 relative à la lutte contre la cybercriminalité.

<sup>g</sup> Loi n° 2012-293 du 21 mars 2012 relative aux télécommunications et aux TIC.

In SSA as a whole, 21 out of 49 countries have some form of data protection and privacy law,<sup>1176</sup> either currently enacted or in draft form.<sup>1177</sup> However, the implementation of the policy may be less stringent than the laws would suggest. For example, South Africa restricts the transfer of certain personal data outside of the country's borders unless the receiving country has similar data protection rules of its own.<sup>1178</sup> As a result of this and other policies, South Africa ranks 23rd out of 45 countries included on the Organisation for Economic Co-operation and Development (OECD) Services Trade Restrictiveness Index for computer services, though restrictions on cross-border data flows contribute a only small amount to its total score.<sup>1179</sup> Similarly, the country scores 8.5 out of 12.5 on its data privacy framework on the BSA Global Cloud Computing Scorecard (where higher scores indicate that the data privacy regime does not contain "onerous requirements"). This puts South Africa at about the same ranking as the United States or Singapore and somewhat below Canada,<sup>1180</sup> though one industry representative noted that data privacy policies are easy to legislate but difficult to put into practice.<sup>1181</sup>

Several key markets have also enacted data localization measures or issued draft regulations,<sup>1182</sup> which would limit or prohibit the transfer of data across borders.<sup>1183</sup> For example, Nigeria's Guidelines for Nigerian Content Development, which have been issued but are currently not enforced,<sup>1184</sup> would require ICT companies to "host all subscriber and consumer data locally within the country," as well as hosting all government data locally within the country unless approval is given by the government.<sup>1185</sup> Other Nigerian policies cover local procurement of ICT goods and local content requirements.<sup>1186</sup> Additionally, the Nigerian Data Protection Regulation 2019 (currently in draft form) would allow the international transfer of data only when certain conditions are met, including whether the foreign country to which the data is transferred provides an "adequate level of protection"<sup>1187</sup> and whether persons identified directly or indirectly in the data give explicit consent.<sup>1188</sup>

Nigeria is far from alone in its interest in localization. Côte d'Ivoire requires that firms get preapproval from regulators before processing any data outside any country in Economic Community of West African

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<sup>1176</sup> These laws are generally used to protect the privacy of individuals, but their implementation may raise costs for firms and may potentially impact the viability of services that rely on the cross-border flow of data. For a more in-depth discussion, see chapter 8 of USITC, *Global Digital Trade 1*, August 2017.

<sup>1177</sup> UNCTAD, "Data Protection and Privacy Legislation Worldwide" (accessed November 19, 2019).

<sup>1178</sup> Government of South Africa, Department of Justice, *Protection of Personal Information Act, 2013*, 2013.

<sup>1179</sup> Other restrictions, such as rules concerning public procurement, investment screening, and performance requirements, also contributed to this score. OECD, STRI Policy Simulator (accessed January 3, 2019).

<sup>1180</sup> South Africa was the only SSA country included on the OECD and BSA rankings. BSA | The Software Alliance, "2018 BSA Global Cloud Computing Scorecard," 2018.

<sup>1181</sup> Industry representative, interview by USITC staff, Washington, DC, August 15, 2019.

<sup>1182</sup> For more discussion of the effects of data localization laws on firms, see the case study 7.1 on cloud computing in this chapter.

<sup>1183</sup> USITC, *Global Digital Trade 1*, August 2017, 277.

<sup>1184</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 14, 2019; industry representative, email message to USITC staff, February 11, 2020.

<sup>1185</sup> NITDA, *Guidelines for Nigerian Content Development*, as amended August 2019, 2019, 24.

<sup>1186</sup> NITDA, *Guidelines for Nigerian Content Development*, as amended August 2019, 2019, 18–19.

<sup>1187</sup> What constitutes an "adequate level of protection" is not defined in the document, but one source indicates it will be determined by Nigeria's National Information Technology Development Agency (NITDA). Papageorgiou, "Nigeria: Data Protection Regulation 'Will Help Close the Gaps,'" February 21, 2019.

<sup>1188</sup> NITDA, Nigeria Data Protection Regulation 2019, 2019, 11–12.

States (ECOWAS).<sup>1189</sup> Kenya has a draft Data Protection Bill that would prohibit the cross-border processing of sensitive personal data unless certain conditions are met<sup>1190</sup> with rules similar to the EU’s General Data Protection Regulation.<sup>1191</sup> A previous version of the bill also had a provision that would have required a copy of all data to be stored in a data center in Kenya, though this provision was removed in a November 2019 update to the draft.<sup>1192</sup> Rwanda requires that all “critical” data related to government operations be stored in a national data center inside the country and has fined a telecommunications firm for processing subscriber data outside the country in violation of its license, which required domestic processing of data.<sup>1193</sup> Several other SSA markets such as Nigeria and members of the West African Economic and Monetary Union (WAEMU) also have requirements in place that mandate all financial transactions data to be processed locally.<sup>1194</sup>

Multiple industry representatives have stated these data localization requirements would negatively impact the digital economy in SSA. One industry representative noted that these laws would make certain technologies harder to access for both firms and consumers.<sup>1195</sup> Another firm indicated that they could offer more services if the proposed data localization in Nigeria did not go into effect.<sup>1196</sup> Several other industry representatives stated that data localization is their primary policy concern in SSA.<sup>1197</sup> One industry representative noted that in Rwanda, their firm needed to get an exemption for a particular agricultural technology so the firm could transfer and store data outside the country.<sup>1198</sup> On the other hand, an industry representative of a large firm operating in several SSA markets stated that it could comply with a data localization law and continue operating.<sup>1199</sup>

Another industry representative stated that the effects that data localization measures have on firms are difficult to quantify, but countries like Nigeria and Kenya are trendsetters in SSA with regard to digital regulation,<sup>1200</sup> and other countries may follow their lead. Some SSA government representatives have also noted that SSA countries want to benefit from the data being generated domestically through increased job creation, and governments saw data localization as one way to do so.<sup>1201</sup> These representatives also noted the perception that data localization requirements could improve

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<sup>1189</sup> Government of Côte d’Ivoire, Loi no 2013-450 (Law No. 2013-450), June 2013.

<sup>1190</sup> Government of Kenya, Parliament of Kenya, The Data Protection Bill, 2019, 2019, 32.

<sup>1191</sup> Industry representative, interview by USITC staff, Washington, DC, September 24, 2019.

<sup>1192</sup> Government of Kenya, Parliament of Kenya, The Data Protection Bill, 2019, November 11, 2019, 32;

Government of Kenya, Parliament of Kenya, The Data Protection Bill, 2018, August 14, 2018.

<sup>1193</sup> Government of Rwanda, *Ministerial Order Determining License Fees for Special Economic Developers/operators in Rwanda*, March 12, 2012, 48.

<sup>1194</sup> ITIF, written submission to the USITC, August 15, 2019, 9.

<sup>1195</sup> USITC, hearing transcript July 24, 2019, 54 (testimony of Mike Yeh, Microsoft Corporation).

<sup>1196</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 4, 2019.

<sup>1197</sup> Industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019; industry representative, interview by USITC staff, Washington, DC, September 24, 2019.

<sup>1198</sup> USITC, hearing transcript July 24, 2019, 62 (testimony of Mike Yeh, Microsoft Corporation)

<sup>1199</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 3, 2019.

<sup>1200</sup> Industry representative, interview by USITC staff, Washington, DC, August 15, 2019.

<sup>1201</sup> Government representative, interview by USITC staff, September 10, 2019.

government ownership and control of data<sup>1202</sup> by requiring data to be stored domestically where SSA governments have jurisdiction.

While data localization regulations can affect almost all sectors in the digital economy, some sectors have specific regulations that impact them, described in more detail in case study 7.2 in this chapter. In fintech, government licensing rules and other regulations may restrict the types of financial services these firms are allowed to provide. For example, many mobile money providers are not allowed to supply banking services such as offering credit,<sup>1203</sup> and payment services (which underpin many online transactions) are also subject to restrictions in various SSA countries.<sup>1204</sup> The telecommunications sector is another where licensing requirements (along with foreign equity restrictions) play a key role, though some countries are liberalizing. For example, Ethiopia recently announced it will award licenses to two multinational private telecom operators and invite foreign firms to bid on a minority stake in Ethio Telecom (the current monopoly provider) as part of an effort to privatize its state-owned telecom sector.<sup>1205</sup> In other sectors, such as digital streaming video, there are few if any specific regulations (beyond certain content restrictions)<sup>1206</sup> in place, while e-commerce is typically governed by the same rules and consumer protections as those for offline commerce (described in case studies 7.3 and 7.4 of this chapter, respectively).

Though not yet implemented by any SSA country, the prospect of taxes on the transmission of data or digital services in SSA<sup>1207</sup> is also of concern to industry representatives.<sup>1208</sup> South Africa in particular has argued for the removal of the WTO's moratorium on customs duties for electronic transmissions.<sup>1209</sup> One report finds that these duties could be a key source of revenue for developing countries,<sup>1210</sup> though another study estimates that losses in tax revenue from firms impacted by these duties would outweigh the increased customs revenue for countries implementing them.<sup>1211</sup> Some SSA countries—for example,

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<sup>1202</sup> Government representative, interview by USITC staff, September 10, 2019.

<sup>1203</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019; industry representative, interview by USITC staff, Lagos, Nigeria, September 3, 2019.

<sup>1204</sup> ITIF, written submission to the USITC, August 15, 2019, 9.

<sup>1205</sup> Fick, "Ethiopia to Issue Two Telecoms Licenses," July 5, 2019; Paravicini, "Ethiopia Appoints Ethio Telecom Privatization Adviser," September 26, 2019.

<sup>1206</sup> Many SSA countries have restrictions on the type of content that can be shown on TV and film; in some cases, restrictions are extended to online video. For example, in South Africa the Film and Publications Amendment Act 11 of 2019 extends the same compliance obligations to online distributors as to other media distributors. Government of South Africa, *Films and Publications Amendment Act 11 of 2019*, 2019.

<sup>1207</sup> Several SSA countries have also been active in the WTO e-commerce negotiations. For more information see Hope, and Sauli, "Africa and the WTO's E-Commerce Agenda," January 19, 2018.

<sup>1208</sup> USITC, hearing transcript July 24, 2019, 119–20 (testimony of Mike Yeh, Microsoft Corporation); industry representative, interview by USITC staff, Washington, DC, July 11, 2019; industry representative, interview by USITC staff, September 24, 2019.

<sup>1209</sup> Monicken, "India, South Africa: WTO E-commerce moratorium," June 5, 2019.

<sup>1210</sup> Banga, "Growing Trade in Electronic Transmissions," 2019.

<sup>1211</sup> Lee-Mkiyama and Narayanan, "The Economic Losses," August 2019.

Uganda—also tax specific social media services such as Facebook, WhatsApp, and Twitter, which has led to a decrease in the number of users.<sup>1212</sup>

In certain countries, government-initiated internet shutdowns<sup>1213</sup> also have the potential to undermine the digital economy. One source estimated that shutdowns cost economies in SSA \$2.16 billion collectively in 2019.<sup>1214</sup> Such shutdowns—which run the gamut from blocking specific social media and messaging services to country-level network blackouts—tend to occur during times of political unrest or in the run-up to elections. In Zimbabwe, for example, the government allegedly blocked access to WhatsApp during anti-government protests in July 2016. The following month, the Zimbabwean telecom regulator ordered mobile operators to suspend less-expensive Facebook and WhatsApp data plans, driving up mobile data prices 500 percent. Although the ICT minister later reversed the directive, many observers suspected that the timing of the increase was designed to curtail mobile internet access during a period of continued unrest.<sup>1215</sup> In Ethiopia, network shutdowns have been a frequent occurrence since 2015, often lasting for days or weeks at a time.<sup>1216</sup> Political unrest in Cameroon was cited as a reason the government shut down internet for 230 days between January 2017 and March 2018, which contributed to Nigerian e-commerce firm Jumia’s decision to leave the country.<sup>1217</sup>

These are not isolated cases. According to AccessNow, social media/messaging or full network shutdowns have also occurred in Uganda, Zambia, The Gambia, Côte d’Ivoire, the Democratic Republic of the Congo, Chad, and Sierra Leone.<sup>1218</sup> Several other SSA countries (including Nigeria) have introduced full or draft laws in recent years that would block the distribution of certain content (on the internet or through messaging services) which the government deems sensitive or offensive.<sup>1219</sup>

## Market Conditions

While increased internet connectivity has driven the supply of digital goods and services in SSA, a growing population, coupled with increases in consumer spending power and economic growth, drives

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<sup>1212</sup> Gbenga, “Uganda Counting the Costs,” December 11, 2019. Facebook had 73 percent of the social media market in Africa in March 2020, and all the top 5 firms by market share were U.S. firms. Statcounter, “Social Media Stats Africa” (accessed March 30, 2020).

<sup>1213</sup> An internet shutdown is defined as “an intentional disruption of the internet or electronic communications, rendering them inaccessible or effectively unusable, for a specific population or within a location, often to exert control over the flow of information.” AccessNow, “What Is an Internet Shutdown?” (accessed September 27, 2019).

<sup>1214</sup> Woodhams and Migliano, “The Global Cost of Internet Shutdowns in 2019,” January 7, 2020.

<sup>1215</sup> Freedom House, “Freedom in the World 2018: Zimbabwe,” 2018.

<sup>1216</sup> Freedom House, “Freedom in the World 2018: Ethiopia,” 2018.

<sup>1217</sup> Atabong, “Jumia’s Cameroon Exit,” November 19, 2019.

<sup>1218</sup> Freedom House, “Freedom in the World 2018: Uganda,” 2018; Freedom House, “Freedom in the World 2018: Zambia,” 2018; AccessNow, “Shutdown Tracker Optimization Project,” June 2018.

<sup>1219</sup> Paquette, “Nigeria’s ‘Fake News’ Bill,” November 25, 2019; Media Update, “The ‘Internet Censorship’ Bill,” March 6, 2019. For more on internet content controls, see Freedom House, “Freedom on the Net 2018,” October 2018.

demand.<sup>1220</sup> The population of SSA in 2018 was slightly less than 1.1 billion people,<sup>1221</sup> and it is projected to double between 2019 and 2050.<sup>1222</sup> The working-age population in SSA is growing faster than other age groups, due to declining fertility rates among women in many countries.<sup>1223</sup> This population is also increasingly urban; 40.2 percent of SSA residents lived in a city in 2018,<sup>1224</sup> and this share is projected to rise to 50 percent by 2037.<sup>1225</sup>

Increased economic growth and consumer spending power in SSA have also driven demand for digital products and services. GDP per capita in SSA reached \$1,660 in 2018, slightly higher than in 2010, after peaking in 2014 at \$1,692.<sup>1226</sup> However, this volatility masks high growth in several of the key markets, including Ethiopia (which grew 6.6 percent over the same period), Rwanda (4.4 percent), and Ghana (4.2 percent).<sup>1227</sup> SSA's consumer spending (people's spending on goods and services beyond their basic needs) is also rising, though estimates vary. One report calculated it at over \$1.4 trillion in 2015 in Africa as a whole,<sup>1228</sup> and projected that such spending would reach \$2.1 trillion per year by 2025. Another report estimated that both consumer and business spending would total \$5.6 billion by 2025.<sup>1229</sup>

Additionally, one study estimated that 582 million Africans earned between \$2 and \$20 per day, while 116 million earned more than \$20 per day.<sup>1230</sup> Four of the seven key SSA markets also ranked in Africa's top 10 according to one measure of consumer class growth in 2017.<sup>1231</sup> Though much of this spending is still directed toward daily necessities, in every key market but Nigeria households reported spending more money on ICT (including mobile phones and airtime) than on healthcare, according to a 2010 World Bank survey.<sup>1232</sup> Countries with higher mobile phone penetration rates also showed substantially higher consumer spending,<sup>1233</sup> highlighting a link between countries' digital and non-digital economies.

Access to the internet is not equitably distributed among ages, incomes, and genders. One survey of several SSA countries found women were less likely to own a mobile phone and use the internet than men.<sup>1234</sup> The cost of ICT devices, as well as the cost of data, are also barriers to access,<sup>1235</sup> as is the lack

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<sup>1220</sup> For more information on population, infrastructure, and economic growth in SSA, see the chapter 4 overview.

<sup>1221</sup> World Bank, World Development Indicators, "Population" (accessed November 18, 2019).

<sup>1222</sup> UN, "World Population Prospects 2019: Highlights," June 17, 2019.

<sup>1223</sup> UN, "World Population Prospects 2019: Highlights," June 17, 2019.

<sup>1224</sup> World Bank, World Development Indicators, "Urban Population % of total" (accessed November 18, 2019).

<sup>1225</sup> MGI, "Lions on the Move II," September 2016, 126.

<sup>1226</sup> World Bank, World Development Indicators, "GDP per Capita (constant 2010 US\$)" (accessed January 22, 2020).

<sup>1227</sup> Growth in GDP per capita in the two largest SSA economies, South Africa and Nigeria, was less than 1 percent during this period. World Bank, World Development Indicators, "GDP per Capita (constant 2010 US\$)" (accessed January 22, 2020).

<sup>1228</sup> Signé and Johnson, "African Consumer Market Potential," December 2018, 1.

<sup>1229</sup> Consumer and business spending are currently estimated to be around \$4 trillion annually. MGI, "Lions on the Move II," September 2016, 1, 43.

<sup>1230</sup> Signé and Johnson, "African Consumer Market Potential," December 2018, 12–13.

<sup>1231</sup> The four markets were South Africa (number 3), Rwanda (7), Kenya (8), and Ghana (9). Attwell, "3 Things Multinationals Don't Understand about Africa's Middle Class," April 18, 2017.

<sup>1232</sup> World Bank, *Global Consumption Database* (accessed November 20, 2019).

<sup>1233</sup> Signé and Johnson, "African Consumer Market Potential," December 2018, 14.

<sup>1234</sup> After Access, "Let the People Speak," 2017, 12 and 16.

<sup>1235</sup> See box 7.1 on smart feature phones in this chapter for more on data and device costs.

of literacy and a scarcity of content in local languages.<sup>1236</sup> The level of formal education and of ICT-specific skills also varies among SSA countries and within populations,<sup>1237</sup> which makes it difficult for some residents of SSA to capitalize on recent developments in the digital economy. For these and other reasons, some experts are skeptical of SSA’s ability to use digital technology to “leapfrog” more established economic development models.<sup>1238</sup>

## Case Study 7.1: Cloud IaaS in Sub-Saharan Africa

### Key Findings

Cloud infrastructure as a service (IaaS) serves as the backbone for all other cloud services by providing a platform for cloud software providers to produce and disseminate their products. Because cloud IaaS depends on internet connectivity, adoption of IaaS in SSA is slower than in most parts of the world. The only IaaS provider with a hyperscale data center (at least 5,000 servers) in SSA is Microsoft, though other U.S. providers also serve firms in SSA where internet infrastructure is sufficiently developed for reliable connectivity to data centers located outside the continent.<sup>1239</sup> Because cloud IaaS providers operate a global network, the primary policy barriers to trade in cloud IaaS services are data localization requirements.

### Overview of the SSA Cloud Computing Market

Cloud IaaS is a segment of cloud computing that provides businesses with remote data storage and processing capabilities accessible via the internet. IaaS replaces traditional in-house servers or data centers and allows firms to purchase data storage in a remote data center as needed, rather than invest in additional in-house servers. In addition to selling IaaS directly to firms, IaaS providers can also use their cloud infrastructure to host and manage software that consumers access via the internet (known as software as a service, or SaaS) or facilitate the dissemination of SaaS from other firms by providing underlying infrastructure.<sup>1240</sup>

Cloud IaaS is designed to replace in-house data storage. However, firms in SSA are currently more dependent on traditional in-house data center infrastructure than the rest of the world. In 2018,

<sup>1236</sup> After Access, “Let the People Speak,” 2017, 26.

<sup>1237</sup> Choi et al., “Future of Work in Africa,” 2019, 47–49.

<sup>1238</sup> Pilling, “African Economy: The Limits of ‘Leapfrogging,’” August 18, 2018; Simons, “Why ‘Leapfrogging’ in Frontier Markets Isn’t Working,” March 2019.

<sup>1239</sup> Other characteristics of hyperscale data centers include a size of at least 10,000 square feet, and ultra-high-speed and high-fiber-count links between servers. This scale and speed allow companies with hyperscale data centers to provide cloud-based applications and storage. AFL Hyperscale, “What Is a Data Center?” (accessed December 18, 2019).

<sup>1240</sup> For a broader discussion of cloud computing and cloud IaaS, see chapter 3 of USITC, *Global Digital Trade 1*, 2017. USITC, hearing transcript, July 24, 2019, 117 (testimony of Mike Yeh, Microsoft Corporation); USITC, *Global Digital Trade 1*, August 2017, 58.

companies in the broader Middle East and Africa region spent \$3.5 billion on IT infrastructure hardware, of which 72.3 percent (\$2.8 billion) was on traditional (non-cloud) IT infrastructure.<sup>1241</sup> In contrast, for the rest of the world, traditional IT infrastructure made up only 52.5 percent of total spending. One industry representative suggested that the shift to cloud computing in SSA only began in the last five years (i.e., since 2015).<sup>1242</sup>

## The Role of U.S. Firms in Supplying This Service

In 2018, the top six global IaaS providers were U.S. firms Amazon Web Services (AWS), Microsoft, Google, IBM, and Oracle, and Chinese firm Alibaba.<sup>1243</sup> U.S. firms operating in SSA tend to compete with each other to provide cloud IaaS, rather than compete with non-U.S. firms.<sup>1244</sup> Of the top six global providers, only Microsoft, as noted above, currently has a hyperscale cloud data center located in SSA, which came online in South Africa in March 2019.<sup>1245</sup> AWS has also announced plans for a South African hyperscale data center, which is anticipated to open in the first half of 2020.<sup>1246</sup> Other providers offer a range of cloud services in SSA beyond IaaS, such as SaaS for both enterprises and consumers.<sup>1247</sup>

South Africa is a key SSA market for IaaS, due to its relatively developed internet infrastructure as well as the dearth of software engineers and other skilled workers that can be hired locally as cloud services expand in SSA.<sup>1248</sup> While the lack of data centers in SSA does not preclude firms from accessing global IaaS networks via the internet, local data center hubs and regional coverage can provide lower latency and a broader suite of services, including SaaS, for consumers in SSA.<sup>1249</sup> In addition to internet connectivity itself, the latency of an internet connection can also determine whether cloud IaaS adoption is feasible.

Since cloud IaaS is a substitute for on-premise storage, major competition in the cloud IaaS market in SSA also comes from traditional data storage providers. SSA is transitioning from on-premise to cloud-based storage at a slower rate than the rest of the world. As a result, IaaS providers typically compete with legacy infrastructure from governments in partnerships with local telecom companies, or local IT infrastructure providers.<sup>1250</sup>

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<sup>1241</sup> USITC estimate using data from Subramani and Kumar, “Enterprise IT Outlook,” IDC, 2019, and Mehra et al., “Worldwide Cloud IT Infrastructure Hardware,” 2019.

<sup>1242</sup> Industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019.

<sup>1243</sup> Gartner, “Gartner Says Worldwide IaaS Public Cloud Services,” July 29, 2019.

<sup>1244</sup> USITC, hearing transcript, July 24, 2019, 114–17 (testimony of Mike Yeh, Microsoft Corporation) industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019; industry representative, interview by USITC staff, Johannesburg, South Africa, September 19, 2019.

<sup>1245</sup> Tullett, “Disruptive Impact of Microsoft’s Launch of an Azure Region in South Africa,” April 2019.

<sup>1246</sup> AWS, “AWS Africa” (accessed March 9, 2020).

<sup>1247</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 4, 2019.

<sup>1248</sup> Industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019.

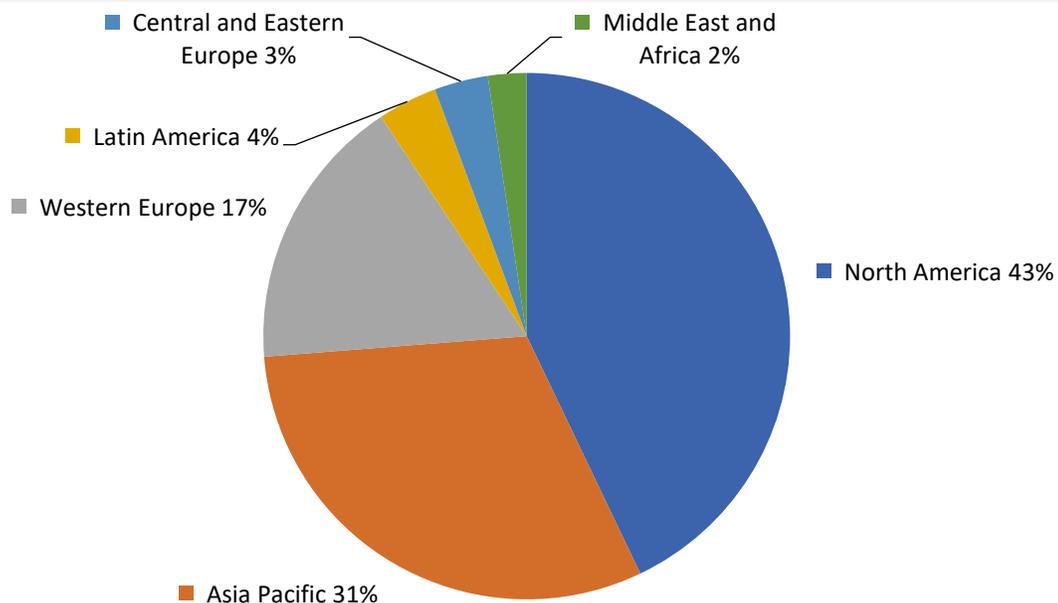
<sup>1249</sup> Industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019. Latency refers to the gap between the time when a data request is made over the internet and the time when the information is provided, and lower latency (faster response time) is needed for more data-intensive applications (such as video streaming) to function as intended. USITC, *Recent Trends in U.S. Services Trade*, 2018, 78.

<sup>1250</sup> USITC, hearing transcript, July 24, 2019, 72, 98–99 (testimony of Mike Yeh, Microsoft Corporation).

## Overall SSA Market for Cloud IaaS

In 2018, the global market for public cloud IaaS was \$32.4 billion in revenue.<sup>1251</sup> A lack of disaggregated data makes it difficult to isolate the contribution of SSA IaaS to this total, but data on total cloud traffic indicate that the region represents a small share of the total cloud market. As shown in figure 7.3, in 2017, 8,190 exabytes of data traveled across global cloud networks, and the entire Middle East and Africa region represented only 2 percent (194 exabytes) of all cloud data traffic in 2017.<sup>1252</sup> South Africa is the largest IT market for cloud IaaS in SSA, accounting for about 30 percent of all cloud IaaS spending in the Middle East and Africa region from 2013 to 2017.<sup>1253</sup> Small and medium-sized enterprises (SMEs) and startups in SSA are most likely to adopt cloud IaaS services, as they do not have legacy systems in place. By contrast, governments are the least interested in shifting from traditional data centers to cloud IaaS due to existing infrastructure and concerns about data privacy.<sup>1254</sup> For example, in South Africa, only 10 percent of government data storage is in cloud infrastructure; the rest is stored in in-house government servers<sup>1255</sup> which is high compared to other SSA countries but lower than in developed countries. Similarly, in Rwanda, there is a mandate for government data to be stored in government-owned data centers.<sup>1256</sup>

**Figure 7.3** Worldwide cloud traffic by region, 2017



<sup>1251</sup> Gartner, “Gartner Says Worldwide IaaS Public Cloud Services,” July 29, 2019.

<sup>1252</sup> One exabyte represents 1 billion gigabytes (GB) of data. Cisco, “Cisco Global Cloud Index: Forecast and Methodology,” 2018.

<sup>1253</sup> IDC, “Cloud Services,” March 2017.

<sup>1254</sup> Industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019; USITC, hearing transcript, July 24, 2019, 98–99 (testimony of Mike Yeh, Microsoft Corporation).

<sup>1255</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 18, 2019.

<sup>1256</sup> ITIF, written submission to the USITC, August 15, 2019, 9.

Source: Cisco, “Global Cloud Index,” 2018.

Note: See appendix table I.9 for a tabular presentation of the data in this figure.

## How the Adoption of IaaS Affects Other Sectors

IaaS has the potential to support firms throughout the economy by acting as a substitute for in-house data storage and management.<sup>1257</sup> Additionally, for companies within the computer services sector, particularly app and software developers, using IaaS as their infrastructure helps facilitate expansion into global markets. For example, if a small company builds an app in the United States using an IaaS provider, they automatically also have infrastructure to support the launch of that app in SSA markets.<sup>1258</sup> Cloud IaaS also provides the processing power needed to support Internet of Things (IoT) devices, by aggregating and processing data from multiple devices.<sup>1259</sup> For example, Sun Culture, a solar-powered irrigation system, uses Microsoft cloud services combined with IoT devices to improve efficiency of water use in Kenya.<sup>1260</sup>

## Policies and Market Conditions Affecting Cloud Computing

The primary barriers to cloud IaaS adoption in SSA are market conditions and policy measures. Some of the market factors that influence IaaS adoption are consumer confidence and internet connectivity and reliability, while data localization requirements represent the primary policy measure that limits cloud services.

### Market Conditions

The adoption of cloud IaaS depends on consumer confidence in the product. As one industry representative noted, some customers might feel that being in control of the physical infrastructure associated with data storage and processing would improve data security. This consideration might limit uptake of cloud IaaS, despite the economies of scale that larger IaaS firms can draw on to help protect data.<sup>1261</sup> For example, one industry representative noted that in South Africa, cloud adoption has been limited due to concerns over security and data privacy.<sup>1262</sup> In the same vein, data localization measures can reflect the assumption that data stored within a country is safer than data stored globally, even

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<sup>1257</sup> USITC, hearing transcript, July 24, 2019, 102 (testimony of Mike Yeh, Microsoft Corporation).

<sup>1258</sup> USITC, hearing transcript, July 24, 2019, 72 (testimony of Mike Yeh, Microsoft Corporation).

<sup>1259</sup> Cisco, *Fog Computing and the Internet of Things*, 2015. The Internet of Things (IoT) refers to digital technologies that include physical devices and sensors connected through a network. For more information on IoT, see case study 7.5 in this chapter and USITC, *Global Digital Trade 1*, August 2017, 196.

<sup>1260</sup> USITC, hearing transcript, July 24, 2019, 52 (testimony of Mike Yeh, Microsoft Corporation). For other examples of cloud IaaS supporting other services, see case studies 7.2–7.5 in this chapter as well as case study 6.2 in chapter 6.

<sup>1261</sup> USITC, hearing transcript, July 24, 2019, 118 (testimony of Mike Yeh, Microsoft Corporation).

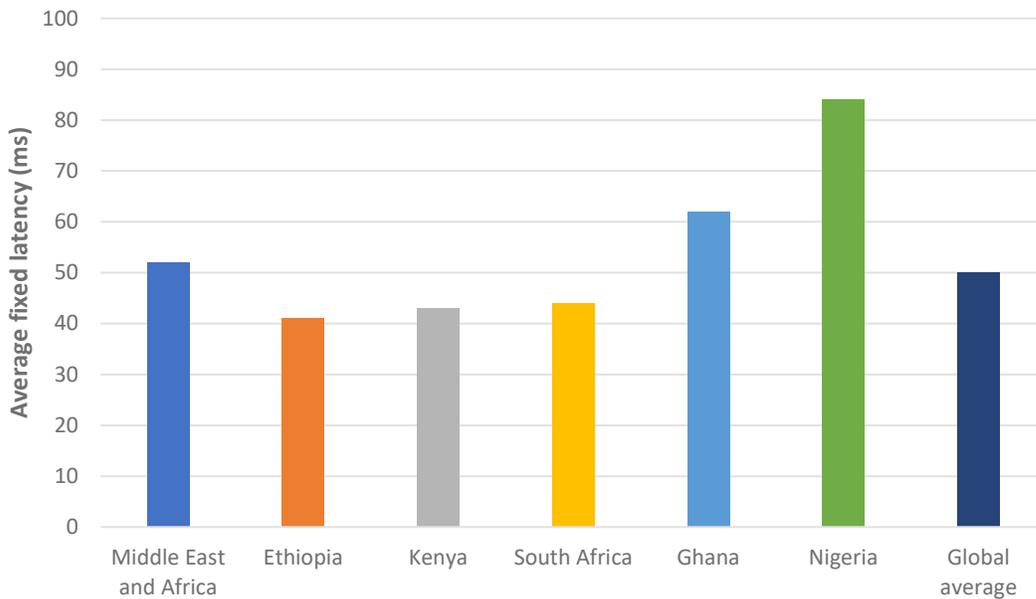
<sup>1262</sup> Kumar, “How Cloud Services and the Microsoft Ecosystem,” April 2018, 3.

though the security of data depends more on the technical, physical, and administrative controls of a data center than its location.<sup>1263</sup>

Another important driver of cloud IaaS adoption is internet connectivity. Without a reliable internet connection, accessing data storage via the internet is not feasible. In the key SSA markets studied in this report, only South Africa had a higher share of individuals with access to the internet than the world average in 2017 (56.2 and 49.7 percent, respectively).<sup>1264</sup> This reliance on connectivity also means that cloud IaaS uptake in SSA is primarily in urban centers, as investment in submarine cables (and fiber optic connections to submarine cables) has been focused on delivering reliable service in major cities.<sup>1265</sup>

As noted earlier, the latency of an internet connection can also determine whether cloud IaaS adoption is feasible. Latency in SSA has been declining in recent years but is still higher than in other regions: since 2013, the average latency for fixed broadband connections in the Middle East and Africa has declined from 87 milliseconds (ms) in 2014 to 52 ms in 2017, but this is as compared to 31 ms globally. As shown in figure 7.4, among the key markets in this report, three had lower fixed latency than the average for the Middle East and Africa combined: Ethiopia (41 ms), Kenya (43 ms), and South Africa (44 ms) but all were higher than the global average.<sup>1266</sup>

**Figure 7.4** Average fixed latency, by country, 2017



Source: Cisco, “Global Cloud Index,” 2018; Cisco, “Cloud Readiness Tool,” 2018. (accessed August 13, 2019).

<sup>1263</sup> Corey, written submission to USITC, August 15, 2019, 6.

<sup>1264</sup> World Bank, “Percent of Individuals Using the Internet,” World Development Indicators (accessed August 13, 2019).

<sup>1265</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 18, 2019. See appendix H for more information on broadband connectivity in SSA.

<sup>1266</sup> Nigeria, Rwanda, and Ghana had latency higher than the regional average, at 84ms, 63ms, and 62ms, respectively. Data were not available for Côte d’Ivoire. Cisco, “Cloud Readiness Tool,” 2018 (accessed August 13, 2019).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Notes: Country-level data are not available for Côte d'Ivoire. Ethiopia's low latency may reflect its overall low internet connectivity outside of major cities; only 19 percent of households were connected to the internet in 2017. See appendix H more information. See appendix table I.10 for a tabular presentation of the data in this figure.

One way that cloud IaaS providers can minimize the latency of their services is through content delivery networks (CDNs). CDNs providers use a network of geographically dispersed servers that create copies of information accessed via the internet, so that when a user in a specific location seeks to access an online resource, the user is routed to the closest CDN server, thus decreasing latency.<sup>1267</sup> In particular, CDN services help facilitate video streaming, web and email communication, online gaming, and file sharing. In recent years, CDN providers have begun working with public cloud providers to help facilitate access to cloud services.<sup>1268</sup> For example, in October 2017, IBM partnered with U.S. CDN provider Akamai Technologies (Akamai) to deliver IBM's cloud services through local copies hosted on Akamai's CDN.<sup>1269</sup> This partnership means that when firms use IBM's cloud services (both IaaS and SaaS), they do not need to access IBM's hyperscale data centers directly (none of these are located in SSA). Firms can instead access cloud IaaS via Akamai's CDN, which does have servers in SSA, including in South Africa, Ghana, Nigeria, Kenya, and Rwanda.<sup>1270</sup>

### Policy Measures

In addition to the limitations that may be imposed by weak internet infrastructure development, policy measures such as data localization requirements, tariffs on digital products, and regulatory harmonization are all important for cloud IaaS providers.

Data localization restrictions undermine the adoption of cloud IaaS services, as providers depend on a globally connected platform for their operations.<sup>1271</sup> Several of the key markets identified in this study have some level of data localization restrictions (listed in table 7.2). In particular:

- In Côte d'Ivoire, firms need preapproval from a regulatory authority to process data outside of the Economic Community of Western African States.<sup>1272</sup>
- In Nigeria, since 2015, ICT companies have been required to host all "subscriber and consumer data" locally.<sup>1273</sup> Although this regulation is not currently enforced, it has the potential to limit IaaS expansion to West Africa, since Nigeria is a natural hub due to its size of the economy and population.<sup>1274</sup>

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<sup>1267</sup> USITC, *Global Digital Trade 1*, August 2017, 64.

<sup>1268</sup> Abdo, Fremeijer, and Mahale, "Worldwide Content Delivery Network Services," May 2019, 6.

<sup>1269</sup> IBM, "Akamai Content Delivery Network Now Available," October 9, 2017.

<sup>1270</sup> Akamai, "Media Delivery Network Map" (accessed August 14, 2019).

<sup>1271</sup> USITC, hearing transcript, July 24, 2019, 69 (testimony of Mike Yeh, Microsoft Corporation).

<sup>1272</sup> ITIF, written submission to the USITC, August 15, 2019, 6; UNCTAD, "Data Protection and Privacy Legislation Worldwide" (accessed November 19, 2019). The Economic Community of Western African States (ECOWAS) includes Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. ECOWAS, "Member States," <https://www.ecowas.int/member-states/> (accessed January 21, 2020).

<sup>1273</sup> ITIF, written submission to the USITC, August 15, 2019, 8; Scarpelli, written submission to the USITC, July 17, 2019, 8; NITDA, *Nigeria Data Protection Regulation 2019*, 2019.

<sup>1274</sup> Industry representative, interview by USITC staff, Johannesburg, South Africa, September 18, 2019; industry representative, interview by USITC staff, Lagos, Nigeria, September 4, 2019.

- In Rwanda, all government-related critical data must be stored locally in a central designated data center.<sup>1275</sup>

South Africa’s opposition to the renewal of the 1998 WTO moratorium on customs duties for “electronic transmissions” also causes concern for cloud IaaS providers.<sup>1276</sup> Electronic transmissions cover a broad category of services, which likely includes cross-border data transmissions and cloud services.<sup>1277</sup> If the moratorium is allowed to expire in 2020, some countries could impose duties on cross-border electronic transmissions, such as those related to cloud services. The scope and implementation of tariffs on electronic transmissions would be difficult to define, and once implemented, tariffs could increase costs for both consumers and firms that sell their services over the internet.

Finally, regulatory harmonization is important for cloud providers. Currently, there is no unified approach to regulating personal data protection throughout SSA, which can limit providers’ ability to achieve the economies of scale associated with a regional cloud network.<sup>1278</sup> Globally, the EU General Data Privacy Regulation (GDPR) has begun to act as a baseline standard, as firms in Africa that want to do business in Europe need to comply with GDPR.<sup>1279</sup> If SSA countries also adopt a version of GDPR as their privacy standard, U.S. firms that are already GDPR compliant should be able to operate in these markets.<sup>1280</sup> However, some industry sources also state that the individual provisions of the GDPR legislation should be carefully considered before they are adopted.<sup>1281</sup>

## Case Study 7.2: Financial Technology in SSA

### Key Findings

Fintech applications are commonly used in sub-Saharan Africa. SSA countries are not major financial services trade partners with the United States, but some U.S. companies operate, invest, or have formed partnerships in SSA’s fintech sector. Fintech benefits customers in SSA by increasing financial inclusion (giving individuals and businesses access to affordable financial products) and facilitating domestic and cross-border transfers of money. However, complex regulations affect fintech in SSA, and these regulations differ significantly between countries, which hinders adoption in some markets.

<sup>1275</sup> ITIF, written submission to the USITC, August 15, 2019, 9.

<sup>1276</sup> WTO, “MC11 in Brief: Electronic Commerce,” December 2017.

<sup>1277</sup> Lee-Makiyama, “Threats to the E-Commerce Moratorium,” November 7, 2019.

<sup>1278</sup> ITIF, written submission to the USITC, August 15, 2019, 3; industry representative, interview by USITC staff, Cape Town, South Africa, September 10, 2019.

<sup>1279</sup> USITC, hearing transcript, July 24, 2019, 77 (testimony of Mike Yeh, Microsoft Corporation); European Union, General Data Protection Regulation 2016/679.

<sup>1280</sup> Industry representative, interview by USITC staff, Washington, DC, August 15, 2019.

<sup>1281</sup> In particular, the Information Technology and Innovation Foundation (ITIF) notes that GDPR sections related to data controller/processor registration, the “adequacy” approach to international data transfers, explicit consent, and the right to be forgotten should be given particular consideration. ITIF, written submission to the USITC, August 15, 2019, 5.

## Overview of SSA's Financial Technology Market

Fintech refers to the provision of financial services (such as payments and loans) using mobile and digital technologies like smartphones. In developed countries, where traditional banks are widely available, many banks are launching their own fintech services, acquiring startups, or partnering with tech companies. In developing countries, fintech applications are both complements to and substitutes for traditional physical financial institutions, as they let businesses and individuals without a bank account or access to related infrastructure use financial services.

Although SSA has low rates of access to formal banking services, widespread use of mobile phones has enabled the region to become a global leader in fintech adoption. SSA countries lead the world in the number of mobile money accounts (that is, financial accounts accessed by mobile phones) per capita and in mobile money transactions per capita.<sup>1282</sup> Twenty-one percent of adults in SSA had a mobile money account in 2017, twice as many as in 2014 and the highest percentage of any region in the world.<sup>1283</sup> Since 2015, mobile money accounts have outpaced traditional bank accounts in the region, and in 2019 the International Monetary Fund (IMF) estimated the value of mobile money transactions in SSA to be equivalent to 10 percent of its GDP.<sup>1284</sup>

Many transactions are simple person-to-person transfers, but people in SSA are increasingly using mobile money for paying bills, receiving wages, and purchasing goods and services. Some of these applications do not require traditional bank accounts, while others, like check deposits and account balance inquiries, do.<sup>1285</sup> Investors have been taking notice of fintech's rise in SSA. In one survey, 40 percent of African banking customers preferred to use digital tools for financial transactions.<sup>1286</sup> By one estimate, fintech firms took one third of all African venture capital funding in 2017 (\$195 million).<sup>1287</sup> Some U.S. firms are involved in SSA's fintech market as investors, and some provide services directly (see the section entitled "Role of U.S. Firms in SSA's Fintech Market" below).

The adoption of mobile fintech applications—like those for making payments, remittances (international transfers of money), and transfers—represented a rapid and very significant increase in financial inclusion over the past decade (table 7.3). Retail banking penetration in Africa was an estimated 38 percent of GDP in 2018, half of the global average for emerging markets.<sup>1288</sup> Ownership of physical credit cards and debit cards remains much lower in SSA than in OECD countries. However, accounts with mobile money service providers are growing quickly.

**Table 7.3** Financial account ownership, by key market, select years (percent)

Year	Account ownership at a financial institution or with a mobile-money-service provider						Debit card ownership		Credit card ownership		
	OECD	SSA	Ethiopia	Ghana	Kenya	Nigeria	South Africa	OECD	SSA	OECD	SSA

<sup>1282</sup> IMF, "Financial Access Survey 2018," 2018.

<sup>1283</sup> Demirgüç-Kunt et al., "The Global Findex Database 2017," 2018, xi.

<sup>1284</sup> IMF, "Fintech: The Experience So Far," 2019, 44.

<sup>1285</sup> IMF, "Mobile Money Note 2019," 2019.

<sup>1286</sup> Chironga et al., "African Retail Banking's Next Growth Frontier," February 2018.

<sup>1287</sup> Kazeem, "A \$170 Million Funding Round," April 8, 2019.

<sup>1288</sup> Chironga et al., "African Retail Banking's Next Growth Frontier," February 2018.

Year	Account ownership at a financial institution or with a mobile-money-service provider						Debit card ownership		Credit card ownership		
	90.0	23.2	N/A	29.4	42.3	29.7	53.6	61.9	14.6	50.8	2.9
2011	90.0	23.2	N/A	29.4	42.3	29.7	53.6	61.9	14.6	50.8	2.9
2014	94.0	34.2	21.8	40.5	74.7	44.4	70.3	79.7	17.8	52.9	2.7
2017	94.7	42.6	34.8	57.7	81.6	39.7	69.2	84.2	17.7	56.8	3.2

Source: World Bank, "Global Findex Database 2017," 2018. All figures are for ages 15+.

Ghana, Kenya, Rwanda, Tanzania, and Uganda are considered mature fintech markets because they have many registered mobile money accounts. Kenya is especially notable for its widespread use of fintech (table 7.4). In 2016, at least one person used a mobile money application in 96 percent of Kenyan households.<sup>1289</sup> The value of mobile money transactions as a percentage of Kenya's GDP grew from 23 percent in 2009 to 47 percent in 2017.<sup>1290</sup> More than 180,000 mobile money transfer providers offer deposit and withdrawal services,<sup>1291</sup> in contrast, there are only 2,500 ATMs in Kenya.<sup>1292</sup> Ninety percent of transactions on the Kenyan government's payment platform, eCitizen, are made with mobile money.<sup>1293</sup>

**Table 7.4** Financial inclusion indicators by key market, select examples, 2017 (percent)

	OECD	SSA	Ethiopia	Ghana	Kenya	Nigeria	South Africa
Used the internet to pay bills or to buy something online in the past year	69.8	7.6	0.6	7.8	26.1	6.3	14.1
Used a mobile phone or the internet to access an account	53.6	20.8	0.4	35.5	71.8	7.7	20.6
Made or received digital payments in the past year (male)	92.8	39.3	15.9	55.1	83.7	38.0	59.0
Made or received digital payments in the past year (female)	91.5	29.5	8.2	44.0	74.7	20.8	61.1

Source: World Bank, "Global Findex Database 2017," 2018. All figures are for ages 15+.

Growth was also dramatic in Tanzania, where the value of mobile money transactions as a percentage of GDP grew from 2 percent in 2009 to 52 percent in 2017. In Uganda, mobile money transactions surged from 2 percent in 2009 to 62 percent in 2017.<sup>1294</sup> The SSA countries with the highest ratios of mobile money agents to commercial bank branches are Guinea, Mali, Togo, and Zimbabwe. Such ratios in Cameroon, Côte d'Ivoire, Malawi, Madagascar, the Republic of the Congo, Senegal, and Zambia are also growing quickly.<sup>1295</sup> Nigeria has been described as a "sleeping giant," as there are less than 100 mobile money accounts per 1,000 adults (compared to more than 1,000 accounts per 1,000 adults in

<sup>1289</sup> Suri and Jack, "The Long-run Poverty and Gender Impacts of Mobile Money," December 9, 2016.

<sup>1290</sup> IMF, "Mobile Money Note 2019," 2019.

<sup>1291</sup> Government of Kenya, Communications Authority of Kenya, "2016–2017 Annual Report," 2017, vi.

<sup>1292</sup> Government of Kenya, Central Bank of Kenya, "Number of ATMs, ATM Cards, and POS Machines" (accessed August 26, 2019).

<sup>1293</sup> GSMA, "Person-to-Government Payment Digitization," September 2017, 5.

<sup>1294</sup> IMF, "Mobile Money Note 2019," 2019.

<sup>1295</sup> Chironga et al., "Mobile Financial Services in Africa," September 2017.

Ghana).<sup>1296</sup> By one estimate, South Africa, Nigeria, and Kenya had the most active fintech startups in 2018, collectively accounting for 65.2 percent of Africa's total startups.<sup>1297</sup>

Some countries are promoting access to fintech. For example, Niger is trying to expand credit to rural areas by providing credit scores based on mobile money transactions, call records, social media, and data from Google Maps.<sup>1298</sup> In Cameroon, which has high penetration of mobile phones but low use of electronic money accounts, the electricity utility Eneo has started accepting mobile money payments.<sup>1299</sup> By contrast, the growth of fintech in Angola may be limited by the absence of interoperability among the three major mobile money providers.<sup>1300</sup> South Africa has historically had better financial infrastructure, so mobile money is not meeting as critical a need, and some providers have struggled to operate there.<sup>1301</sup>

Many fintech services are provided by mobile money firms in SSA. The two leading mobile money providers are M-Pesa (launched by the British telecom company, Vodafone Group) and MTN Mobile Money (provided by the South African telecom company MTN Group).<sup>1302</sup> Another rapidly growing fintech company is Nigeria's Paga, which lets people send money via phones and pay for online services.<sup>1303</sup> In addition to network operators, some traditional banks in SSA provide fintech services directly (like South Africa's First National Bank) or through partnerships; for example, Kenya's fintech firm, Equitel, is a subsidiary of Equity Bank and uses telecom firm Airtel Kenya as its carrier.<sup>1304</sup> Telecom companies, however, tend to have larger customer bases than banks do: M-Pesa and MTN Mobile Money have an estimated five to 10 times as many clients as FNB and Equitel.<sup>1305</sup> Also, the telecom industry is more concentrated than the banking sector in SSA. By one estimate, Vodafone's Kenyan mobile network operator partner, Safaricom, had 80 percent of Kenya's telecom market when it launched M-Pesa, while Kenya's largest bank has less than a 15 percent market share.<sup>1306</sup>

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<sup>1296</sup> In table 7.3, the World Bank estimated that 57.7 percent of people in Ghana owned an account at a financial institution or with a mobile money service provider in 2017. Chironga et al., "Mobile Financial Services in Africa," September 2017. Angola is similar to Nigeria, and one possible reason is that financial services providers in oil-exporting countries focus less on consumer markets. Also, in table 7.3, the World Bank estimated that 57.7 percent of people in Ghana owned an account at a financial institution or with a mobile money service provider in 2017, so this estimate suggests that those who did have mobile money accounts in Ghana had so many that there were more than 1,000 accounts per 1,000 adults. Chironga et al., "Mobile Financial Services in Africa," September 2017

<sup>1297</sup> Shapshak, "Africa's Fintech Ecosystem Raised \$320m," June 29, 2019.

<sup>1298</sup> IMF, "Fintech: The Experience So Far," 2019, 45.

<sup>1299</sup> IMF, "Fintech: The Experience So Far," 2019, 45.

<sup>1300</sup> IMF, "Fintech: The Experience So Far," 2019, 45.

<sup>1301</sup> Mbele, "Why M-Pesa Failed in South Africa," May 11, 2016; Reuters, "MTN Scraps Mobile Money Business in South Africa," September 15, 2016.

<sup>1302</sup> Chironga et al., "Mobile Financial Services in Africa," September 2017. As of 2019, M-Pesa operated in the Democratic Republic of the Congo, Egypt, Ghana, Kenya, Lesotho, Mozambique, Nigeria, Tanzania, and South Africa. MTN Mobile Money operated in Côte d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Rwanda, Eswatini (formerly Swaziland), Uganda, and Zambia.

<sup>1303</sup> Chironga et al., "Mobile Financial Services in Africa," September 2017.

<sup>1304</sup> Chironga et al., "Mobile Financial Services in Africa," September 2017.

<sup>1305</sup> Chironga et al., "Mobile Financial Services in Africa," September 2017.

<sup>1306</sup> Chironga et al., "Mobile Financial Services in Africa," September 2017.

## Role of U.S. Firms in SSA's Fintech Market

Currently, sub-Saharan Africa is not a large destination for or source of U.S. exports and imports of financial services. However, by one estimate, 50 percent of the international fintech firms operating in SSA are headquartered in the United States and United Kingdom.<sup>1307</sup> Some U.S. fintech firms offer services directly and others do so through partnerships, or as providers of financial infrastructure services. An example of a direct provider is U.S.-based Branch International, which offers its mobile application software for loans and other financial services to customers without bank accounts. The firm operates in Kenya, Nigeria, and Tanzania (as well as India and Mexico), and in 2019 it raised \$170 million in funding.<sup>1308</sup> Its app determines creditworthiness by using smartphone data such as GPS coordinates, call logs, contact lists, and receipts. Another service provider, the California-based microlending mobile firm Tala, entered the market in Kenya in 2014.<sup>1309</sup>

Several U.S. firms have entered SSA's fintech market through investments, acquisitions, and partnerships. In 2015, PayPal bought Xoom for \$890 million, and the money transfer company now operates in 33 African countries.<sup>1310</sup> In 2018, M-Pesa struck a deal with U.S. financial services firm Western Union to expand its global services and allow its customers to pick up transfers at Western Union agent locations.<sup>1311</sup> Also in 2018, U.S. firm Emergent Technology bought Ghana's payments processor, Interpay Africa, for an unknown sum. That same year, Stripe and Visa led an \$8 million round of funding for Nigeria's payments processor Paystack, which is preparing to expand into Ghana.<sup>1312</sup> Mastercard also participated in a \$20 million funding round, in 2018, for Nigeria's payment service Flutterwave.<sup>1313</sup> Some of the investments in SSA fintech services have been from venture capital funds like Silicon Valley's Draper DarkFlow. Additionally, Visa works with the mobile money service Orange Money to provide payment and withdrawal cards in Botswana, Cameroon, and Côte d'Ivoire.<sup>1314</sup> Mastercard is collaborating with Direct Pay Online (DPO) Group, a payment services provider in SSA, to offer virtual debit cards that can be filled with money by using mobile phones.<sup>1315</sup>

Many U.S. firms provide underlying financial technology in SSA. Visa, Mastercard, and Android Pay are developing open application programming interfaces that let financial service providers, e-commerce

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<sup>1307</sup> EY, "FinTechs in Sub-Saharan Africa," 2019.

<sup>1308</sup> Kazeem, "A \$170 Million Funding Round," April 8, 2019.

<sup>1309</sup> Domat, "Fintech Deals and Dollars Sweep through Africa," May 7, 2019.

<sup>1310</sup> Velluet, "PayPal Enters the African Market with Xoom," August 14, 2019.

<sup>1311</sup> Dahir, "Africa's Dominant Mobile Money Service," November 7, 2018.

<sup>1312</sup> Kazeem, "A \$170 Million Funding Round," April 8, 2019. Interpay Africa gives merchants access to international payments services. Paystack lets businesses create payment links that can be shared with their customers.

<sup>1313</sup> Kazeem, "A \$170 Million Funding Round," April 8, 2019. Flutterwave primarily provides business-to-business payment services.

<sup>1314</sup> Orange Money users can use payment and transfer services by depositing money in accounts linked to their mobile phone numbers.

<sup>1315</sup> Mastercard, "Mastercard Partners with DPO Group," December 10, 2018.

platforms, and remittance firms integrate.<sup>1316</sup> Microsoft's cloud services division helped Flutterwave scale up in Nigeria.<sup>1317</sup> Oracle also provides back-end data access services for some SSA fintech firms.<sup>1318</sup>

U.S. firms also support fintech in SSA in other ways.<sup>1319</sup> For example, Goldman Sachs helped South Africa's mobile fintech firm Jumo complete a \$52 million equity funding round.<sup>1320</sup> Mastercard, in partnership with the Bill and Melinda Gates Foundation, set up Mastercard Labs for Financial Inclusion in Nairobi, Kenya.<sup>1321</sup> Visa, Microsoft, and Barclays are leading accelerator programs (which typically include seed investment and mentorship) in Kenya.<sup>1322</sup> JPMorgan Chase worked with the Bill and Melinda Gates Foundation and consulting firm BFA to create BFA's Catalyst Fund, which provides early-stage capital for fintech firms. Google and Facebook have set up training campuses and incubators in Nigeria. The U.S. government has facilitated some initiatives as well. In 2016, Liberia's government partnered with the Mobile Solutions Technical Assistance and Research (mSTAR) project, funded by the U.S. Agency for International Development (USAID), to pay teachers' salaries with mobile money, which reduced costs and travel time.<sup>1323</sup>

## How the Adoption of Fintech Is Affecting Other Sectors

The expansion of fintech in SSA has had profound benefits. One of the most important applications is the transfer of small amounts of money between friends and family, which smooths consumption and makes investment more efficient.<sup>1324</sup> By one 2016 estimate, access to M-Pesa increased daily per capita consumption for Kenyan households, especially households headed by women, and lifted 2 percent of Kenyan households (194,000 people) out of poverty.<sup>1325</sup> Microcredit (the extension of very small loans to low-income borrowers), which can be facilitated by fintech, changes occupational choices and empowers people to start their own companies. For example, microcredit can support the movement of women out of the agricultural sector and into business occupations.<sup>1326</sup>

Some studies have found that access to mobile money helps individuals protect themselves against income and health risks because, in response to negative shocks, they can draw on money more quickly from a wider set of sources.<sup>1327</sup> For example, during the rainy season, health and education workers in Liberia are sometimes cut off from infrastructure, but they can still receive mobile payments.<sup>1328</sup> Fintech

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<sup>1316</sup> O'Keeffe, "Three Fintech Trends for Financial Inclusion," February 20, 2018.

<sup>1317</sup> Techloy, "How Microsoft's 4Afrika Program," July 26, 2018. For more on Microsoft's cloud services in SSA, see case study 7.1 in this chapter.

<sup>1318</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>1319</sup> Visa, "Visa Takes Everywhere Startup Program to Sub-Saharan Africa," March 14, 2018.

<sup>1320</sup> Africa Business Insight, "Venture Capital Investors," October 19, 2018.

<sup>1321</sup> Mastercard, "Fintech Leader Mastercard," May 13, 2019.

<sup>1322</sup> EY, "FinTechs in Sub-Saharan Africa," 2019.

<sup>1323</sup> IMF, "Mobile Money Note 2019," 2019.

<sup>1324</sup> IMF, "Mobile Money Note 2019," 2019.

<sup>1325</sup> Suri and Jack, "The Long-run Poverty and Gender Impacts," December 9, 2016.

<sup>1326</sup> Suri and Jack, "The Long-run Poverty and Gender Impacts," December 9, 2016.

<sup>1327</sup> Suri and Jack, "The Long-run Poverty and Gender Impacts," December 9, 2016.

<sup>1328</sup> IMF, "Fintech in Sub-Saharan African Countries," 2019, 17.

applications also make it easier and less costly for Africans working abroad to send money (remittances) to SSA. In 2017, the average transaction cost of sending remittances to Namibia was 27.6 percent,<sup>1329</sup> but some fintech firms have reduced cross-border transaction fees to below 2 percent.<sup>1330</sup> Fintech also increases access to credit: some SSA representatives say it is easier to get loans through fintech applications than from banks.<sup>1331</sup> In one example, during a recent recession, Nigerian businesses could reportedly access fintech loans easier than bank loans.<sup>1332</sup>

## Policies and Market Conditions Affecting Fintech

### Market Conditions

SSA countries still face challenges in expanding financial inclusion through fintech, including limited infrastructure, low literacy rates, and regulations that make it difficult to provide financial services across borders.<sup>1333</sup> Fintech services like mobile credit and crowdfunding are typically more inclusive than traditional banking services. But even these services still may be inaccessible to some: people with low incomes or little education, people in rural locations, and women (56 percent of the global unbanked are women).<sup>1334</sup> Additionally, unbanked people may have a hard time accurately assessing the risks of borrowing.<sup>1335</sup> Some in Kenya have borrowed money for online betting, and the number of Kenyans blocked by credit bureaus increased from 150,000 in 2015 to 500,000 in 2018.<sup>1336</sup> Finally, SSA fintech services are not universally accepted by international companies; for example, as of 2019, Netflix had not yet accepted M-Pesa payments.<sup>1337</sup>

### Government Policies

Fintech regulations are complex because they try to apply the regulatory goals for the broader financial sector to new, and sometimes untested, technologies. Fintech can increase economic efficiency and expand financial inclusion, but it can also create vulnerabilities: fintech applications can increase the speed, volume, and volatility of financial transactions, yet they can be used as well for criminal activities like money laundering and terrorist financing. Both the benefits and risks can be difficult for regulators to assess.<sup>1338</sup>

Many regulations apply to the financial sector, including “know your customer,” anti-money laundering, cybersecurity, consumer protection, and data privacy regulations (described in table 7.2, “Measures

<sup>1329</sup> World Bank, World Development Indicators, “Average transaction cost of sending remittances” (accessed February 13, 2020).

<sup>1330</sup> Economist, “Fintech Takes Aim at the Steep Cost,” April 11, 2019.

<sup>1331</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>1332</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 3, 2019.

<sup>1333</sup> Murray, “How Developing Nations Use Tech to Reach the ‘Underbanked,’” April 23, 2019.

<sup>1334</sup> Murray, “How Developing Nations Use Tech to Reach the ‘Underbanked,’” April 23, 2019. The term “unbanked” refers to not having a bank account.

<sup>1335</sup> IMF, *Fintech: The Experience So Far*, 2019.

<sup>1336</sup> Economist, “Borrowing by Mobile Phone,” November 17, 2018.

<sup>1337</sup> For more on digital streaming video services in SSA, see case study 7.4 in this chapter.

<sup>1338</sup> IMF, “Fintech in Sub-Saharan African Countries,” 2019, 27.

related to data privacy and cross-border flows in SSA”). Most individual fintech transactions are low in value, but the number of transactions in SSA’s fintech sector may have grown so large that it is now systemically important. Many of the financial services offered on mobile payment platforms are linked to the banking sector, which can create risks related to interconnectedness and financial stability.<sup>1339</sup> In 2017, Kenya’s National Treasury warned that if a major mobile payment service were compromised, it could affect market confidence and pressure the government to compensate for the losses.<sup>1340</sup>

Within SSA there are regional differences in financial regulation. Some East African countries apply telecommunication regulations to fintech firms instead of financial regulations. This means that firms can be exempt from certain regulations that apply to traditional banks, like capital and liquidity buffers, lender-of-last-resort facilities, and deposit insurance.<sup>1341</sup> For example, M-Pesa initially applied for approval from Kenya’s telecommunications authority, not from Kenya’s Central Bank, which regulates deposit-taking entities.<sup>1342</sup> Kenya’s National Payment System Regulations, which cover licensed telecom providers, require them to maintain liquid assets equal to the amount of money issued digitally; that money is held by a bank in the name of the mobile network operator.<sup>1343</sup>

Some observers believe telecom-led regulatory models have been more successful at promoting fintech growth and innovation than have bank-led regulatory models,<sup>1344</sup> though others interpret this success as evidence that regulations were lagging behind the development of fintech.<sup>1345</sup> Other countries have different regulatory environments. Nigeria is reportedly concerned about payment companies developing monopolies, and its Central Bank, not its Communications Commission, regulates mobile money.<sup>1346</sup> Countries like Mauritius, Mozambique, and Sierra Leone have fintech “sandboxes”<sup>1347</sup> with fewer regulatory requirements. Another complexity is that some SSA countries’ regulations concentrate on financial entities, while others (like those of South Africa) concentrate on financial activities.<sup>1348</sup>

Some financial regulators in SSA are encouraging the growth of fintech. In 2012, the Central Bank of Nigeria introduced policies to support cashless transactions and reduce the volume of money in circulation.<sup>1349</sup> They are working with Nigeria’s Inter-Bank Settlement System to develop a data warehouse and dashboards (which visually track and display data) that will monitor financial risk and provide data to stakeholders.<sup>1350</sup> Ineffective interoperability regulations can restrict transfers of money,<sup>1351</sup> but Tanzania and Nigeria have required interoperability between mobile wallets.<sup>1352</sup> The

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<sup>1339</sup> Khiaonarong, “Oversight Issues in Mobile Payments,” July 2014.

<sup>1340</sup> Government of Kenya, National Treasury, “2017 Budget Policy Statement,” November 2016, 83.

<sup>1341</sup> IMF, “Fintech in Sub-Saharan African Countries,” 2019, 28.

<sup>1342</sup> Bowmans, “Fintech in Africa,” 2017, 8.

<sup>1343</sup> IMF, “Fintech in Sub-Saharan African Countries,” 2019, 27.

<sup>1344</sup> IMF, “Fintech in Sub-Saharan African Countries,” 2019, 9.

<sup>1345</sup> Didenko, “Regulating Fintech,” June 15, 2018, 362.

<sup>1346</sup> Bowmans, “Fintech in Africa,” 2017, 8.

<sup>1347</sup> A regulatory sandbox is a controlled environment where startups can experiment with new technologies and business models under a regulator’s supervision.

<sup>1348</sup> Bowmans, “Fintech in Africa,” 2017, 12.

<sup>1349</sup> Oloketuyi, “African Fintech Startups Are Revolutionizing Banking,” March 17, 2018.

<sup>1350</sup> Di Castri, Grasser, and Kulenkampff, “Financial Authorities in the Era of Data Abundance,” 2018, 37.

<sup>1351</sup> United Nations Economic Commission for Africa, “ECA Policy Brief,” 2018.

<sup>1352</sup> O’Keeffe, “Three Fintech Trends for Financial Inclusion in Sub-Saharan Africa,” February 20, 2018.

National Bank of Rwanda has automated the reporting process for 600 banks, microfinance institutions, and savings and credit cooperatives.<sup>1353</sup>

One way to encourage new fintech firms is for countries to provide the regulatory sandboxes referred to above, which temporarily relax the regulatory requirements on startups. This lowers the barriers to entry for firms that do not have the resources to maintain compliance teams. Kenya’s Capital Markets Authority accepted 3 applications from fintech firms to use a regulatory sandbox in 2019.<sup>1354</sup> The authority hopes to use the sandbox to accelerate its understanding of emerging financial technologies.

## Case Study 7.3: E-commerce in SSA

### Key Findings

This case study provides an overview of the SSA business-to-consumer (B2C) e-commerce market.<sup>1355</sup> It highlights the key markets of Nigeria and South Africa (home to the region’s leading e-commerce platforms) and examines barriers and challenges in the unique SSA e-commerce environment. Africa is a small but rapidly growing e-commerce market, led by Nigeria and South Africa. Deficiencies in delivery logistics and payments, including a lack of the related services needed to support e-commerce, are a significant impediment, requiring a unique business model employed by indigenous firms. These services, which were critical to the rapid expansion of e-commerce in the United States and other developed countries, have limited the role of U.S. and other global e-commerce platforms in SSA.

### Overview of the SSA E-commerce Market

Africa is one of the world’s fastest-growing e-commerce markets globally, but total market value is still relatively small. Online retail sales in the Africa and the Middle East region grew 21.3 percent in 2019, similar to online sales growth in the Asia-Pacific region (25.0 percent), but well above growth in North America (14.5 percent) and Western Europe (10.2 percent).<sup>1356</sup> Estimates of the value of the SSA B2C market vary because of different geographic coverage. One leading market research firm estimated that SSA B2C e-commerce sales were \$10.2 billion in 2019.<sup>1357</sup> Another source estimated that Africa and the Middle East had a combined B2C e-commerce market value of \$19 billion in 2019, ranking it as one of the smallest regional e-commerce markets by sales value (figure 7.5).

<sup>1353</sup> IMF, “Fintech in Sub-Saharan African Countries,” 2019, 35.

<sup>1354</sup> Ventureburn, “Kenya’s CMA Admits Three Fintechs,” August 1, 2019; Didenko, “Regulating Fintech,” June 15, 2018, 354.

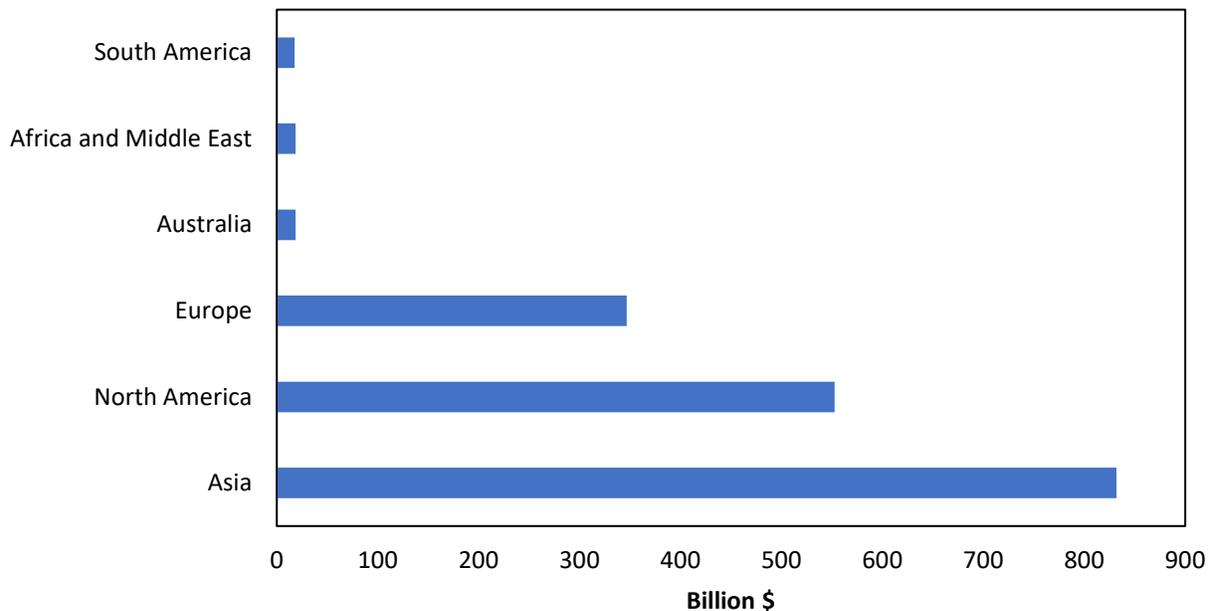
<sup>1355</sup> The focus of this case study is on business-to-consumer (B2C) e-commerce, which are online retail sales. But much of the discussion also applies to the business-to-business (B2B) market, which operates in the same e-commerce ecosystem.

<sup>1356</sup> BCG, “How Online Marketplaces Can Power Employment in Africa,” March 26, 2019. Africa includes the Middle East region in eMarketer data. eMarketer, *Global E-commerce, 2019*, June 27, 2019.

<sup>1357</sup> Fitch Solutions, “Global E-commerce,” 2019, 71. eMarketer estimates that the total global value of B2C e-commerce was \$3.5 trillion in 2019, so Africa represents a very small share of the global market value. eMarketer, *Global E-commerce, 2019*, June 27, 2019.

E-commerce accounts for a small share of total retail sales in Africa—1 to 2 percent by country, compared to 14 percent in the United States and nearly 25 percent in China.<sup>1358</sup> Nigeria, South Africa, and Kenya made up over half of the 21 million online SSA shoppers in 2017.<sup>1359</sup> However, McKinsey has estimated that by 2025, e-commerce will account for 10 percent of total retail sales in Africa’s largest economies.<sup>1360</sup>

**Figure 7.5** Estimated B2C E-commerce market value by region, 2019 (billion dollars)



Source: Orendorff, “Global E-commerce Statistics,” February 14, 2019.  
 Note: See appendix table I.11 for a tabular presentation of the data in this figure.

Several factors point toward growth in e-commerce in SSA. First, SSA’s large population is over 1 billion people with 400 million connected to the internet, primarily through mobile phones, which is driving e-commerce growth.<sup>1361</sup> Second, nearly half of that population is composed of people in their prime consuming years, whose ages range from 15 to 54 years old. Many of these relatively young consumers are coming online with widely available inexpensive smartphones and feature phones (see box 7.1).<sup>1362</sup> Third, there is a rapidly emerging middle class, which is forecast to grow by over 50 percent in the next

<sup>1358</sup> Statista, “E-commerce in the United States,” 2019, and “E-commerce in China,” 2019; Hootsuite, “Digital 2019, Nigeria,” February 3, 2019. Online shopping in Africa represented just 2 percent of total retail sales in the region in 2017, and according to one source will not increase significantly in next few years. IPC, “State of E-commerce: Global Outlook 2016–21,” 2017.

<sup>1359</sup> Kazeem, “E-commerce Is Thriving in Africa,” December 13, 2018.

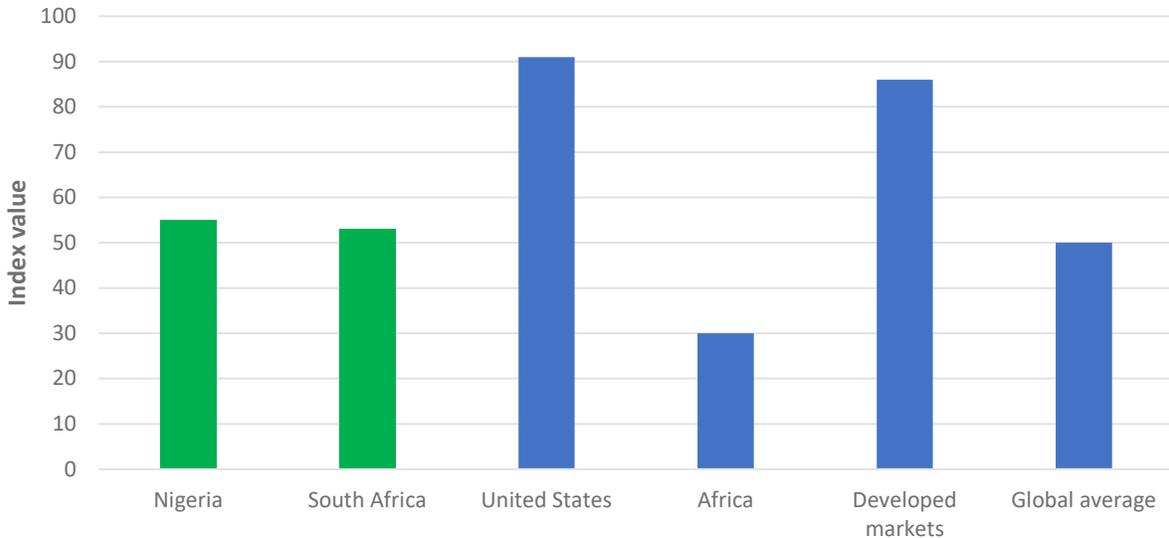
<sup>1360</sup> Hattingh, Leke, and Russo, “Lions (Still) on the Move,” October 2017.

<sup>1361</sup> McKinsey, “How E-commerce Supports African Business Growth,” January 2019.

<sup>1362</sup> Ericsson, “Regional Subscriptions Outlook,” June 2019.

decade.<sup>1363</sup> At present, though, when measured by UNCTAD’s e-commerce readiness index,<sup>1364</sup> Africa’s average score of 30 ranks at the bottom of major global regions and well below the global average (50), and much below the average for developed economies (86) and the United States (91) (figure 7.6). However, Nigeria (55) and South Africa (53), home to the continent’s leading e-commerce platforms, have the highest e-commerce scores in Africa, ranking them above the global average.

**Figure 7.6** United Nations Conference on Trade and Development (UNCTAD), e-commerce readiness index values, 2017



Source UNCTAD, “B2C E-commerce Index 2018,” 2018.

Note: UNCTAD includes U.S., Canada, Western Europe, Australia, Japan, Australia, and New Zealand as developed markets. UNCTAD, “Classifications” (accessed February 18, 2020). See appendix table I.12 for a tabular presentation of the data in this figure.

<sup>1363</sup> IT News Africa, “The Future of E-commerce in Africa,” February 12, 2019; E-commerce Foundation, “African E-commerce Report, 2018,” 2018, 11.

<sup>1364</sup> The UNCTAD B2C index measures four factors in each country: share of individuals using the internet; share of individuals with an account at a financial institution; postal reliability; and number of secure servers per 1 million population. UNCTAD, “UNCTAD B2C E-commerce Index 2018: Focus on Africa,” 2018.

**Box 7.1 Smart Feature Phones**

The rise of internet-enabled phones globally means that for many new internet users, including those in sub-Saharan Africa (SSA), their first experience with internet-based services such as financial technology (fintech) or e-commerce comes via mobile devices.<sup>a</sup> Mobile phones are broadly categorized into two groups: feature phones, which allow for calling, text messages, and limited internet access, but are not generally compatible with mobile applications; and smartphones, which are essentially handheld computers.<sup>b</sup> As of 2019, 61 percent of mobile phones in Africa were feature phones<sup>c</sup> while 39 percent were smartphones.<sup>d</sup> Worldwide, one-third of all feature phone shipments went to the Middle East and Africa region in the first quarter of 2019.<sup>e</sup>

In recent years, “smart feature phones” have begun to bridge the gap between smart and feature phones. This hybrid represents a potential future opportunity in SSA markets. Smart feature phones are an improvement on a typical feature phone, but are more affordable than a full smartphone, at around \$25 dollars in 2019 (compared to \$300 on average for a smartphone).<sup>f</sup> Smart feature phones include operating systems that can support high-speed internet access and HTML-based applications, and are intended to operate on 3G/4G networks. Industry sources expect that smart feature phone sales will grow to \$28 billion globally by 2021.<sup>g</sup>

The decreasing cost of mobile data may make it easier for feature phone users to increase their internet use and promote adoption of smart feature phones in the key SSA markets. Table 7.5 shows the average price of mobile phone plans including at least 500 megabytes (MB) of mobile data per month from 2013 to 2017 for the key markets in this report.<sup>h</sup> On average, over this five-year period, the cost of a phone plan with at least 500 MB of mobile data shrank from \$14 per month to only \$4 per month, with the largest declines in price occurring in Côte d’Ivoire. More recently, a study from United Kingdom (UK) broadband provider Cable gathered information on the average price of 1 GB (gigabyte) of mobile data in 2018. Cable found that the average price of 1 GB of data in the key markets (\$3.04) was below both the average for all of SSA (\$10.69) and the world average (\$8.53).<sup>i</sup>

**Table 7.5** Mobile broadband cost for 500 MB per month (dollars)

Country	2013	2014	2015	2016	2017
Nigeria	12.71	12.19	10.91	3.94	3.27
Ethiopia	n.a.	6.62	9.65	4.22	3.87
Côte d’Ivoire	30.36	10.11	9.98	8.68	3.44
Ghana	8.19	6.6	5.24	5.51	2.76
Kenya	5.81	5.69	5.46	4.93	4.84
Rwanda	7.73	7.35	1.39	2.54	2.41
South Africa	16.47	9.12	7.76	6.73	7.42
SSA Average	13.55	8.24	7.20	5.22	4.00

Source: ITU, “ICT Price Baskets (IPB)” (accessed September 20, 2019).

Notes: Cost represents the least expensive phone plan that included at least 500 MB of mobile data per month in each country. Data were not available for Ethiopia in 2013.

Although the largest U.S. smartphone manufacturer, Apple, currently does not produce smart feature phones, U.S. app developers are seeking to gain market share by adapting their applications to run on these devices. U.S. firm KaiOS has developed a web-based operating system (OS) designed for smart feature phones.<sup>j</sup> KaiOS represented 0.7 percent of the global mobile OS market in 2018, and runs on more than 100 million devices.<sup>k</sup> In SSA, KaiOS has partnered with MTN, a South African-based multinational mobile telecommunications company, to launch smart feature phones in South Africa and Nigeria, and with Orange, a French multinational telecommunications corporation, to launch phones in Mali, Burkina Faso, and Côte d’Ivoire.<sup>l</sup> Google is a major investor in KaiOS, a connection which has helped facilitate the development of Google apps that work on the operating system.<sup>m</sup>

<sup>a</sup> Sengupta, “The Next Billion Users,” February 14, 2018.

<sup>b</sup> Counterpoint, “Q1-2019 Mobile Market Monitor,” June 4, 2019.

<sup>c</sup> Counterpoint, “Q1-2019 Mobile Market Monitor,” June 4, 2019; Sadeque, “Smartphones Lost Market Share,” February 14, 2018.

<sup>d</sup> GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2020, 7. However the smartphone ownership statistics may be inflated since there are not clear differences between low-end smartphones and higher-end feature phones.

<sup>e</sup> Data are not disaggregated further than Middle East and Africa. Counterpoint, “Q1-2019 Mobile Market Monitor,” June 4, 2019; Sadeque, “Smartphones Lost Market Share,” February 14, 2018.

<sup>f</sup> Purnell, “The Hottest Phones for the Next Billion Users,” July 23, 2019.

<sup>g</sup> Counterpoint, “Smart Feature Phones,” February 18, 2019.

<sup>h</sup> For a description of methodology used to calculate this statistic, see ITU, *Measuring the Information Society Report 2015*, 2015.

<sup>i</sup> Cable, “Worldwide Mobile Data Pricing,” March 5, 2019.

<sup>j</sup> Operating systems are the underlying software that allows users to interact with computers, and include software like Microsoft Windows for desktop computers, and Google Android for mobile devices. Bloomberg, “KaiOS Technologies Inc.” (accessed September 20, 2019); Warren, “Google Invests \$22 Million,” June 28, 2019.

<sup>k</sup> Statcounter, “Mobile Operating System Market Share Worldwide,” August 2019; KaiOS, “Who We Are,” <https://www.kaiostech.com/our-story> (accessed September 9, 2019).

<sup>l</sup> Dahir, “Smart Feature Phones with ‘Light’ Operating Systems,” February 26, 2019.

<sup>m</sup> Warren, “Google Invests \$22 Million,” June 28, 2019.

Because of the many challenges, SSA e-commerce firms use “localized approaches to payment, delivery, and marketing.”<sup>1365</sup> There were an estimated 264 indigenous African e-commerce platforms operating in at least 23 African countries in 2017.<sup>1366</sup> All these firms are regionally focused, catering primarily to SSA consumers,<sup>1367</sup> and employ business models that work to address deficiencies in payments and logistics on the continent. For example, the e-commerce firm Jumia has developed its business model to address many of SSA’s e-commerce challenges (see box 7.2).<sup>1368</sup> Some of the leading African e-commerce firms operate in multiple SSA markets, having adapted their home-market models to expand into other SSA countries.<sup>1369</sup> E-commerce firms based in Nigeria, South Africa, and Kenya are at the forefront of the rapidly evolving industry (table 7.6).<sup>1370</sup> Most are third-party marketplaces that match sellers and buyers (i.e., the platforms do not own the products that they sell), and most are not yet profitable but investing to expand.<sup>1371</sup> Although African e-commerce platforms are mostly indigenous, they rely heavily on international investment.<sup>1372</sup> For example, Jumia raised significant capital (\$196 million) through an initial public offering on the New York Stock Exchange in 2019.<sup>1373</sup>

<sup>1365</sup> Booth, “Africa’s Untapped Potential as an E-commerce Market,” July 16, 2019.

<sup>1366</sup> ITC and WEF, *Africa E-Commerce Agenda*, September 2019, 4.

<sup>1367</sup> USAID, “E-commerce Development Survey and Index,” April 2017, 6.

<sup>1368</sup> Weigart, “How the Private Sector Is Shaping African E-commerce,” March 14, 2018.

<sup>1369</sup> Weigart, “How the Private Sector Is Shaping African E-commerce,” March 14, 2018.

<sup>1370</sup> SLA, “Growth of E-commerce” (accessed August 8, 2019).

<sup>1371</sup> Kim Reid, “The Science of . . . ‘We’re Not Breaking Even Yet’” (interview by Bruce Whitfield), February 26, 2019.

<sup>1372</sup> ITC and WEF, *International E-commerce in Africa*, 2015, 5.

<sup>1373</sup> *Bloomberg News*, “Jumia Raises \$196 Million for Its IPO,” April 12, 2019.

**Table 7.6** Leading SSA e-commerce platforms

<b>Firm</b>	<b>Revenues, 2018 (million \$)</b>	<b>Headquarters</b>	<b>Number of markets active</b>	<b>Year founded</b>	<b>Business model</b>
Jumia	\$149.6	Lagos, Nigeria	11 (including North Africa)	2011	Third-party market
Takealot	\$250.0	Cape Town, South Africa	1 (primarily South Africa)	2002	Stocks its own products (83%) and third-party market (17%)
MallforAfrica	\$20.0	Kano, Nigeria,	3 (Nigeria, Ghana, Kenya)	2012	Third-party market; including large international brands
Konga	\$3.5	Lagos, Nigeria	1 (primarily Nigeria)	2012	
Kilimall	n.a.	Nairobi, Kenya	3 (Kenya, Uganda, Nigeria)	2014	Third-party seller of Chinese and African goods

Source: Compiled by USITC staff using data from company profiles at owler.com (accessed October 20, 2019).

Note: n.a. = not available.

### **Box 7.2** Jumia: SSA's Leading E-commerce Firm

Jumia is the largest e-commerce platform in sub-Saharan Africa (SSA) by the number of markets served<sup>a</sup> and employees. The firm has designed its business model to meet payments and logistics challenges in the African e-commerce market.<sup>b</sup> Established in 2012, Nigeria-based Jumia operates as a third-party marketplace business model<sup>c</sup> (similar to eBay) where sellers list products on its website and connect with buyers. Jumia earns income through sales commissions.<sup>d</sup> (This model contrasts with SSA's other leading online marketplace, South Africa's Takealot, which operates primarily in South Africa and owns many of the products it sells). While Jumia initially sold mostly higher-value electronics, it has branched out to offer a variety of fashion and other consumer products (including large corporate brands).<sup>e</sup> The platform hosts smaller local distributors of larger brands (including appliances) as well as cross-border sellers, primarily from China.<sup>f</sup> Jumia also offers services such as food deliveries, travel services, payment services, and marketing services.<sup>g</sup>

The number of active Jumia customers grew from 2.7 million in 2017 to 5.5 million in 2019,<sup>h</sup> but as with many digital startups, rising sales and revenues have not yet covered operating expenses. For example, during 2017–18, revenues and gross value of merchandise sold increased 42 percent and 69 percent, respectively; however, operating losses also increased 11 percent during the period. Such losses are not unusual for digital startups that invest aggressively in order to build market share (table 7.7).

A major obstacle to e-commerce in SSA is a lack of consumer trust in online transactions. Some SSA consumers fear being scammed and are thus reluctant to share their personal information online.<sup>i</sup> To develop trust, Jumia offers customers a cash-on-delivery (COD) payment option, which is viewed by the firm as an important marketing tool for building customer confidence.<sup>j</sup> The COD payment option also attracts many buyers who do not have traditional bank accounts and who may not be able to prepay for online orders. However, COD payment results in a higher product return rate and is costlier for firms to implement than digital payment processing.<sup>k</sup>

**Table 7.7** Jumia: Revenues, gross merchandise value, and operating losses, 2018, 2019

	2017	2018	Change 2017–18
		Million \$	% change
Revenues	106	150	41.5
Gross merchandise value	577	977	69.3
Operating losses	-175	-194	-11.9

Source: Statista, using IMF exchange rate data.

Jumia must also navigate the extremely challenging SSA logistics environment. In contrast to the United States, where e-commerce firms rely on the highly developed logistics infrastructure (including the U.S. Postal Service and global providers such as UPS and FedEx), SSA's logistics environment is underdeveloped. To reach its extensive and geographically diverse SSA customers, Jumia partners with local third-party logistics providers (3PLs)<sup>l</sup> and leverages its digital capacity, including delivery algorithms, while relying on 3PLs to contribute local knowledge in subnational SSA markets.<sup>m</sup> Jumia operates warehouses and distribution hubs, including pickup and drop-off stations, in coordination with their sellers and 3PLs, which lowers the cost of last-mile delivery.<sup>n</sup> In addition, Jumia works with 3PLs to invest in delivery technologies and assets such as vans and motorbikes.<sup>o</sup>

Jumia's payment service, JumiaPay, currently operates in six African countries and is a growing revenue source for the company.<sup>p</sup> Originally developed to facilitate digital payments on its platform, JumiaPay is also targeting the larger payments market to handle off-platform payments, including point-of-sales applications that use Quick Response (QR) codes and other types of online payments, such as those for utility bills and mobile data services.<sup>q</sup> Given the many challenges of selling goods through e-commerce in SSA, Jumia views its payments service as an important part of its business plan in the future.<sup>r</sup>

<sup>a</sup> As of March 2020, Jumia operates in 11 African markets (including 7 in SSA), down from a high of 14, having recently closed its e-commerce operations in Cameroon and Tanzania. Kazeem, "Jumia's Has Shut Down Operations," November 28, 2019; Henry, "After Cameroon, Jumia Abandons Yet Another African Market," November 28, 2019; Munshi, "Africa's Amazon Hopeful Jumia Retreats," December 9, 2019; Jumia website <https://group.jumia.com/> (accessed March 16, 2020).

<sup>b</sup> Jumia is the second-largest African e-commerce company after Takealot based on revenues. The gross value of Jumia's merchandise sales was \$948.8 million in 2018. Munarriz, "Jumia Is Not the Mercado Libre of Africa," May 15, 2019.

<sup>c</sup> Third-party e-commerce marketplaces match sellers and buyers. They do not own the merchandise they sell.

<sup>d</sup> In addition to matching buyers and sellers, eBay is also an auction website, where buyers bid on products.

<sup>e</sup> Operating in multiple African countries has allowed Jumia to enter partnerships with large brands such as Pernod Ricard, Unilever, P&G, Mastercard, and Chinese mobile phone maker Xiaomi. Atabong, "Jumia's Cameroon Exit Could Be the First Step," November 19, 2019; industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>f</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>g</sup> Jumia website <https://www.jumia.com.ng/> (accessed February 14, 2020); industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>h</sup> Statista, "Active Customers of Jumia," November 21, 2019.

<sup>i</sup> Munshi, "Jumia's Rise Exposes Challenges," May 5, 2019.

<sup>j</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>k</sup> Garcia, "5 Things about Newly-Public African E-commerce Site Jumia," April 14, 2019; Bright, "Pan-African E-tailer Jumia," November 12, 2019.

<sup>l</sup> IT News Africa, "Jumia Building Tomorrow's African Infrastructure," June 20, 2018.

<sup>m</sup> SEC, "Jumia Technologies AG, Form F-1," March 12, 2019, 6; IT News Africa, "The Future of E-commerce in Africa," February 12, 2019.

<sup>n</sup> Industry representative, interview by USITC staff, Lagos Nigeria, September 2, 2019.

<sup>o</sup> IT News Africa, "Jumia Building Tomorrow's African Infrastructure," June 20, 2018.

<sup>p</sup> Jumia, "Jumia Reports Third Quarter 2019 Results," November 12, 2019.

<sup>q</sup> Kazeem, "Jumia Is Shipping Bigger Losses," November 13, 2019; Kazeem, "Jumia Wants to Spin Off Its Payments Business," August 22, 2018; Jumia, "Jumia Reports Third Quarter 2019 Results," November 12, 2019.

<sup>r</sup> Jumia, "Jumia Reports Third Quarter 2019 Results," November 12, 2019.

## The Role of U.S. Firms Supplying E-commerce Services

The role of U.S. and other global e-commerce platforms in SSA is limited. These platforms access international markets by tapping into existing logistics and financial infrastructure. However, in SSA, many of these essential services are not available, are underdeveloped, or operate on a different model.<sup>1374</sup> Whereas U.S. e-commerce firms have the technological know-how and resources to enter the SSA market, they lack local knowledge of the African e-commerce model, particularly with respect to payments and delivery.<sup>1375</sup> To the extent that U.S. and other foreign firms participate in the SSA e-commerce market, they either provide services cross-border or enter into partnerships with local and regional e-commerce firms. Given the unique complexities of the SSA market, partnerships reduce market risks, as indigenous firms have local market expertise.<sup>1376</sup>

Both eBay and PayPal have entered into partnerships with SSA e-commerce firms. eBay is partnering with MallforAfrica to sell handmade African products from Nigeria, South Africa, Kenya, and other SSA countries to the United States and other non-SSA countries.<sup>1377</sup> Artisans in SSA make and package products for export and drop them off at DHL distribution/collection centers. This model for outbound e-commerce flows does not face the same payment and logistics barriers as inbound sales. In South Africa, eBay captured just under 10 percent of online traffic for general merchandise websites in 2016.<sup>1378</sup> PayPal provides payment services in 43 African countries,<sup>1379</sup> but does not have offices in the region (i.e., it has no physical footprint in Africa). While the firm handles about 7 percent of South African e-commerce transactions,<sup>1380</sup> it is limited in most other SSA markets. However, the firm is looking to expand payment services by partnering with local mobile money providers in the region.<sup>1381</sup> For example, PayPal is partnering with Safaricom's M-Pesa, the popular mobile money service that allows Kenyan businesses and consumers to transfer money between accounts to gain access to e-commerce platforms that accept payments through PayPal.<sup>1382</sup>

Amazon provides e-commerce services to South Africa, Nigeria, Kenya, and a few other large economies in SSA through its Global Platform.<sup>1383</sup> This service provides fewer product choices and has some additional restrictions not present in more developed markets, particularly on a product's size and weight. In addition, delivery costs are higher, generally using air freight, and vary by SSA market.<sup>1384</sup> Because of the higher relative cost of purchasing from Amazon, their market share is relatively small

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<sup>1374</sup> Weigart, "How the Private Sector Is Shaping African E-commerce," March 14, 2018, 3.

<sup>1375</sup> Weigart, "How the Private Sector Is Shaping African E-commerce," March 14, 2018, 3.

<sup>1376</sup> Global e-commerce firms have experience rolling out new technologies and capital to invest. Weigart, "How the Private Sector Is Shaping African E-commerce," March 14, 2018, 3.

<sup>1377</sup> Steiner, "eBay Opens Door to African Sellers," August 22, 2017.

<sup>1378</sup> Data from Naspers, *Integrated Annual Report 2017, 2017*; Goga, "Online Retailing in South Africa," March 2019, 16.

<sup>1379</sup> Including North Africa. PayPal, "We Get Where You're Coming From" (accessed October 22, 2019).

<sup>1380</sup> Davis, "What Does the Current South African E-commerce Landscape Look Like?" April 7, 2019.

<sup>1381</sup> Gupta, "Inside PayPal's African Expansion Plan," March 14, 2019.

<sup>1382</sup> Dahir, "M-Pesa and PayPal Are Partnering to Boost E-commerce in Kenya," April 20, 2018.

<sup>1383</sup> Amazon, "AmazonGlobal Export Countries and Regions,"

[https://smile.amazon.com/gp/help/customer/display.html/ref=ftinfo\\_dp ?ie=UTF8&nodeId=201074230&sa-no-redirect=1](https://smile.amazon.com/gp/help/customer/display.html/ref=ftinfo_dp ?ie=UTF8&nodeId=201074230&sa-no-redirect=1) (accessed October 21, 2019).

<sup>1384</sup> Goga, "Online Retailing in South Africa," March 2019, 17.

compared to SSA-based e-commerce suppliers. Moreover, Amazon does not provide the same level of delivery and customer services as in more developed markets, such as Prime and one- and two-day delivery options, which also limits its competitiveness in South Africa and other SSA markets.<sup>1385</sup> Amazon's largest SSA market is South Africa, with an e-commerce traffic share of 21 percent in 2016.<sup>1386</sup> Amazon was reported to be the third most visited e-commerce website in South Africa in 2018.<sup>1387</sup>

## How the Adoption of E-commerce Affects Other Sectors

E-commerce operates in a complex ecosystem that includes manufacturers, merchants, logistics and distribution agents, and financial services providers, among others.<sup>1388</sup> The economic development potential of the industry has been noted by African governments and nongovernmental organizations (NGOs). E-commerce firms can help SSA countries make the transition away from the informal economy, boost employment,<sup>1389</sup> spur local manufacturing and services growth, and particularly benefit SMEs.<sup>1390</sup> For example, SSA artisanal producers of art, jewelry, clothing, and fashion, among other products, can access and sell products to U.S. and global customers through online platforms.<sup>1391</sup> E-commerce also provides opportunities for logistics and delivery services. For instance, Jumia employs over 100 local third-party logistics providers in SSA.<sup>1392</sup> One industry source notes that the growth of e-commerce globally presents myriad opportunities for U.S. express delivery firms.<sup>1393</sup> Although payment by COD is currently an important component of SSA e-commerce, financial services are critical to boosting the growth of SSA e-commerce transactions. Among these financial services are bank transfers (known as electronic funds transfer, or EFT), credit cards, and e-payment services such as M-Pesa and JumiaPay, which are gaining market share in SSA e-commerce.<sup>1394</sup>

<sup>1385</sup> Goga, "Online Retailing in South Africa," March 2019, 17.

<sup>1386</sup> That is, Amazon had 21 percent of the visitors to e-commerce general merchandise websites operated in South Africa. Data from Naspers, *Annual Integrated Report 2017, 2017*; Goga, "Online Retailing in South Africa," March 2019, 16.

<sup>1387</sup> USDOC, Export.gov, "South Africa, E-commerce," July 14, 2019.

<sup>1388</sup> BCG, "How Online Marketplaces Can Power Employment in Africa," March 26, 2019.

<sup>1389</sup> BCG, "How Online Marketplaces Can Power Employment in Africa," March 26, 2019; International Trade Centre, *International E-commerce in Africa*, 2015. The informal economy is the part of the economy that is neither regulated nor taxed by the government.

<sup>1390</sup> ICTSD, "How Should Africa Engage in E-commerce?" March 14, 2018; International Trade Centre, *International E-commerce in Africa*, 2015.

<sup>1391</sup> eBay, "eBay Partners with Mall for Africa," August 22, 2017.

<sup>1392</sup> SEC, "Jumia Technologies Registration Statement Form F-1," March 12, 2019.

<sup>1393</sup> This source also notes that licensing restrictions in certain SSA markets hinder further U.S. participation in this sector. Express Association of America, written submission to the USITC, August 16, 2019.

<sup>1394</sup> African Payment Solutions, "The African e-Commerce, and e-Commerce Payments Market," August 30, 2019; Kazeem, "Jumia Is Shipping Bigger Losses," November 13, 2019.

## Policies and Market Conditions Affecting E-commerce

Firms operating in SSA e-commerce markets face many challenges that are substantially different than those faced by firms in developed-country markets. In particular, they face economic underdevelopment and a lack of important support services needed to facilitate e-commerce. These challenges have significantly limited the participation of U.S. and other global platforms in SSA markets.<sup>1395</sup> E-commerce is also affected by underdeveloped digital and e-commerce policies including consumer e-transaction and consumer protection laws, which vary by country (see table 7.2, “Measures related to data privacy and cross-border flows in SSA” in the overview). But as the primary challenges facing e-commerce in SSA have to do with deficiencies in logistics and payments infrastructure, gaps in government policies play a lesser role in e-commerce than in other digital sectors.

### Market Conditions

Logistics and delivery present major challenges for SSA e-commerce suppliers. Compared to most global markets, SSA has too few roads, and many are unpaved. Last-mile delivery is “exorbitantly” expensive, and most deliveries are made by bicycle or motorbike.<sup>1396</sup> E-commerce firms must also deal with a large number of hyper-localized delivery and logistics firms that operate in small subnational markets. Adding to the challenge, the postal infrastructure in most SSA countries is rudimentary.<sup>1397</sup> The absence of national street address systems and lack of postal addresses in many SSA markets often requires e-commerce delivery workers and customers to stay in constant contact by mobile phone on delivery days.<sup>1398</sup> This lack of logistics infrastructure also limits participation from global logistics delivery firms.<sup>1399</sup> DHL and UPS have only a small volume of package deliveries in Africa.<sup>1400</sup>

Income and banking constraints are also major challenges for e-commerce firms in SSA. This requires suppliers to use a payment model that is very different from U.S. e-commerce practices. Owing to the low shares of the population with bank accounts and credit cards, and low consumer trust in online purchases,<sup>1401</sup> payment by cash is commonplace.<sup>1402</sup> Consequently, Africa’s e-commerce platforms are designed to accommodate COD payments, which account for a substantial share of transactions.<sup>1403</sup> In Nigeria, over 70 percent of e-commerce purchases are paid for with cash.<sup>1404</sup> Moreover, online shopping is out of reach for most of the SSA population whose low disposable income is primarily used for basic

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<sup>1395</sup> ICTSD, “How Should Africa Engage in E-commerce?” March 2018.

<sup>1396</sup> Kaplan, Marcia, “Africa: An Emerging Ecommerce Market with Many Challenges,” June 13, 2018.

<sup>1397</sup> Paquette, “The ‘Amazon of Africa’ Faces a Big Challenge,” August 3, 2019; McKinsey & Company, “How E-commerce Supports African Business Growth,” January 2019; government representatives, interview by USITC staff, September 10, 2019.

<sup>1398</sup> Kaplan, “Africa: An Emerging Ecommerce Market,” June 13, 2018.

<sup>1399</sup> Kaplan, “Africa: An Emerging Ecommerce Market,” June 13, 2018.

<sup>1400</sup> These global delivery firms only provide prepaid shipping. Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>1401</sup> International Trade Center and WEF, *Africa E-Commerce Agenda*, September 2019, 4.

<sup>1402</sup> IT News Africa, “The Future of E-commerce in Africa,” February 12, 2019.

<sup>1403</sup> Government representatives, interview by USITC staff, September 10, 2019.

<sup>1404</sup> McKinsey & Company, “How E-commerce Supports African Business Growth,” January 2019.

necessities. One source noted that many African consumers earn and spend income on a daily basis. Unlike U.S. consumers, they cannot prepay with a credit card; instead, they save money for their online purchase during the delivery window to pay cash on delivery.<sup>1405</sup> While mobile money such as M-Pesa—which is highly developed in Kenya and other East African markets—partially addresses the financial inclusion challenge, it does not address households’ income constraints.<sup>1406</sup>

## Government Policies

Regulations in SSA countries have not kept pace with the advancement of digital technologies.<sup>1407</sup> Most SSA countries lack the regulatory and legal frameworks for online transactions, including for electronic contracts, digital signatures, consumer protection, and intellectual property rights.<sup>1408</sup> One industry representative noted that there are few government policies that promote e-commerce,<sup>1409</sup> although African governments have expressed concern about the need to do so.<sup>1410</sup> Some government representatives have stated that it would be more beneficial to first establish their national digital regulatory frameworks governing the digital economy, including data, privacy, e-transactions, and tax policies (as described in the overview to this chapter) before opening up to international agreements.<sup>1411</sup> Concerns expressed include losing regulatory control over taxes, threats to online data security, and challenges to traditional employment.<sup>1412</sup> At the African regional level, governments see the need for aligning cross-border policies and integrating e-commerce and digital regulations.<sup>1413</sup> E-commerce is being discussed in the context of the African Continental Free Trade Area (AfCFTA), but is not yet part of formal negotiations.<sup>1414</sup>

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<sup>1405</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>1406</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>1407</sup> International Trade Center and WEF, *Africa E-Commerce Agenda*, September 2019, 5.

<sup>1408</sup> Ibam, “E-commerce in Africa,” January 2018, 3. In addition, African regulators within countries do not always communicate with each other. For example, one source notes that in Nigeria the consumer protection council will come up with rules independently of other government agencies. Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019.

<sup>1409</sup> Industry representative, interview by USITC staff, Lagos, Nigeria, September 2, 2019; International Trade Center and WEF, *Africa E-Commerce Agenda*, September 2019, 5.

<sup>1410</sup> Government representatives, interview by USITC staff, September 10, 2019.

<sup>1411</sup> Government representatives, interview by USITC staff, September 10, 2019.

<sup>1412</sup> Government representatives, interview by USITC staff, September 10, 2019; BCG, “How Online Marketplaces Can Power Employment in Africa,” March 26, 2019.

<sup>1413</sup> ICTSD, “How Should Africa Engage in E-commerce?” March 14, 2018, 6.

<sup>1414</sup> E-commerce is expected to be included in Phase II of AfCFTA negotiations. For more information on the AfCFTA, see chapter 8. Government representatives, interview by USITC staff, September 10, 2019.

## Case Study 7.4: Video Streaming Services in SSA

### Key Findings

This case study focuses on the video on demand (VOD) streaming markets in Nigeria and South Africa, the largest film and video-streaming markets in SSA. It describes the SSA operations of YouTube and Netflix, which are the leading streaming services providers in SSA, and highlights competitive indigenous African streaming services. VOD services are expanding in SSA as internet connectivity increases (with new and improved mobile infrastructure), mobile data prices fall, inexpensive smartphones become more available, and incomes rise. Streaming is changing the video and film market throughout SSA, displacing DVDs and video compact discs (VCDs) as a key distribution and consumption channel for movies and video content. Investment in SSA productions by international streaming providers such as Netflix is boosting the SSA film industry, leading to higher-quality film and TV productions and expanding the international exposure of SSA filmmakers, directors, and producers.

### Overview of the SSA Video Streaming Market

SSA is a small but growing global market for video streaming services. The increasing rollout of 4G networks in SSA has corresponded with strong growth in streaming services subscriptions and revenues during 2017–19.<sup>1415</sup> Google’s ad-based YouTube is the leading over-the-top (OTT)<sup>1416</sup> platform for viewing video content in SSA, but subscription video-on-demand (SVOD) services such as Netflix and many Africa-based providers including iROKOTv (Nigeria) and Showmax (South Africa) are also posting strong growth. SVODs are challenging established SSA satellite and digital terrestrial television (DTT) pay TV as well.<sup>1417</sup> According to one industry estimate, SSA annual OTT video subscription revenues totaled \$223 million in 2018, with growth being driven by 3 million SSA SVOD subscribers. However, the market is still small compared to other global regions; by contrast, the U.S. OTT video market had revenues of \$27 billion in 2018.<sup>1418</sup>

Film production and distribution is a major industry in Nigeria and, to a lesser extent, in South Africa. The Nigerian film industry, known as Nollywood, has become Africa’s “de facto film industry” with a large following across SSA and among the large African community living abroad.<sup>1419</sup> Nigeria’s output of 2,000 films annually makes it the world’s second leading movie producer by volume after India’s

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<sup>1415</sup> Muvi Blogs, “A Look in Africa’s OTT Market,” March 22, 2017. See appendix H for more information on 4G and in SSA.

<sup>1416</sup> This refers to streaming services which are viewed over the internet.

<sup>1417</sup> For a discussion of pay TV and the competition posed by OTT SVOD services, see Babatope, “Democratization of Content and Its Effect on Pay TV,” November 2018.

<sup>1418</sup> Hawkes, “Sub Saharan Africa’s OTT Market Shines,” January 14, 2019; Broadband TV News, “Global OTT Revenues to More Than Double,” June 10, 2019.

<sup>1419</sup> Omanufeme, “Runaway Success,” June 2016.

Bollywood.<sup>1420</sup> One source estimates Nigerian industry revenues to be at least \$590 million.<sup>1421</sup> However, movie ticket sales in Nigeria are only a small fraction of total industry revenues; there are fewer than 150 cinema screens nationwide, and theatrical revenues totaled just \$13.9 million in 2018.<sup>1422</sup> Most Nigerian films are not theatrically released, but sold in DVD and VCD formats or, to a growing extent, streamed over the internet. Such films are typically small-scale inexpensive productions with budgets averaging between \$25,000 and \$75,000, owing to a lack of financing which has limited the industry's professional and technical capacity.<sup>1423</sup> The wide distribution of Nollywood films on VCDs and DVDs<sup>1424</sup> has made them very popular and accessible in Nigeria and the rest of SSA, but has also resulted in widespread piracy (see case study 5.2 in chapter 5).

While SSA film production is mostly centered in Nollywood, South Africa also has a small film industry. At the same time, South Africa is the largest theatrical film market in SSA; its 765 cinema screens generated \$99 million in box office revenues in 2018.<sup>1425</sup> The South African film industry released 22 feature films in 2018, but all of the top-grossing films in the country that year were foreign-made, primarily U.S.-produced movies.<sup>1426</sup>

Nigeria and South Africa, with their large consumer markets, are SSA's leading streaming markets. Rising incomes, increased internet access, and faster download speeds are enabling many Nigerians and South Africans to purchase SVOD services, which counted 1.3 million subscribers combined in 2017. Major providers included Netflix, iROKOTv, Showmax (owned by SSA satellite company DStv), and Amazon Prime Video.<sup>1427</sup> South Africa and Nigeria together accounted for 71 percent of SVOD subscriptions in SSA in 2018, but other SSA countries are expected to increase their market share substantially by 2024.<sup>1428</sup> Relatively high-income South Africa was SSA's leading market for paid streaming subscriptions in 2018<sup>1429</sup> (in 2018, GDP per capita in South Africa was \$13,687, more than double Nigeria's \$5,991).<sup>1430</sup>

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<sup>1420</sup> Marché du Film, "Marché du Film 2019," 2019, 61.

<sup>1421</sup> Omanufeme, "Runaway Success," June 2016; Marché du Film 2019, "Festival de Cannes," 2019, 61. Some of this revenue projection may include the value of foreign-made films that are viewed in theaters and sold through VCDs/DVDs. However, there are no reliable sources for industry revenues or value.

<sup>1422</sup> Gross box-office revenues. Marché du Film, "Marché du Film 2019," 2019, 61.

<sup>1423</sup> Oh, "Nigeria's Film Industry," October 2014; Marché du Film, "Marché du Film 2019," 2019, 61.

<sup>1424</sup> Nigerian film distribution has traditionally been controlled by cartels of film marketers that operate networks of shops and other outlets and that have significant influence on which films are made and distributed. Oh, "Nigeria's Film Industry," October 2014.

<sup>1425</sup> Marché du Film, "Marché du Film 2019," 2019, 60.

<sup>1426</sup> *Black Panther* was the top-grossing film in South Africa in 2018, generating revenue of \$8.2 million. Marché du Film, "Marché du Film 2019," 2019, 61.

<sup>1427</sup> Clark, "African SVOD Is Growing," July 23, 2018. Estimated using data from data from Digital TV News, "Africa to Reach 10 Million SVOD Subscribers," June 26, 2018. Amazon Prime Video is available through its app but currently has a small market share in SSA. Digital TV News, "Africa to Reach 10 Million SVOD Subscribers," June 26, 2018.

<sup>1428</sup> Data from Digital TV Research as reported by Hawkes, "Sub Saharan Africa's OTT Market Shines," January 14, 2017.

<sup>1429</sup> Hootsuite, "Digital 2019, South Africa," 2019, and "Digital 2019, Nigeria," 2019; Clark, "African SVOD Is Growing," July 23, 2018.

<sup>1430</sup> World Bank, World Development Indicators, "GDP Per Capita, PPP (current international \$)" (accessed February 17, 2020).

## The Role of U.S. Firms Supplying Streaming Services: YouTube and Netflix

U.S. firms YouTube and Netflix are significant suppliers of streaming services in Nigeria and South Africa. YouTube is the predominant video-streaming platform in Nigeria and is the most popular streaming platform for Nigerian video bloggers, musicians, filmmakers, and videographers. In Nigeria, an estimated 45 million active monthly users visited YouTube in 2019, up 34 percent from 33.5 million in 2015, and revenues more than doubled during 2015–19 to \$101 million (figure 7.7). In 2018, YouTube was the third most visited website in Nigeria<sup>1431</sup> and among the most visited social media sites, with 53 percent of internet users accessing the platform.<sup>1432</sup> Movies were the leading internet search query in 2018,<sup>1433</sup> and YouTube channels featuring Nollywood films accounted for 3 of the top 10 most subscribed channels in Nigeria in 2019.<sup>1434</sup> The leading Nollywood film SVOD streaming service, iROKOtv, offers a certain amount of free Nollywood programming on its YouTube channel. However, one source notes that YouTube views of Nigerian content are led by the Nigerians living abroad and non-Nigerians residing outside the country, whose content views are larger in number than views by domestic users.<sup>1435</sup> YouTube’s revenues in Nigeria were lower than in South Africa, even though there were twice as many Nigerian users, primarily because Nigerian content creators generate lower ad revenues and are generally paid less per view than in more developed markets.<sup>1436</sup> Consequently, Nigerian YouTube content creators rely on brand integration and sponsorship rather than on view counts to make money.<sup>1437</sup>

Streaming platforms are also gaining importance as social media platforms. In South Africa, YouTube is the second most active social media platform, behind WhatsApp, with 84 percent of online users accessing the site in 2018.<sup>1438</sup> The South African platform experienced slower user growth than in Nigeria but posted stronger revenue gains during 2015–19 (figures 7.7 and 7.8). YouTube’s revenue in South Africa was more than three times that in Nigeria (\$101 million), increasing to \$321 million with 20 million active users in 2020 (figure 7.8). This was due to higher advertising revenue per user in the more economically developed South African market. YouTube is the second leading website by number of visitors and page downloads in South Africa, with music videos, TV shows, and movies the leading search queries in 2018.<sup>1439</sup>

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<sup>1431</sup> Based on number of visitors and total page views. Hootsuite, “Digital 2019, Nigeria,” 2019, 24, 29.

<sup>1432</sup> Statcounter, “Social Media Stats Africa” (accessed October 2, 2019).

<sup>1433</sup> Based on number of visitors and total page views. Hootsuite, “Digital 2019, Nigeria,” 2019, 41.

<sup>1434</sup> Vidooly, “Most Subscribed YouTube Channels in Nigeria” (accessed October 7, 2019).

<sup>1435</sup> Ekwealor, “Online Video Content Is Not King in Nigeria,” March 7, 2019.

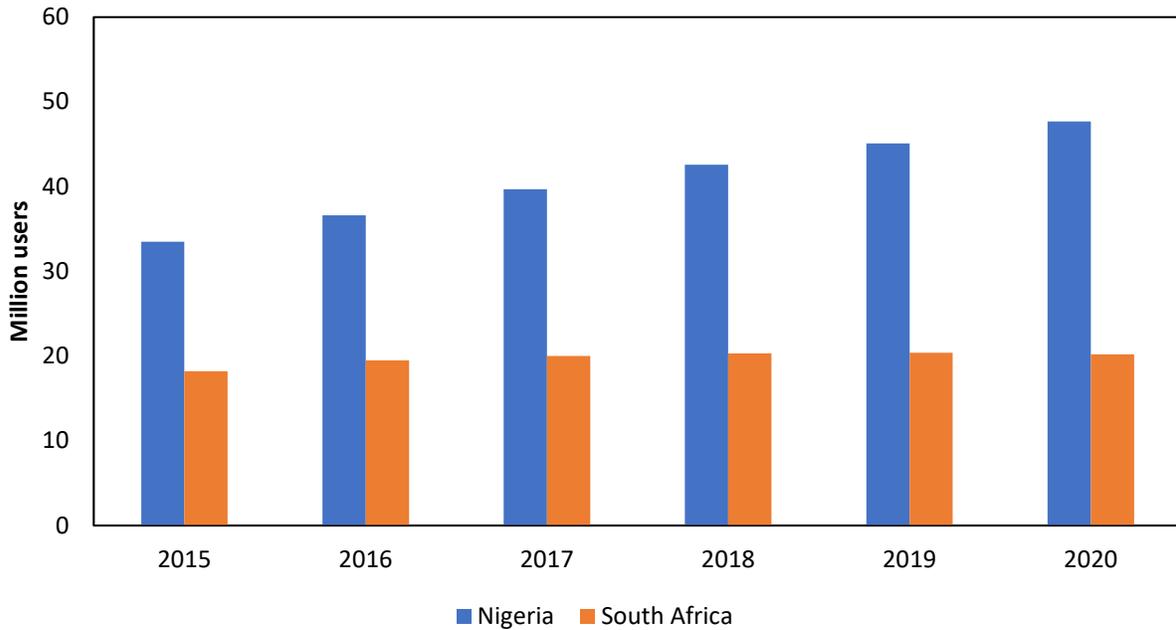
<sup>1436</sup> Oludimu, “Professional Nigerian YouTubers,” March 27, 2019.

<sup>1437</sup> Oludimu, “Professional Nigerian YouTubers,” March 27, 2019.

<sup>1438</sup> Hootsuite, “Digital 2019, South Africa,” February 13, 2019, 33.

<sup>1439</sup> Hootsuite, “Digital 2019, South Africa,” February 13, 2019, 25, 26.

**Figure 7.7** YouTube monthly active users in Nigeria and South Africa, 2015–20 (million users)<sup>a</sup>

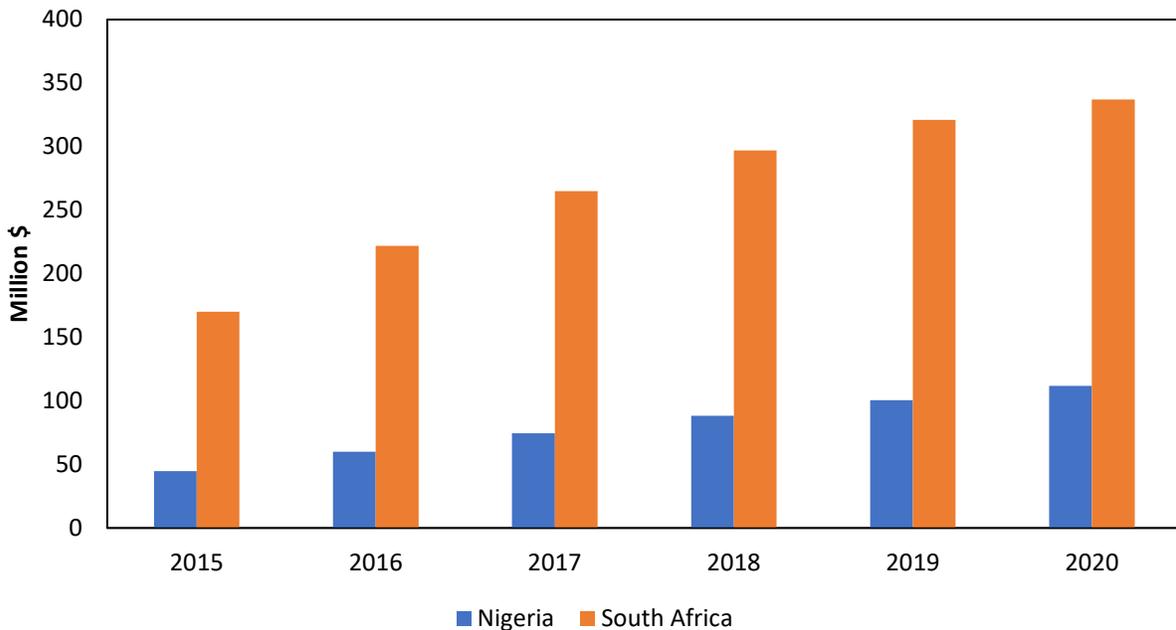


Source: Fusion Nakano Database, “YouTube Monthly Active Users by Year” (accessed October 25, 2019).

Note: See appendix table I.13 for a tabular presentation of the data in this figure.

<sup>a</sup> The values for 2019 are estimates and the values for 2020 values are forecasts.

**Figure 7.8** YouTube revenues in Nigeria and South Africa, 2015–20<sup>a</sup>



Source: Fusion Nakano Database, “YouTube Revenue by Year” (accessed October 25, 2019).

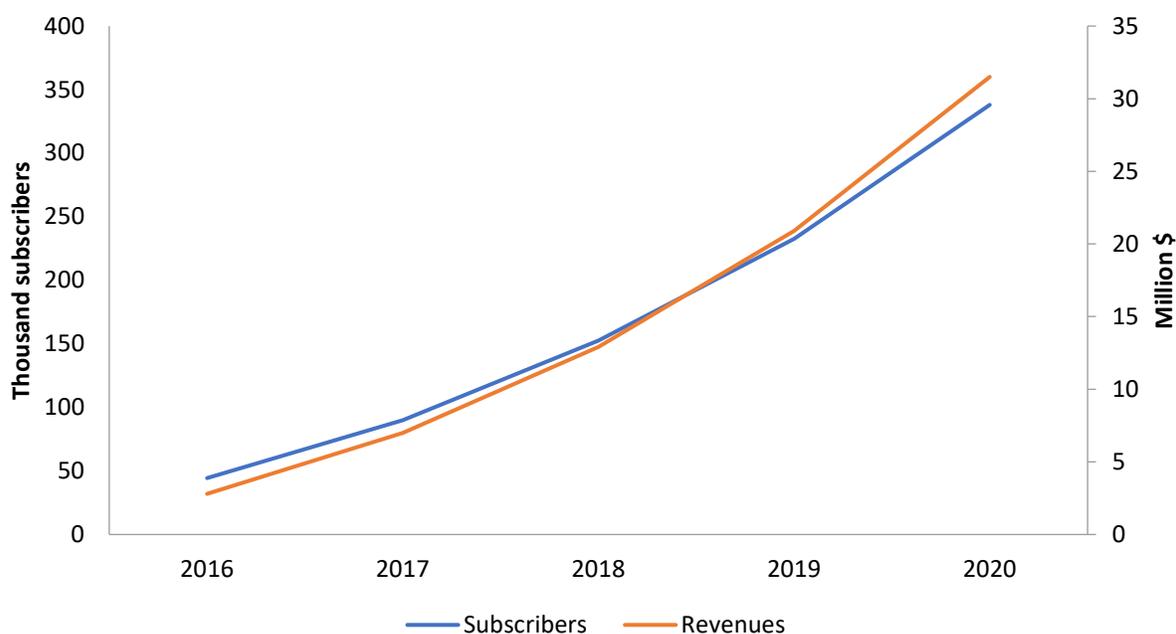
See appendix table I.14 for a tabular presentation of the data in this figure.

<sup>a</sup> The values for 2019 are estimates and the values for 2020 values are forecasts.

Netflix entered SSA in January 2016, when it expanded globally into 130 new markets, and is now available in all SSA countries.<sup>1440</sup> Soon after launching in SSA, Netflix set up local servers in Lagos, Nigeria. These servers use advanced video compression technology and hold Netflix’s entire movie and TV catalogue; they also increase download speeds and reduce buffering time (the preloading of data just before use). The improvements in the latter two functions addressed the leading complaint about video streaming in SSA—its slow download speed—which generally stems from the fact that most VOD content resides in servers located outside the continent.<sup>1441</sup>

South Africa, with its large population and relatively high per capita income, is Netflix’s largest SSA market by number of subscribers and revenues. Since its introduction in South Africa in 2016, Netflix subscriptions and revenues have increased rapidly, rising to an estimated 338,000 subscribers and \$31.5 million in revenues in 2020 (figure 7.9). Netflix user data for Nigeria are not available, but one source estimates that the country had less than 50,000 paid Netflix subscribers in 2019.<sup>1442</sup> Netflix is building its library of African content to serve its global audience and the large African community living abroad, as well as to attract SSA customers who want African content.<sup>1443</sup>

**Figure 7.9** Netflix: Number of subscribers and revenue, South Africa, 2016–20<sup>a</sup>



Source: Fusion Nakano Database, “Netflix Subscribers by Year” and “Revenue by Year” (accessed October 25, 2019).

Note: See appendix table I.15 for a tabular presentation of the data in this figure.

<sup>a</sup> The values for 2019 are estimates and the values for 2020 values are forecasts.

<sup>1440</sup> Epstein, “Pretty Much Everyone on Earth Can Now Get Netflix,” January 6, 2016.

<sup>1441</sup> Kazeem, “Netflix Is Finally Rolling Out More Servers,” October 16, 2016.

<sup>1442</sup> Oludimu, “There Are Probably Less than 50,000 Netflix Subscribers in Nigeria,” September 24, 2019.

<sup>1443</sup> Oludimu, “There Are Probably Less than 50,000 Netflix Subscribers in Nigeria,” September 24, 2019.

Netflix faces strong competition from local OTT SVOD services that offer more local content at lower prices, including iROKOTv and SceneOneTV. The firm also has competition from satellite providers such as Multichoice's DStv, as well as DTT providers.<sup>1444</sup>

iROKOTv, often referred to as the “Netflix” of Africa, is one of the most popular African SVOD services and features a large catalogue of Nollywood programming.<sup>1445</sup> The company started out as a free channel on YouTube and launched its premium SVOD service in 2011, with seed funding from U.S.-based hedge fund Tiger Global Management. The platform further expanded its content with additional investment from France's Canal+.<sup>1446</sup> Its top three markets are Nigeria, the United States, and the UK (owing to the large communities of Nigerian expatriates and immigrants in both countries).<sup>1447</sup> Netflix, considered to be more a complementary service to iROKOTv, offers a different mix of U.S. and global films and TV programming. Moreover, Netflix is far more expensive; in Nigeria and South Africa, the standard rate is \$7.99 per month compared to \$5.53 annually for iROKOTv.<sup>1448</sup> Although there is competition among SVOD providers in Africa, the iROKOTv CEO has stated that he does not see Netflix as a threat because iROKOTv offers different programming.<sup>1449</sup>

## How the Adoption of Video Streaming Affects Other Sectors

Greater investment by international streaming and cable firms in locally produced content is viewed as transformative for the SSA film industry, which has heretofore produced mostly low-budget, high-volume products. Investment by Netflix and other content providers is developing the Nigerian and South African film and video industries and is allowing Nollywood and other SSA film and video creators to access a broader global audience.<sup>1450</sup> In 2018, Netflix reportedly invested \$8 billion worldwide in original productions and has started commissioning original African content.<sup>1451</sup> In 2015, the company purchased the rights to several successful Nigerian films after theatrical release; in 2019, it commissioned its first African Netflix original film, *Lionheart*, by Nollywood star and director Genevieve Nnaji.<sup>1452</sup> In 2019, Netflix purchased the broadcasting rights for *The Boy Who Harnessed the Wind*, by Nigerian-British director Chiwetel Ejiofor; set in Malawi, this highly regarded film debuted at the

<sup>1444</sup> Oludimu, “There Are Probably Less than 50,000 Netflix Subscribers in Nigeria,” September 24, 2019.

<sup>1445</sup> iROKOTv provides Nollywood programming in English and Yoruba. Fick, “iROKOTv Investors Back ‘Netflix of Africa,’” January 25, 2016.

<sup>1446</sup> Canal+ invested \$45 million in iROKOTv's filmmaking unit, ROK, in 2019. Bright, “Canal+ Acquires Nollywood Studio ROK,” July 15, 2019.

<sup>1447</sup> Bright, “Canal+ Acquires Nollywood Studio ROK,” July 15, 2019.

<sup>1448</sup> Oludimu, “There Are Probably Less than 50,000 Netflix Subscribers in Nigeria,” September 24, 2019.

<sup>1449</sup> Shadow and Act, “iRokotv Chief,” April 20, 2017.

<sup>1450</sup> Leach, “Nollywood Is Ready to Go Global,” May 24, 2019.

<sup>1451</sup> Kazeem, “Netflix Is Finally Investing in Original African Content,” December 3, 2018.

<sup>1452</sup> Kazeem, “Netflix Is Finally Investing in Original African Content,” December 3, 2018.

Sundance Film Festival.<sup>1453</sup> Netflix has also signed production agreements with several South African directors for original productions.<sup>1454</sup>

Streaming is also transforming traditional hard-copy video distribution channels in SSA. Increasingly, many Nigerian and South African filmmakers are releasing films direct to streaming platforms as well, including YouTube and a variety of Africa-based VOD platforms.<sup>1455</sup> SSA-produced video content is also being uploaded and streamed on other U.S.-based social media platforms, including Instagram, Facebook, Twitter, and WhatsApp.<sup>1456</sup> Streaming is also providing a platform to budding film and music videographers by allowing them to release works more widely and at much lower expense than through traditional hard-copy channels.

Demand for cloud computing services is also driven by rising levels of streaming in SSA.<sup>1457</sup> Streaming is one of the most data-intensive activities on the internet, accounting for 61 percent of global bandwidth in 2019.<sup>1458</sup> Cloud services are integral to supplying streaming services because they allow for the efficient storage and delivery of large quantities of digital content.<sup>1459</sup> Cloud services also allow streaming providers to manage spikes in viewing demand, enable them to scale up their user base, and cost-effectively expand the variety and volume of streaming content.<sup>1460</sup>

## Policies and Market Conditions Affecting Digital Video Streaming

As an internet-based service, streaming services are affected by policy uncertainty. Firms involved in the digital economy are concerned by the presence of either draft laws or a lack of regulation regarding data localization, privacy, and other important topics (see table 7.2). The industry also faces issues with intellectual property rights policies and enforcement (see case study 5.2 in chapter 5). However, given that the streaming services sector is governed by few specific regulations compared to other digital sectors, market conditions are the leading factors shaping the industry.

### Market Conditions

Slow buffering speeds and high data costs have been a major barrier for streaming services in SSA. Since most users access the internet through non-broadband mobile connections, streaming has been difficult. Mobile data usage is also expensive, and most usage is prepaid. For example, in Nigeria, 96

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<sup>1453</sup> Brown, “Whose Stories Get Streamed?” March 5, 2019; Jedlowski, “What Netflix’s Involvement in Nigeria’s Massive Film Industry Really Means,” January 3, 2019.

<sup>1454</sup> Edwards, “Netflix South Africa versus the World,” February 27, 2019.

<sup>1455</sup> Oludimu, “When Was the Last Time You Used Your DVD Player?” June 25, 2019; Flame Design, “SA Film Students Crack the Online Streaming Industry,” July 16, 2019. Showmax also offers free streaming for certain programming.

<sup>1456</sup> Oludimu, “When Was the Last Time You Used Your DVD Player?” June 25, 2019.

<sup>1457</sup> For more on the role cloud computing plays in delivering digital services in SSA, see case study 7.1 in this chapter.

<sup>1458</sup> Sandvine, “The Global Internet,” September 2019, 6, 16, 18.

<sup>1459</sup> Perry, “Cloud Computing in the Media and Entertainment Industry,” July 4, 2018.

<sup>1460</sup> Sandvine, “The Global Internet,” September 2019, 6, 16, 18.

percent of mobile data usage must be prepaid.<sup>1461</sup> This has led Google to develop a leaner version of its YouTube app, called YouTube Go, that allows users to download content in a range of resolutions that can be watched offline.<sup>1462</sup> The service was launched in Nigeria in 2017, followed by South Africa in 2018.<sup>1463</sup> The app is designed for low-end phones and provides less functionality, but it allows users to preview video information so that mobile data are not used for pulling the wrong video. Moreover, YouTube Go allows users to watch downloaded videos repeatedly provided they log onto the site monthly.<sup>1464</sup>

Another key challenge affecting Netflix and other SVOD providers in SSA is the illicit sharing of accounts. Observers report that in Nigeria, for instance, most Netflix viewers reportedly share account information and passwords, so the number of viewers is likely much higher than the number of paid subscriptions.<sup>1465</sup> This is a costly worldwide problem: Netflix estimates global revenue losses from account sharing to be as high as \$2.3 billion annually.<sup>1466</sup>

## Case Study 7.5: Internet of Things Devices in SSA

### Key Findings

The Internet of Things (IoT) refers to digital technologies that include interconnected physical devices and sensors.<sup>1467</sup> In SSA the adoption of IoT technologies has lagged far behind that of developed countries,<sup>1468</sup> hindered by comparatively low rates of industrialization and a lack of high-quality infrastructure. Despite these obstacles, certain countries, including Ethiopia, Ghana, and Rwanda, among others, have had some success in applying IoT technologies to addressing infrastructure challenges. This case study highlights recent efforts by SSA countries to adopt two IoT technologies—drone delivery and smart city systems—to help address healthcare and public works issues.

<sup>1461</sup> Matuluko, “YouTube Go,” September 18, 2017.

<sup>1462</sup> Busari, “Nigerians Can Now View YouTube Offline,” July 28, 2017.

<sup>1463</sup> Nigeria was the second global market to access YouTube Go, after the initial launch in India. Busari, “Nigerians Can Now View YouTube Offline,” July 28, 2017.

<sup>1464</sup> Matuluko, “YouTube Go,” September 18, 2017.

<sup>1465</sup> Oludimu, “There are Probably Less than 50,000 Netflix Subscribers in Nigeria,” September 24, 2019.

<sup>1466</sup> Oludimu, “There are Probably Less than 50,000 Netflix Subscribers in Nigeria,” September 24, 2019.

<sup>1467</sup> IoT can involve a variety of devices, such as sensors in factories, wearable fitness devices, self-driving cars, the transmission of diagnostic data from cars and planes, and flying drones. IBM, “What Is the Internet of Things?” November 17, 2016.

<sup>1468</sup> For example, total spending on IoT in the entire Middle East and Africa region was estimated to be \$8.5 billion in 2019 (\$1.9 billion of which occurred in South Africa), compared to \$194 billion in the United States alone. IDC, “IoT Spending in the Middle East and Africa,” July 25, 2019; Tomás, “US to Lead Global IoT Spending,” January 4, 2019.

## Drone Delivery of Medical Supplies

### Overview of the SSA Market for Drone Delivery Services

One frequently cited example of U.S. firms' efforts to address infrastructure challenges in SSA is the use of drones to deliver medical supplies to remote or difficult-to-access locations, such as the program developed by U.S.-based Zipline, headquartered in San Francisco.<sup>1469</sup> In October 2016, Zipline established a network for the drone delivery of blood products in Rwanda. It currently operates two distribution centers in that country.<sup>1470</sup> The firm expanded to Ghana in April 2019 under a four-year contract with that country's government, and planned to have a total of four centers for the distribution of blood, vaccines, and medicine in Ghana by year-end 2019.<sup>1471</sup> As of November 26, 2019, Zipline reported that it had made over 24,000 drone deliveries, flown more than 2 million kilometers, and provided services to a population of about 16 million.<sup>1472</sup>

Zipline's program relies on hardware, software, and delivery systems engineered and built for its specific purposes.<sup>1473</sup> The firm uses fixed-wing drones that are launched from a track, fly autonomously on routes that are programmed using GPS navigation, and drop supplies at a designated five-meter target site.<sup>1474</sup> The firm's launch system enables drones to reach cruising speed quickly, and dropping packages from the air saves battery power that would otherwise be used to hover or land at the delivery site.<sup>1475</sup> Zipline currently conducts research and development and assembles its drones in California.<sup>1476</sup> The firm also employs local workers to run its operations in Africa.<sup>1477</sup>

Other U.S. entities have tested ways of using drones to transport medical samples and supplies in SSA. In 2016, U.S. firm Matternet collaborated with the United Nations Children's Fund (UNICEF) in Malawi to test the feasibility of using drones to transport blood samples to a laboratory for HIV testing.<sup>1478</sup> Also in 2016, U.S. firm Vayu collaborated with Stony Brook University, USAID, and the government of Madagascar to test drone transportation of stool and blood samples in that country.<sup>1479</sup> Additionally, in

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<sup>1469</sup> Zipline, "Our Mission: Provide Every Human on Earth with Instant Access to Vital Medical Supplies," (accessed March 16, 2020); Craft.co, "Zipline" (accessed March 16, 2020).

<sup>1470</sup> Zipline, "Our Impact" (accessed July 25, 2019); de Leon, "Zipline Takes Flight in Ghana," April 24, 2019.

<sup>1471</sup> Zipline, "Our Impact" (accessed July 25, 2019); Asiedu, "An Ambitious Drone Delivery Health Service," April 25, 2019. Other efforts to deliver medical supplies in SSA via drone include a pilot project conducted by German firms DHL and Wingcopter in Tanzania and the United Nations- and Dutch-funded drone pilot project in Ghana. Fleming, "Drones Are Saving Lives," April 2019; Rise Africa Rise, "Drones Will Change Africa" (accessed July 2, 2019).

<sup>1472</sup> Zipline, "Zipline" and "Our Impact" (accessed November 26, 2019).

<sup>1473</sup> Bright, "Drone Delivery Start-Up Zipline," April 24, 2019.

<sup>1474</sup> Rosen, "Zipline's Ambitious Medical Drone Delivery," June 8, 2017; Nuki, "Pointing the Way," February 16, 2018.

<sup>1475</sup> Hsu, "Africa's Delivery Drones," September 13, 2017; Real Engineering, "How Rwanda Built a Drone Delivery Service," video, January 25, 2019.

<sup>1476</sup> Lee, "Zipline Plans to Build Drone Assembly Plant," November 23, 2018; Zipline, "About" (accessed August 5, 2019, and November 26, 2019).

<sup>1477</sup> de Leon, "Zipline Takes Flight in Ghana," April 24, 2019.

<sup>1478</sup> Reuters, "Drones Could Speed Up HIV Tests," April 20, 2016; Prokopivič, "Why Drone Use Is Different in Africa," May 18, 2018.

<sup>1479</sup> UAS Vision, "Vayu's Drones Deliver Healthcare," August 11, 2016.

August 2019, U.S. nonprofit VillageReach—together with Australian firm Swoop Aero, Geneva-based public-private partnership Gavi, and the Democratic Republic of the Congo (DRC) Ministry of Health—collaborated in a demonstration project in which vaccines were delivered via drone to a remote village in the DRC.<sup>1480</sup>

## How the Adoption of Drone Delivery Services Affects Other Industries

Proponents say that there are health-related advantages to drone delivery, which may also benefit the health care industry and the economy as a whole. They report that the use of drones saves lives by providing access to vaccines, blood, and other crucial medical supplies, and by cutting the time needed to deliver these products to remote locations.<sup>1481</sup> Increased access to preventative treatments (particularly vaccines) through drone delivery may have a positive impact on household and national economies.<sup>1482</sup> Additionally, drone use may reduce waste by increasing supply chain efficiency and, thus, minimizing the volume of supplies that need to be stored at local medical facilities.<sup>1483</sup> Specifically, Zipline reports that its average delivery time is 30 minutes (as compared to a round-trip road journey of five hours in some locations) and indicates that the use of drones has reduced the volume of expired blood supplies in Rwanda to zero.<sup>1484</sup>

## Policies and Market Conditions That Affect Drone Delivery Services

The success of drone delivery programs in SSA has been affected by market conditions, public concerns, the relative cost of competing delivery methods, and a developing and uncertain regulatory environment. Some believe that the use of drones may raise anxieties among bystanders, as drones have been used in military operations in parts of the region. Moreover, drones are not always the lowest-cost delivery option, and authorities do not always believe that the cost of drone programs is justified. Matternet's test program in Malawi revealed that samples could be transported more cheaply via motorcycle due to their larger cargo capacity.<sup>1485</sup> Zipline indicates that while drones are a cost-effective option in emergencies and the overall cost of drone deliveries may drop as the number of deliveries increases, standard road transportation is currently a cheaper option for routine restocking.<sup>1486</sup> Further, the Ghana Medical Association and other opponents of Ghana's drone delivery

<sup>1480</sup> Defawe, "It Takes a Village to Deliver," August 27, 2019; sUAS News, "Drone Fleet Transports Vaccines," August 9, 2019.

<sup>1481</sup> Dutta, Lanvin, and Wunsch-Vincent, *Global Innovation Index 2019*, 2019, 177; Rise Africa Rise, "Drones Will Change Africa" (accessed July 2, 2019); Zipline, "Our Impact" (accessed November 26, 2019).

<sup>1482</sup> IHS Markit, "Drones and Blockchain," October 31, 2019, 4.

<sup>1483</sup> Rosen, "Zipline's Ambitious Medical Drone Delivery in Africa," June 8, 2017.

<sup>1484</sup> Zipline, "Our Impact" (accessed July 25, 2019); Dutta, Lanvin, and Wunsch-Vincent, *Global Innovation Index 2019*, 2019, 177.

<sup>1485</sup> Associated Press, "The Life-Saving Potential of Drones," October 10, 2016.

<sup>1486</sup> Rosen, "Zipline's Ambitious Medical Drone Delivery," June 8, 2017.

program contend that the full operating cost of the program—which will ultimately reach \$88,000 monthly—would be better applied to more critical health care needs.<sup>1487</sup>

Regulatory issues can also impede the use of drones. For example, countries typically do not guarantee approval for nighttime flights or flights beyond an operator’s line of sight. In addition, some countries have not enacted any regulations on drones.<sup>1488</sup>

These factors have a substantial impact on firms’ operations in this emerging market. Zipline has addressed regulations and public concerns by simplifying its operations, developing safety protocols, and collaborating with governments. For example, Zipline receives orders directly from doctors, which eliminates the need to collect, track, and protect patients’ private health information.<sup>1489</sup> By partnering with Rwanda’s government, Zipline has been able to build trust and contribute to the development of a regulatory framework for drone operations.<sup>1490</sup> Zipline has also built several safety protocols into its equipment and operations, such as routine contact with the Rwandan Civil Aviation Authority before all flights, parachutes for emergency landings, and backup motors and flight computers.<sup>1491</sup>

## Smart Cities

### Overview of the SSA Market for Smart City Technologies

Smart cities are cities that use information and communications technology (ICT) and other innovations to increase the efficiency of urban operations and service delivery, with the ultimate goal of improving citizens’ quality of life.<sup>1492</sup> In these environments, administrators leverage data collected from internet-connected devices to provide public services and infrastructure—including transportation, cybersecurity, waste management, utilities, and internet access—more efficiently.<sup>1493</sup> Industry representatives consider African cities to be ideal candidates for smart city technology due to the rapid rates of population growth and urbanization in the region.<sup>1494</sup> The absence of legacy infrastructure, such as landline telephone cables, allows SSA cities to install the latest ICT and IoT technology without the

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<sup>1487</sup> IHS Markit, “Drones and Blockchain,” October 31, 2019, 4.

<sup>1488</sup> Rwanda modified its regulations to allow Zipline to provide services in that country. Rosen, “Zipline’s Ambitious Medical Drone Delivery,” June 8, 2017; Associated Press, “The Life-Saving Potential of Drones,” October 10, 2016; Amos, “With 7 Out of 10 Residents,” October 31, 2016; USITC analysis based on information compiled from UAV Coach, “Master List of Drone Laws” (accessed May 31, 2019–July 2, 2019).

<sup>1489</sup> Yuan, “A Medical Drone Startup’s Approach,” June 10, 2019.

<sup>1490</sup> Yuan, “A Medical Drone Startup’s Approach,” June 10, 2019; FINN, “Rwanda Pioneers Regulatory Framework” (accessed November 26, 2019).

<sup>1491</sup> Ashimwe, “Inside Zipline’s New Distribution Centre,” March 19, 2019.

<sup>1492</sup> ITU, “Focus Group on Smart Sustainable Cities” (accessed December 2, 2019). An alternative industry definition of smart cities is the use of ICT and other technology to improve quality of life and to develop efficient urban operations, services, and competition that meet current and future generations’ economic, social, and environmental needs. ITU, *Smart Sustainable Cities: An Analysis of Definitions*, October 2014, 2. The International Telecommunication Union (ITU) is a specialized agency for ICT issues in the UN.

<sup>1493</sup> CB Insights, “What Are Smart Cities?” January 9, 2019; Deloitte, *Industry 4.0, Is Africa Ready for Digital Transformation?* April 14, 2019, 8.

<sup>1494</sup> Africa is the second fastest urbanizing region in the world. Siba and Sow, “Smart City Initiatives in Africa,” November 1, 2017; Deloitte, “Africa Is Ready to Leapfrog the Competition,” 2016.

additional costs of removing past systems.<sup>1495</sup> The young and growing SSA population and the spread of mobile phones may also encourage the adoption of smart city technologies in the region.<sup>1496</sup>

Since 2012, cities in Rwanda, Nigeria, Ghana, Ethiopia, and South Africa have launched smart city initiatives. These efforts include housing projects, ICT-linked infrastructure, e-governance platforms (see box 7.3), and transportation projects.<sup>1497</sup> For example, in April 2019, Kenya committed to the Konza Data Center and Smart City project. Part of China’s Belt and Road Initiative, the project will be developed by the Chinese firm Huawei and is expected to create jobs and increase economic output.<sup>1498</sup> In 2017, Addis Ababa used Chinese technology to introduce its first smart parking facility, Smart Megenagna, which can hold 90 cars—10 times its original capacity.<sup>1499</sup> Further, in 2013, Ghana partnered with IBM to launch its National Urban Policy Framework and Action Plan, which encompasses transportation, e-governance, and energy. Notably, transportation is one of key challenges faced by the capital city of Accra due to rapid urbanization.<sup>1500</sup>

Rwanda has made marked efforts in smart city development and is considered a pioneer in smart city technology in SSA.<sup>1501</sup> In 2012, Rwanda’s Ministry of Youth and ICT issued its 2013–2018 *SMART Rwanda Master Plan*, which established a national ICT strategy. As of 2017, Rwanda had 17 smart initiatives, including its e-government portal (Irembo), Kigali Innovation Park, smart grids, e-health services, e-policing, and one-laptop-per-child programs.<sup>1502</sup> The 2015–2020 *SMART Rwanda Master Plan* builds on the earlier plan’s ICT goals for improved ICT quality; expanded ICT applications in government, healthcare, and education; and increased ICT employment and investment opportunities. Rwanda’s ambitions include a cashless, paperless, 24-hour self-service government; electronic due diligence and loan systems for SMEs; broadband and digital literacy programs for all; and other ICT-based improvements that contribute to gains in efficiency, private sector opportunity, GDP, and jobs.<sup>1503</sup> Rwanda is implementing its smart city engineering projects through public-private partnerships with local and international ICT firms from the United States, Sweden, Finland, the UK, China, and South Korea.<sup>1504</sup> Overall, Rwanda’s smart city efforts have made it a particularly attractive SSA market for innovators and entrepreneurs.<sup>1505</sup>

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<sup>1495</sup> Most IoT systems in SSA rely on mobile broadband connections. By one estimate, SSA will have 44 million of these connections using IoT by 2025. USITC, hearing transcript, July 24, 2019, 158 (testimony of Brian Scarpelli, Microsoft Corporation).

<sup>1496</sup> Siba and Sow, “Smart City Initiatives in Africa,” November 1, 2017; Deloitte, “Africa Is Ready to Leapfrog the Competition,” 2016; Veras, “Smart Cities in Africa: Nairobi and Cape Town,” April 10, 2017.

<sup>1497</sup> Kuo, “African Countries Want to Turn,” July 6, 2017.

<sup>1498</sup> Opiah, “Kenya Signs \$665.4m Deal with China,” *Data Economy*, April 29, 2019.

<sup>1499</sup> Shaban, “Ethiopia Bags a Continental First,” June 15, 2017; BBC, “Using Smart Parking to Ease Congestion in Addis Ababa,” November 18, 2019.

<sup>1500</sup> IBM, “IBM Report: Technology Holds the Key,” April 11, 2013.

<sup>1501</sup> Siba, “Smart City Initiatives in Africa,” November 1, 2017; Wang, “No Slums and a ‘Vision City,’” September 2, 2019.

<sup>1502</sup> MITEC, “SMART Rwanda Master Plan,” n.d. (accessed November 15, 2019).

<sup>1503</sup> MITEC, “SMART Rwanda Master Plan,” n.d. (accessed November 15, 2019); MITEC, *ICT Sector Strategic Plan (2018–2024)*, November 2017, 14.

<sup>1504</sup> Njue, “Smart Cities: Rwanda’s Kigali Makes Progress,” April 12, 2018; Siba, “Smart City Initiatives in Africa,” November 1, 2017; Kuo, “African Countries Want,” July 6, 2017.

<sup>1505</sup> Hoy, “Smart Kigali: An IoT Project to Transform Rwanda,” May 26, 2017.

## How the Adoption of Smart Cities Technologies Affects Other Sectors

Smart city technologies have the potential to mitigate the stress that rapid urbanization rates have placed on the underdeveloped transportation and energy infrastructure in SSA. For example, combining ICT with transportation offers mobile-ready payment solutions to bus passengers and ICT functionality at bus stops.<sup>1506</sup> Moreover, the collection and analysis of real-time traffic information across transport modes linked to traffic signals allows safe, dependable, on-demand transport.<sup>1507</sup> Countries can also improve the safety, reliability, and availability of energy by using smart grids, or energy grids equipped with ICT, which can anticipate outages, maintain power, and reroute electricity flow.<sup>1508</sup> Furthermore, smart grids permit the integration of multiple renewable energy sources and disparate storage options, further stabilizing electricity output and reducing costs for governments and private businesses.<sup>1509</sup> Smart city technologies can also be applied to other functions of government in SSA (see box 7.3).

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<sup>1506</sup> Smart Cities World Forums, “Huawei Launch ‘Smart Transportation Solution,’” March 28, 2017; Nkurunziza, “Kigali City Bus Stops to Go Hi-Tech,” January 5, 2019.

<sup>1507</sup> IT News Africa, “Smart Transportation—an African Game Changer,” June 21, 2018.

<sup>1508</sup> Smart Energy International, “Africa Ready to Adopt Smart Grid Technology,” May 14, 2018; Willan, “Smart Grids Way Forward for Sub-Saharan Africa,” July 20, 2018; General Electric Company, “Re-imagining the Future of Power in Sub-Saharan Africa,” May 2019.

<sup>1509</sup> World Bank Group, “The Race for Universal Energy Access Speeds Up,” July 10, 2018; Frost & Sullivan, “Digitization of Energy Transmission and Distribution in Africa,” 2018; ESI Africa, “The Power of Smart Grid Technology,” January 1, 2018.

**Box 7.3: E-governance in Sub-Saharan Africa**

Often included in smart city proposals, e-governance is the use of information and communications technology (ICT) to improve the accountability, transparency, inclusiveness, and effectiveness of government-to-constituent transactions.<sup>a</sup> Currently, e-governance includes digital bilateral communication channels between the government and its citizens, businesses, government employees, and local government entities. Using these networks, governments can provide and receive information and/or payments related to voting, taxes, licenses, audits, procurement, administrative policies, and other services that they administer.<sup>b</sup> Similar to Rwanda’s Irempo e-government platform (described earlier in case study 7.5) is Kenya’s eCitizen portal. eCitizen allows Kenyan citizens and foreign residents to apply online for tax, business, marriage, driving, immigration, land, and civil registration services; pay for public services via mobile money, debit cards, and eCitizen agents; and receive permits electronically, all with a single account.<sup>c</sup>

According to the United Nation’s 2016 e-government survey, e-governance—spanning sectors such as education, health, labor and employment, finance, and social welfare—directly contributes to development.<sup>d</sup> By delivering service more efficiently, e-governance effectively reduces governments’ costs of doing business. It also enables governments to publish open data on their operations to ensure accountability and transparency while encouraging participation and innovation in government services.

To work, e-governance requires ICT infrastructure, web presence, ICT-trained employees, as well as an understanding of change management, systems integration, and implementation strategies. The lack of these factors restricts the adoption of e-governance in some developing markets.<sup>e</sup> Poor ICT connectivity, prohibitive costs, and the shortage of necessary skills limit the reach of e-governance across many SSA populations.<sup>f</sup> Future development of e-governance in SSA will likely remain dependent on investments in telecommunications infrastructure and human capital development.<sup>g</sup>

<sup>a</sup> Bannister and Connolly, “Defining e-Governance,” 2012, 5–7.

<sup>b</sup> Chipeta, “A Review of E-government Development in Africa,” October 17, 2018.

<sup>c</sup> Government of Kenya, “eCitizen: A Portal That Offers Access to Information” (accessed December 19, 2019).

<sup>d</sup> UN DESA, *E-government Survey 2016*, August 2016, 4–5.

<sup>e</sup> Chipeta, “A Review of E-government Development in Africa,” October 17, 2018.<sup>e</sup>

<sup>f</sup> As of 2018, Mauritius, South Africa, Seychelles, and Ghana were the only SSA countries that ranked in the top 50th percentile of the E-Government Development Index (EGDI). Notably, the rankings of Burkina Faso, Cameroon, and Ghana have all increased by over 19 places among world rankings of EGDI during 2016–18. Of least developed countries, half of the top 10 in terms of e-governance were SSA countries—namely, Rwanda (120 of 193 overall), Zambia (133), Uganda (135), Togo (138), and Tanzania (139). Upward movements among these and other SSA countries are largely due to improvements in online service delivery and telecommunication infrastructure. UN, *E-government Survey 2018*, August 2018, 135.

<sup>g</sup> UN, *E-government Survey 2018*, August 2018, 128.

## Policies and Market Conditions That Affect Smart Cities Development

As discussed above, national and local government policies drive smart city initiatives by outlining the scope of the smart city development. For most of SSA, these policies cover a wide variety of sectors with broad targets, narrowing the obstacles in implementation to market conditions, such as constraints in infrastructure, domestic integration, and inclusivity.

## Market Conditions

Cities wishing to supply smart city technologies must rely heavily on widespread smartphone adoption and availability of broadband, wireless networks, and data storage. These needs make reliable infrastructure development a central program within smart city initiatives.<sup>1510</sup> Similarly, integrating smart city technologies with existing domestic infrastructure and services is critical to their successful delivery. International partner firms may fail to achieve this integration if their understanding of the particular SSA market is inadequate.

This disconnect has led to project failures in a few instances. In 2016, a South Korean-built smart bus system in Rwanda—which featured free Wi-Fi and a cashless payment system—had connectivity issues due to its incompatibility with the local Rwandan bus fleet.<sup>1511</sup> In addition, some smart city projects fail because of a lack of understanding of the landscape in which the projects operate. In 2013, South Africa announced that a megacity—advertised as the “New York of Africa”—would be developed by a Chinese firm. However, the firm’s insufficient understanding of the social equity and environmental concerns associated with that particular location reportedly undermined the project’s success.<sup>1512</sup> Similarly, critics claim that Rwanda’s Vision City—which incorporates ICT, solar energy, and free public Wi-Fi—may be cost prohibitive for the developing nation as members of parliament cite missed sales targets and low occupancy rates.<sup>1513</sup>

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<sup>1510</sup> USITC, *Global Digital Trade 1*, August 2017, 257.

<sup>1511</sup> Kanamugire, “Rwanda Moves to Revive Bus Internet Service,” April 8, 2018.

<sup>1512</sup> Reboredo et al., “Smart Cities in Developing Countries Can Learn,” March 8, 2019; Reboredo et al., “Failed Fantasies in a South African Context,” 2018, 171, 185; van Zyl, “No More Manhattan for Modderfontein,” March 7, 2019.

<sup>1513</sup> Siba and Sow, “Smart City Initiatives in Africa,” November 1, 2017; Nkurunziza, “Pension Fund Put to Task Over ‘Expensive’ Housing Projects,” September 12, 2019.



## Chapter 8

# Recent Developments in AGOA Strategies and SSA Regional Integration

This chapter is divided into two sections. The first section summarizes strategies that SSA countries have developed and implemented to increase their utilization of African Growth and Opportunity Act (AGOA) preferences in sectors with high potential for trade with the United States, with an emphasis on new developments since 2016.<sup>1514</sup> As requested, this report also includes an overview of the AGOA strategies currently used by Regional Economic Communities (RECs) in SSA, followed by a discussion of measurements of AGOA utilization for each country in the region.

The second section of the chapter addresses regional integration efforts, which also have the potential to reduce trade barriers<sup>1515</sup> that may inhibit trade generally and AGOA utilization in particular. Much of the regional integration that SSA has achieved is through the development of RECs, and eight such RECs are recognized by the African Union (AU). Beyond these regional integration efforts, since 2016, there has also been measured progress in setting up the African Continental Free Trade Area (AfCFTA). The AfCFTA officially went into force on May 30, 2019, for the 28 countries that had submitted their instruments of ratification, while 26 other countries have signed but not ratified the agreement.<sup>1516</sup> Substantive commitments are still under negotiation.

## National AGOA Utilization Strategies

AGOA was created to increase trade and investment between the United States and SSA. The program is built on trade preferences that, along with the Generalized System of Preferences (GSP), allow SSA

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<sup>1514</sup> For background on AGOA utilization strategies, see USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, April 2018.

<sup>1515</sup> Besides inhibiting trade overall, these barriers also push some cross-border trade into the informal sector. According to one report, informal cross-border trade accounts for 30–40 percent of overall intraregional trade. One industry expert estimated it could be as high as 80 percent in some parts of the Economic Community of West African States (ECOWAS). UNECA, ARIA IX, September 2019, 84; industry expert, telephone interview by USITC staff, September 25, 2019.

<sup>1516</sup> The 28 countries that have ratified the agreement are Burkina Faso, Chad, the Republic of the Congo, Côte d'Ivoire, Djibouti, Egypt, Equatorial Guinea, Eswatini (formerly Swaziland), Ethiopia, Gabon, The Gambia, Ghana, Guinea, Kenya, Mali, Mauritania, Mauritius, Namibia, Niger, Rwanda, Saharawi Republic (or Western Sahara), São Tomé and Príncipe, Senegal, Sierra Leone, South Africa, Togo, Uganda, and Zimbabwe. Eritrea is the only African Union member country that has not signed the agreement. Tralac, "African Continental Free Trade Area (AfCFTA) Legal Texts and Policy Documents" (accessed August 8, 2019); African Union, "List of Countries Which Have Signed," October 8, 2019. The Saharawi Republic (or Sahrawi Arab Democratic Republic) is officially referred to by the U.S. government as Western Sahara, the political status of which is considered undetermined by the United States. CIA, "Western Sahara" (accessed January 27, 2019).

countries to ship many goods duty-free to the United States.<sup>1517</sup> The Trade Preferences Extension Act of 2015 renewed AGOA, including the apparel preferences and the third-country fabric provision with more flexible rules of origin requirements for least-developed beneficiary countries. The 2015 extension to the AGOA program encouraged (but did not require) SSA countries to develop AGOA utilization strategies to better benefit from the trade preferences offered by the AGOA program.<sup>1518</sup> To date, 16 of the 39 AGOA-eligible countries have developed publicly available national AGOA strategies, many in conjunction with the U.S. Agency for International Development (USAID). Two RECs—the Economic Community of Western African States (ECOWAS) and the Common Market for Eastern and Southern Africa (COMESA)—have also created AGOA utilization strategies.<sup>1519</sup>

To encourage greater utilization of AGOA preferences, the AU and the United Nations Economic Conference for Africa (UNECA) released *Guidelines on Developing a National AGOA Strategy* in 2012.

The steps for creating a strategy<sup>1520</sup> are as follows:

1. implementing AGOA institutional infrastructure,
2. identifying priority sectors,
3. developing support programs for those sectors, and
4. encouraging investment from the United States, especially from U.S. small and medium-sized enterprises and into the SSA agricultural and food-processing sectors.

In 2014, the AU and UNECA put out a white paper indicating that SSA countries underutilized AGOA and suggested further refinements to AGOA utilization strategies, including addressing problems like insufficient infrastructure and institutions, lack of experience dealing with U.S. markets, and economic setbacks.<sup>1521</sup> The paper also mentions risks, from both political risks in the region and uncertainty about the continuation of the AGOA program, which likely have decreased the incentive for U.S. firms to trade with and invest in the SSA region.

First implemented in 2000,<sup>1522</sup> the AGOA program includes a provision that U.S. and sub-Saharan African government officials should convene “annual high-level meetings,” with the most recent meeting being the AGOA Forum held in Abidjan, Côte d'Ivoire, in 2019. That meeting reiterated the importance of creating AGOA strategies, calling upon RECs and member countries that have developed national AGOA strategies to provide support for AGOA-eligible countries that have yet to develop strategies.<sup>1523</sup> Also at that meeting, the United States and the AU signed a joint statement conveying their intent to continue supporting the AfCFTA.

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<sup>1517</sup> USTR, “African Growth and Opportunity Act (AGOA)” (accessed December 20, 2019).

<sup>1518</sup> Trade Preferences Extension Act of 2015, Pub. L. 114-27, June 29, 2015, 129 Stat. 364 and 368.

<sup>1519</sup> Industry representative, email message to USITC staff, August 20, 2019.

<sup>1520</sup> AUC, UNECA, and ATPC, *Guidelines on Developing a National AGOA Strategy*, June 15, 2012, 10.

<sup>1521</sup> UNECA, *How ‘AGOA 2.0’ Could be Different*, April 2014, 2.

<sup>1522</sup> Trade and Development Act of 2000, Publ. L. 106-200, May 18, 2000, Sec. 105.

<sup>1523</sup> African Trade Ministers, *Recommendations from 2019 AGOA ministerial consultative meeting*, August 5, 2019.

## Summaries of National AGOA Strategies

There have been some recent developments of national AGOA strategies since 2017.<sup>1524</sup> Most recently, Sierra Leone released a national AGOA utilization strategy in early 2019. Mozambique officially released its strategy in 2018, but had previously released a draft of that strategy in 2017.<sup>1525</sup> Malawi released an AGOA-specific strategy in 2018, but had previously mentioned AGOA in its national export strategy.<sup>1526</sup> Kenya and Zambia both released updated strategies in 2018, replacing previous versions from 2012 and 2016, respectively.

Across the 16 national AGOA strategies that are publicly available,<sup>1527</sup> there are two general types of industries prioritized for improving utilization. The first type covers sectors that already have significant exports to the United States under AGOA; improving these sectors generally involves increasing efficiency for trade that is already occurring. The second type involves industries for which certain current destination markets are large—either the SSA domestic market or non-U.S. export markets—but exports to the United States are small. Besides production efficiency improvements, creating a major export market in the United States for these industries also requires improving infrastructure and transportation and creating new ties with U.S. businesses.<sup>1528</sup>

Another commonality between many of the strategies is a call for establishing or increasing production of higher-value-added goods, in particular in the agroprocessing<sup>1529</sup> and light manufacturing industries—areas specifically mentioned in the AU-UNECA *Guidelines*.<sup>1530</sup> However, many raw materials or lightly processed agricultural goods are still integral to most strategies. Table 8.1 shows the SSA countries with national AGOA strategies and the main targeted sectors within those strategies.

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<sup>1524</sup> For a summary of national AGOA strategies developed before 2017, see USITC, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Developments*, April 2018.

<sup>1525</sup> The Mozambique draft was used in the previous report; see USITC, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Developments*, April 2018. Ethiopia also had a draft version of its strategy at the time of that report and is currently working on producing an official strategy. USAID, East Africa Trade and Investment Hub, *New Ethiopia AGOA Strategy in Full Swing*, January 2019.

<sup>1526</sup> Government of Malawi, *Strategic Plan 2011–2016*, September 2011, 10.

<sup>1527</sup> AGOA.info, “National AGOA Strategies” (accessed October 21, 2019). Burundi has a national AGOA strategy but has been suspended from receiving AGOA benefits since January 1, 2016. Executive Office of the President, Proclamation no. 9383, 80 Fed. Reg. no. 80615 (December 24, 2015).

<sup>1528</sup> Based on USITC staff summaries of AGOA national strategy documents, collected November 29, 2019.

<sup>1529</sup> Case study 4.3 in chapter 4 of this report focuses on agroprocessing value chains in the region.

<sup>1530</sup> AUC, UNECA, and ATPC, *Guidelines on Developing a National AGOA Strategy*, June 15, 2012, 10.

**Table 8.1** AGOA beneficiary countries that have completed national AGOA strategies in high-priority industries and products

AGOA beneficiary country	Strategy Year	Agricultural and food processing	Textiles, apparel, footwear, and leather products	Jewelry and mining	Handicrafts	Other light manufacturing
Botswana	2017	•	•	•	•	
Ethiopia	2015	•	•			
Ghana	2016	•	•	•	•	
Kenya	2018 <sup>a</sup>	•	•		•	
Lesotho	2016	•	•	•	•	
Madagascar	2015	•	•	•	•	
Malawi	2018	•	•	•		•
Mali	2016	•	•	•	•	
Mauritius	2013	•	•	•		•
Mozambique	2018	•	•	•		•
Rwanda	2016	•	•		•	
Senegal	2015	•	•		•	•
Sierra Leone	2019	•	•			
Tanzania	2016	•	•		•	
Togo	2017	•	•	•	•	
Zambia	2018 <sup>a</sup>	•	•		•	

Source: Compiled from national AGOA strategy documents, including strategy document drafts.

<sup>a</sup> Strategies have been updated from a previous version.

As noted, some countries have updated their AGOA strategies, reflecting improved experience in designing and implementing a strategy.<sup>1531</sup> For example, Kenya first developed an AGOA utilization strategy in 2012, before the most recent extension of AGOA in 2015, and then released a new AGOA strategy in 2018.<sup>1532</sup> The industries prioritized were similar in both versions of the strategies, with some new agricultural subsectors like fresh fruits and vegetables and processed foods added in the 2018 strategy. However, the biggest changes were in providing more resources and structure to Kenya's national committee tasked with implementing the strategy, since the previous version was found to be less effective than intended.<sup>1533</sup>

SSA countries' national AGOA strategies also emphasize the importance of attracting foreign direct investment (FDI) from the United States and other countries.<sup>1534</sup> A barrier to further investment mentioned in several national AGOA strategies is SSA's dependence on AGOA preferences to make its

<sup>1531</sup> Kenya and Zambia both updated strategies in 2018, but Kenya's previous strategy was from 2012, while Zambia's was from 2016. Malawi created a national AGOA strategy in 2018 but previously had a general national export strategy that designated some priority sectors for exports under AGOA. Tralac, "National AGOA Strategies" (accessed December 20, 2019); USITC, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Developments*, 2017.

<sup>1532</sup> USAID and Chemonics International, *Kenya—National AGOA Strategy 2012*, June 28, 2012. Government of Kenya, MITC, *Kenya—National AGOA Strategy 2018–2023*, July 30, 2018.

<sup>1533</sup> Government of Kenya, MITC, *Kenya—National AGOA Strategy 2018–2023*, July 30, 2018, 5.

<sup>1534</sup> For example, Ghana's AGOA strategy references its National Export Strategy goal of increasing its number of FDI-infused firms from 10 to 50 by 2025, with at least 10 of those new firms geared towards U.S. markets. Kenya's strategy involves improving its business environment to attract investment, including improving financing, infrastructure, and export institutions. Dexis Consulting Group, *National AGOA Strategy: Ghana*, November 4, 2016, 47; Government of Kenya, MITC, *Kenya—National AGOA Strategy 2018–2023*, July 30, 2018, 3.

apparel industry competitive.<sup>1535</sup> These countries' current competitive advantage in apparel comes solely through the cutting of tariffs on apparel to zero, since the apparel sectors of Bangladesh, Vietnam, and China are more cost-competitive than those of SSA countries.<sup>1536</sup> The current competitive advantage that SSA countries have in the apparel sector will decline significantly if AGOA expires in 2025. The uncertainty about AGOA renewal will likely discourage U.S. FDI in the SSA apparel sector.

In 2015, before the latest renewal of the AGOA program, a report by the Congressional Research Service found that overall, in the years leading up to expiration, SSA countries underutilized AGOA benefits. Furthermore, the report stated that some of the benefits that had seen greater use in some SSA countries, like the apparel benefits, had only spurred job creation for low-skilled labor that will not translate to long-term competitive advantages such as knowledge transfer to local workers.<sup>1537</sup> The report also noted that some AGOA-eligible agricultural products are subject to U.S. tariff-rate quotas (TRQs) limiting the amount of the goods that can be imported under AGOA preferences. For example, in Malawi's national AGOA strategy document, sugar TRQs are specifically mentioned as prohibiting growth in that export sector.<sup>1538</sup>

The U.S. Trade Representative (USTR) has stated his intent to pursue a model bilateral trade deal with an SSA country as a replacement for AGOA after the program expires in 2025.<sup>1539</sup> The prospects for concluding bilateral trade agreements with African nations, among other post-AGOA options, had already been discussed in a report called *Beyond AGOA*, published by the Office of the U.S. Trade Representative in 2016 under a previous USTR. That report noted that many SSA countries are unable to meet comprehensive, high, and symmetric standards, which would make it more difficult to negotiate traditional U.S. trade agreements.<sup>1540</sup> It is unclear how SSA countries will respond to these developments. The AU has called for continental solidarity and has asked countries not to enter into FTAs with third countries until the AfCFTA is implemented, but some countries and RECs have already negotiated such agreements, and others seem willing to do so.<sup>1541</sup>

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<sup>1535</sup> Burundi's national AGOA strategy document is a good example of these concerns, as reflected in tables comparing cost breakdowns for apparel production by Burundi, other SSA countries, and China. Other national AGOA strategies contain similar comparisons. USAID and Chemonics International, *Burundi National AGOA Strategy Draft*, February 19, 2014, 11.

<sup>1536</sup> USAID and Chemonics International, *Burundi National AGOA Strategy Draft*, February 19, 2014, 8; Dexis Consulting Group, "Ghana National AGOA Strategy," November 4, 2016, 6.

<sup>1537</sup> Williams, "AGOA: Background and Reauthorization," April 22, 2015, 13.

<sup>1538</sup> Government of Malawi, MITI, *AGOA Response Strategy and Action Plan for Malawi*, October 2018, 31.

<sup>1539</sup> Lighthizer, "Statement at the 2018 AGOA Forum," July 11, 2018.

<sup>1540</sup> According to that report, a traditional U.S. trade agreement (1) is comprehensive in the areas and policies it covers, (2) contains high standards, and (3) is generally symmetric and uniform. USTR, *Beyond AGOA*, September 2016, 74.

<sup>1541</sup> According to the *ARIA IX* report, there are 18 FTAs between SSA and third-party countries, with ongoing discussions or negotiations for other agreements. UNECA, AUC, AfDB, and UNCTAD, *Assessing Regional Integration in Africa: ARIA IX*, September 2019, 56–58.

## Summaries of REC AGOA Strategies

At least two RECs have developed regional AGOA strategies: the Common Market for Eastern and Southern Africa (COMESA)<sup>1542</sup> and the Economic Community of West African States (ECOWAS).<sup>1543</sup>

The COMESA strategy<sup>1544</sup> seeks to leverage the short-term benefits from AGOA preferences into long-term improvement and diversification of the region’s export sector. According to the strategy document, AGOA preferences should be used to build up light manufacturing and agroprocessing sectors with the goal of eventually making these sectors competitive without the preferences.<sup>1545</sup> This means incorporating higher value-added processes in the value chain for products currently exported in their raw form. For example, COMESA’s cotton-to-clothing initiative seeks to bring more stages of clothing production to the region instead of simply exporting raw cotton and importing finished clothing.<sup>1546</sup>

The ECOWAS strategy discusses challenges to increasing AGOA utilization and offers avenues through which the REC body can help. Many of these challenges stem from the lack of integration between countries in the community due to factors like intra-regional tariffs that prevent agroprocessing value chains from being competitive globally.<sup>1547</sup> Specifically, the strategy suggests implementing an ECOWAS AGOA committee that would report to the ECOWAS Commission of Trade.<sup>1548</sup> The major responsibilities of the AGOA committee include promoting relevant policies and programs to bolster AGOA-related sectors and overcome the identified regional challenges.

Additionally, the Kenya 2018–2023 national AGOA strategy<sup>1549</sup> mentions some key developments and plans for the East African Community (EAC), particularly those that directly affect Kenya. Chief among these is the construction of a cross-border rail network<sup>1550</sup> in the region. This would decrease the cost of intra-regional trade, making improved regional value chains possible. The document also calls for improvements in air transportation (e.g., flight connections). It notes that it is cheaper to ship goods

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<sup>1542</sup> Member states include Burundi, Comoros, the Democratic Republic of the Congo, Djibouti, Egypt, Eswatini, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, and Zimbabwe. COMESA, “COMESA Member States” (accessed October 25, 2019).

<sup>1543</sup> Member states include Benin, Burkina Faso, Cabo Verde, Côte d’Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. ECOWAS, “Member States” (accessed October 25, 2019).

<sup>1544</sup> COMESA Secretariat, *COMESA Strategy*, August 2018, 1.

<sup>1545</sup> Textiles and apparel are the examples given for light manufacturing. COMESA Secretariat, *COMESA Strategy*, August 2018, xi.

<sup>1546</sup> ITC and ACTIF, “Cotton-to-Clothing,” June 2009, 1.

<sup>1547</sup> ECOWAS, *Phase One: ECOWAS Strategy for AGOA*, 2018, 59. (For more detail on SSA agroprocessing value chains, see the case study 4.3 in chapter 4 of this report.)

<sup>1548</sup> ECOWAS, *Phase One: ECOWAS Strategy for AGOA*, 2018, 62.

<sup>1549</sup> Government of Kenya, MITC, *Kenya—National AGOA Strategy 2018-2023*, July 30, 2018, 54.

<sup>1550</sup> More information is available from the East Africa Community. EAC, “EAC Railways Sub-sector Projects” (accessed October 31, 2019).

from Kenya to China than from Kenya to the United States, but that introducing direct flights would lessen the difference for commodities that can be transported via air freight.<sup>1551</sup>

## Measuring AGOA Utilization

Measuring the effectiveness of the AGOA program involves examining exports from SSA to the United States and focusing on the goods that were exported with AGOA or GSP benefits. One common measure—the AGOA utilization rate—is defined as the value of all imports from an AGOA beneficiary country to the United States under the AGOA or GSP programs, divided by the value of all imports of AGOA- or GSP-eligible goods from that country.<sup>1552</sup> Other measures,<sup>1553</sup> such as the value of AGOA imports per capita labor force,<sup>1554</sup> indicate how important the AGOA benefits are for a country’s overall production and income, as shown in Table 8.2. The AGOA utilization rate varies significantly across countries, but there are also cases of big changes in AGOA utilization within a country over time.<sup>1555</sup> There is also a significant amount of variation between countries in terms of the value of non-petroleum AGOA imports per worker, with some countries generating tens or hundreds of dollars per worker and others generating mere cents.

The AGOA utilization rate for the SSA region is high compared with those of other U.S. trade preference programs: 86.2 percent in 2018 if crude petroleum is included among the imports, or 79.7 percent if it is not.<sup>1556</sup> For comparison, the utilization rate for the entire GSP program, not just SSA countries, was 49.6 percent in 2017.<sup>1557</sup> However, there was significant variation in AGOA utilization rates across countries in the region. While some countries like Kenya and Lesotho had 2018 utilization rates above 95 percent, Guinea-Bissau and Comoros had zero percent AGOA total utilization. In general, countries with low values of AGOA-eligible shipments tend to have low or zero AGOA total utilization, which could indicate that these countries anticipate low benefits for using the preferences relative to the costs of ensuring compliance. With only two exceptions, countries that shipped at least one million dollars of AGOA-eligible goods and services in 2018 had an AGOA utilization rate above 50 percent, and often significantly above that rate.

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<sup>1551</sup> Government of Kenya, MITC, *Kenya—National AGOA Strategy 2018-2023*, July 30, 2018, 54.

<sup>1552</sup> This measure is called total AGOA utilization in the previous iteration of this report. USITC, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Developments*, April 2018.

<sup>1553</sup> Mwangi Kimenyi, a former Brookings Institution expert, wrote a critique of the use of total utilization as the primary measure of AGOA utilization. Table 8.2 includes one of the alternatives proposed in that critique. Kimenyi, *AGOA Utilization 101*, March 23, 2015.

<sup>1554</sup> This is defined as the total value of AGOA imports to the United States from a country divided by the size of the labor force of that country.

<sup>1555</sup> To illustrate the importance of looking beyond the total AGOA utilization rate, consider the case of Botswana, as shown in table 8.2. Botswana had a 98.5 percent total AGOA utilization rate in 2016, but that fell to 0 percent for 2018. However, the vast majority of U.S. imports from Botswana are diamonds, which are not AGOA eligible but mostly come into the United States duty free. Botswana’s high total utilization rate was not based on a high volume of imports. Tralac, “AGOA and Botswana,” November 2018.

<sup>1556</sup> See Table 8.2.

<sup>1557</sup> Some GSP-eligible products may have been imported to the United States under similar preference programs or with low or zero tariffs. This can account for part of the low utilization for GSP. USITC, *The Year in Trade 2017*, August 2018, 80.

Crude petroleum accounts for 63.7 percent of imports under AGOA and GSP from SSA countries in 2018.<sup>1558</sup> Again, there is wide variation in the importance of crude petroleum across the AGOA-eligible countries. For example, crude petroleum accounts for 98.4 percent of U.S. AGOA (including GSP) imports from Angola.<sup>1559</sup> Angola has a high AGOA utilization rate when crude petroleum exports are included, but this drops significantly when excluding crude petroleum. Many other countries, such as Lesotho and Zambia, do not export any crude petroleum to the United States under AGOA.

**Table 8.2** Total AGOA utilization and AGOA imports per capita labor force, 2016 and 2018

	Total AGOA Utilization, All Imports		Total AGOA Utilization, Imports excl. oil		AGOA Imports excl. oil Per Capita Labor Force (\$)		AGOA Eligible, excl. oil (Millions \$)	
	2016	2018	2016	2018	2016	2018	2016	2018
Angola	81.0	84.4	1.0	53.6	0.14	2.67	168.5	63.5
Benin	64.9	99.4	64.9	99.4	0.03	0.38	0.2	1.8
Botswana	98.5	0.0	98.5	0.0	4.78	0.00	4.9	0.3
Burkina Faso	77.7	81.2	77.7	81.2	0.11	0.12	0.9	1.1
Cabo Verde	44.0	51.9	44.0	51.9	2.34	3.18	1.4	1.6
Cameroon	28.5	55.8	28.5	21.4	2.51	1.52	91.8	78.5
Central African Republic	( <sup>a</sup> )	0.0	( <sup>a</sup> )	0.0	( <sup>a</sup> )	0.00	( <sup>a</sup> )	0.0
Chad	100.0	93.9	0.0	0.0	0.00	0.00	0.0	0.2
Comoros	0.0	0.0	0.0	0.0	0.00	0.00	0.1	0.0
Republic of the Congo	65.4	68.2	10.2	18.0	1.89	10.95	37.2	128.4
Côte d'Ivoire	81.9	58.1	81.9	46.5	8.98	16.43	86.3	294.6
Djibouti	32.7	86.6	32.7	86.6	0.19	0.55	0.2	0.3
Eswatini	( <sup>a</sup> )	86.8	( <sup>a</sup> )	86.8	( <sup>a</sup> )	20.14	( <sup>a</sup> )	8.6
Ethiopia	96.8	79.1	96.8	79.1	1.42	3.06	71.3	200.7
Gabon	61.9	81.9	1.2	0.0	0.67	0.00	37.6	24.3
Gambia	( <sup>a</sup> )	52.7	( <sup>a</sup> )	52.7	( <sup>a</sup> )	0.04	( <sup>a</sup> )	0.1
Ghana	96.5	99.1	96.5	97.0	5.56	5.56	68.6	71.8
Guinea	47.4	29.9	47.4	29.9	0.07	0.03	0.6	0.5
Guinea-Bissau	( <sup>a</sup> )	0.0	( <sup>a</sup> )	0.0	( <sup>a</sup> )	0.00	( <sup>a</sup> )	0.0
Kenya	98.1	98.0	98.1	98.0	20.62	22.92	403.9	479.9
Lesotho	99.6	99.0	99.6	99.0	320.10	336.46	296.5	322.7
Liberia	46.9	60.1	46.9	60.1	0.08	0.03	0.3	0.1
Madagascar	88.0	93.7	88.0	93.7	7.68	14.41	110.3	207.0
Malawi	99.0	98.4	99.0	98.4	7.01	5.10	52.1	40.8
Mali	39.2	28.2	39.2	28.2	0.02	0.02	0.3	0.6
Mauritania	99.9	0.0	30.5	0.0	0.03	0.00	0.1	0.2
Mauritius	79.2	72.6	79.2	72.6	334.21	260.49	253.6	217.2
Mozambique	62.4	82.4	96.1	82.4	1.27	0.61	15.9	9.5

<sup>1558</sup> USITC calculations using data on SSA imports to the United States under AGOA from USITC DataWeb/USDOC (accessed August 6, 2019).

<sup>1559</sup> USITC calculations using data on SSA imports to the United States under AGOA from USITC DataWeb/USDOC (accessed August 6, 2019).

	Total AGOA Utilization, All Imports		Total AGOA Utilization, Imports excl. oil		AGOA Imports excl. oil Per Capita Labor Force (\$)		AGOA Eligible, excl. oil (Millions \$)	
Namibia	66.8	64.7	66.8	64.7	1.64	1.83	2.2	2.7
Niger	2.4	3.0	2.4	3.0	0.00	0.00	0.8	0.6
Nigeria	81.3	87.5	54.6	41.8	3.69	2.84	388.1	412.3
Rwanda	77.3	80.6	77.3	80.6	0.34	0.88	2.6	6.7
São Tomé and Príncipe	50.9	14.0	50.9	14.0	0.77	0.82	0.1	0.4
Senegal	85.8	96.9	85.8	96.9	0.38	8.02	1.8	34.7
Seychelles	3.7	<sup>(b)</sup>	3.7	<sup>(b)</sup>	<sup>(c)</sup>	<sup>(c)</sup>	1.1	<sup>(b)</sup>
Sierra Leone	18.4	5.2	18.4	5.2	0.30	0.57	4.0	28.7
South Africa	95.5	89.2	95.5	89.2	130.65	104.54	2,977.0	2,667.1
Tanzania	98.5	96.7	98.5	96.7	1.53	1.64	38.0	44.3
Togo	26.6	2.7	26.6	2.7	0.04	0.01	0.5	1.4
Uganda	83.8	85.4	83.8	85.4	0.11	0.28	1.9	5.3
Zambia	86.0	69.4	86.0	69.4	0.27	12.37	2.1	128.1
<b>Total</b>	<b>86.7</b>	<b>86.2</b>	<b>86.0</b>	<b>79.7</b>			<b>5,122.9</b>	<b>5,486.6</b>

Source: USITC DataWeb/USDOC (accessed March 5, 2020) and World Bank World Development Indicators.

Notes: AGOA utilization is defined as the combined value of goods imported under AGOA or GSP, divided by the combined value of goods with tariff lines eligible for AGOA or GSP benefits. Crude petroleum is imported under HTS code 2709.00. Per capita values are the value in U.S. dollars of goods imported to the United States under AGOA, excluding petroleum products (HTS 2709.00), divided by the labor force population in that AGOA-eligible country (including employment in the petroleum sector). Data on petroleum sector employment by country are not available.

<sup>a</sup> The country was not eligible for AGOA benefits for a reason other than graduating from the GSP program. USTR, Request for Public Comments on Annual Review of AGOA Benefits 2017, July 18, 2016; USTR, *Annual Review of Country Eligibility for Benefits under AGOA*, July 6, 2018.

<sup>b</sup> Country was not eligible for AGOA benefits due to graduating from the GSP program. Office of the USTR, *Annual Review of Country Eligibility for Benefits under AGOA*, July 6, 2018.

<sup>c</sup> Total labor force data were not available in the World Development Indicators database used for this calculation.

## Recent Developments in Regional Integration<sup>1560</sup>

### Background on Regional Integration in Africa

Many African governments are actively working to increase intra-African trade (African countries trade with each other) via regional integration, typically through the establishment of free trade areas. They are doing so because of several desirable characteristics of intra-African trade. Currently, Africa's total merchandise trade is concentrated in natural resources and African exports are mostly destined for only

<sup>1560</sup> Unless otherwise noted, this section is based on USITC, "Selected AGOA Strategies and Recent Developments in SSA Regional Integration," which is chapter 6 in USITC, *U.S. Trade and Investment with Sub-Saharan Africa*, 2017. The African Union's regional integration efforts are continent-wide in scope. Thus, unless otherwise mentioned, the data in this section cover five North African countries—Algeria, Egypt, Libya, Morocco, and Tunisia—as well as SSA.

10 trading partners.<sup>1561</sup> The product and market concentration of African goods trade leaves countries in the Africa region vulnerable to external shocks.<sup>1562</sup> By contrast, intra-African trade is less concentrated in natural resources, higher in manufacturing content and high-technology products, and more resilient against external shocks.<sup>1563</sup>

Policy makers view intra-African trade as having room for improvement. Compared to intra-regional trade in the European Union and the Association of Southeast Asian Nations, intra-African trade is limited in size, although it is growing rapidly from a small base and is comparable to regions with similar levels of development (e.g., members of the Southern Common Market, Mercosur).<sup>1564</sup> Two main obstacles—a lack of complementary exports among African countries and weak regional value chains<sup>1565</sup>—prevent African governments from increasing intra-African trade.<sup>1566</sup>

Other regional challenges in Africa include difficulty achieving economies of scale, relatively high regional tariffs, and high costs of doing business. SSA, for example, is composed of 49 economies—many of them small, and some of them landlocked—each with its own tariffs and customs procedures.<sup>1567</sup> Tariffs that SSA exporters face exporting to other countries within the region can be substantial.<sup>1568</sup> At the same time, the poor condition of transportation infrastructure, customs paperwork requirements, and frequent roadblocks at border crossings or customs checkpoints in SSA translate into higher transaction costs in Africa than in other developing regions.<sup>1569</sup> According to an industry representative, Coca-Cola has been unable to transport soda syrup from its own plants in Nigeria to nearby Ghana due

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<sup>1561</sup> In 2016, according to a 2019 UNCTAD report, “56 percent of Africa’s trade was in natural resources.” UNCTAD does not specify the 10 major partners. UNCTAD, *Key Statistics and Trends in Regional Trade in Africa*, 2019, 4.

<sup>1562</sup> UNCTAD, *Key Statistics and Trends in Regional Trade in Africa*, 2019, 4.

<sup>1563</sup> UNCTAD, *Key Statistics and Trends in Regional Trade in Africa*, 2019, 25–30.

<sup>1564</sup> Intra-African trade was valued at \$129 billion and made up 15.4 percent of all of Africa’s total merchandise trade (exports plus imports) in 2016. In comparison, the EU had intra-bloc trade of 61.7 percent and ASEAN 23.3 percent that year. Mercosur had intra-bloc trade of 14.5 percent in 2016. UNCTAD, *Key Statistics and Trends in Regional Trade in Africa*, 2019, 3.

<sup>1565</sup> Chapter 4 of this report describes regional value chains in SSA and presents case studies on three sectors where regional value chains are prevalent.

<sup>1566</sup> UNCTAD, *Economic Development in Africa: Intra-African Trade*, 2013, 51.

<sup>1567</sup> Hartzenberg, “Regional Integration in Africa,” 2011, 3.

<sup>1568</sup> One source states that goods trade within Africa (among individual countries) face an average tariff of 6.1 percent; while another source UNCTAD states that African goods face an average tariff of 2.5 percent when they are exported to external markets. Luke, “Chapter 1: Making the Case for the African Continental Free Trade Area,” 2019, 5; UNCTAD, *Economic Development in Africa: Intra-African Trade*, 2013, 51.

<sup>1569</sup> The average cost of shipping a container from an African country to an overseas country is \$2,000, which compares unfavorably with the average cost of \$900 to ship a container from Asia to an overseas country. As an example of ground transport issues, African trucks faced 47 roadblocks on a typical trip between the inland city of Kigali, Rwanda, and the port city of Mombasa, Kenya (1,470 km) in 2012. Mo Ibrahim Foundation, *Regional Integration: Uniting to Compete*, 2014, 20; Ben Barka, *Border Posts, Checkpoints, and Intra-African Trade*, January 2012.

to the frequency and expense of various roadblocks at customs checkpoints; instead, the company resorts to shipping syrup from Eswatini to Ghana.<sup>1570</sup>

## African Continental Free Trade Area

### Background

The groundwork for the African Continental Free Trade Area (AfCFTA) was laid decades ago, and initial progress was slow. Once negotiations for the text of the agreement began, however, they moved quickly. The Abuja Treaty, which was signed in 1991 and entered into force in 1994, serves as the foundational legal document for continent-wide regional integration under the Organization of African Unity (the AU's predecessor).<sup>1571</sup> This treaty set in motion the operational plan to use the AU-recognized RECs as stepping stones to an African Economic Community, but did not specifically mention the African Continental Free Trade Area.<sup>1572</sup> In January 2012, at its 18th Ordinary Session of the Assembly of Heads of State and Government, the AU decided to fast-track an AfCFTA and agreed to an *Action Plan for Boosting Intra-African Trade*, which set up a plan for negotiating such an agreement.<sup>1573</sup> The AU views the AfCFTA as a way to resolve overlapping REC memberships and accelerate economic integration in the region;<sup>1574</sup> once fully implemented, the AfCFTA is intended to eliminate duties on 90 percent of the tariff lines on goods traded among the members.<sup>1575</sup> The AU first announced AfCFTA negotiations in 2015,<sup>1576</sup> and by March 21, 2018, 44 out of 55 members had signed the consolidated text of the

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<sup>1570</sup> Industry representative, telephone interview by USITC staff, September 19, 2018. More information about agroprocessing value chains can be found in case study 4.3 of chapter 4 of this report.

<sup>1571</sup> The formation of the Organization of African Unity in 1963 provided a continent-wide institution to work on regional integration efforts, and the 1979 Monrovia Summit and 1980 Lagos Plan of Action presented the concept of an integrated African continent as a political program. Gérard, MacLeod, and Desta, "The AfCFTA as Yet Another Experiment," 2019, 15; UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 1; AU, "Treaty Establishing the African Economic Community" (accessed October 10, 2019).

<sup>1572</sup> The African Union refers to the Arab Maghreb Union (known by its French acronym, UMA), the Community of Sahel-Saharan States (known by its French acronym, CEN-SAD), the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS), the Intergovernmental Authority on Development (IGAD), and the Southern African Development Community (SADC) as "AU-recognized" RECs. The RECs have developed independently and have varying structures and roles; some of the RECs (e.g., ECOWAS, ECCAS, and UMA) were established before the Abuja Treaty. In 2006, the AU put a moratorium on the recognition of regional economic communities. AU, "Regional Economic Communities" (accessed April 13, 2018); Mo Ibrahim Foundation, *Regional Integration: Uniting to Compete*, 2014, 7–10; AU, "Decision on the Moratorium," July 1–2, 2006.

<sup>1573</sup> AU, "CFTA—Continental Free Trade Area" (accessed October 18, 2019); UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 40.

<sup>1574</sup> AU, "CFTA—Continental Free Trade Area" (accessed October 18, 2019).

<sup>1575</sup> UNECA, *Assessing Regional Integration in Africa IX*, July, 2019, 40–41; AU, *Report on the African Continental Free Trade Area*, February 10–11, 2019, 2; Chiumya, Phone Call with Acting Head of Trade Department at the African Union, via the Office of the United State Trade Representative, Office of African Affairs, February 2, 2020.

<sup>1576</sup> UNCTAD, "The Continental Free Trade Area: Making It Work," December 2015, 1.

agreement.<sup>1577</sup> According to the Trade Law Center (Tralac) the consolidated text is a version of the agreement that the AU members were using to further negotiations; it contains the Agreement establishing the AfCFTA, the Protocol on Trade in Goods, the Protocol on Trade in Services, and the Protocol on Rules and Procedures on the Settlement of Disputes.<sup>1578</sup> As of October 2019, 54 of 55 AU members are signatories; the only AU member country that has not signed the consolidated text of the agreement is Eritrea.<sup>1579</sup>

Signing the consolidated text does not bind countries to the agreement, the latter of which is only achieved through ratification by individual countries' legislative institutions; rather signing the consolidated text is a commitment to negotiate. Thus far, countries that have ratified have agreed to reduce tariffs on 90 percent of goods and have agreed to priority service sectors. However, they have yet to negotiate the specific tariff schedules for these goods and the specific methods for reducing non-tariff barriers for services.

## Status, Structure, and Next Steps

The AfCFTA entered into force on May 30, 2019 for the members that have deposited their ratification instruments to the AU Commission. As of February 19, 2020, there are 28 of these members that have approved the agreement, as it currently stands, through their countries' respective legislative processes and deposited their official documents with the AU Commission Chairperson.<sup>1580</sup> "Entry into force" means that these countries have ratified the Protocol on Trade in Goods, the Protocol on Trade in Services, and the Protocol on Rules and Procedures on the Settlement of Disputes.<sup>1581</sup> But as of March 2020, the members of the free trade area still needed to negotiate many aspects of the agreement.<sup>1582</sup> According to the United Nations Economic Conference for Africa (UNECA), the AfCFTA has three layers. The first, shown in figure 8.1, is the framework agreement, which lays out definitions and scope. The second includes the protocols that contain the substance and operational obligations and objectives of the agreement, as well as the exceptions to these obligations. The third layer contains the annexes that provide more details for the protocol (e.g., the annex on rules of origin) and gives guidance for the

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<sup>1577</sup> Tralac, "AU, "Indication of Legal Instruments Signed at the 10th Extraordinary Session," March 21, 2018. See also the consolidated text of the agreement. AU, "Agreement Establishing the African Continental Free Trade Area," March 21, 2018.

<sup>1578</sup> Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1579</sup> AU, "List of Countries Which Have Signed, Ratified/Acceded to the Agreement Establishing the African Continental Free Trade Area," October 8, 2019; Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1580</sup> Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019; UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 40–41; AU, *Report on the African Continental Free Trade Area*, February 10–11, 2019, 2; Chiumya, Phone Call with Acting Head of Trade Department at the African union, via the Office of the United States Trade Representative, Office of African Affairs, February 19, 2020.

<sup>1581</sup> AU, "Agreement Establishing the African Continental Free Trade Area," March 21, 2018; Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1582</sup> AfCFTA status and developments in this section are based on research gathered through February 19, 2020. The AU has an Extraordinary Summit planned for May 2020 that may lead to new developments for the agreement as well as its protocols and annexes.

protocol on trade in goods and services.<sup>1583</sup> In Phase 1, members will continue working on the details of the annexes of these first three protocols as well as pursue the initial negotiations of the Phase II Protocols<sup>1584</sup> during the implementation and operational stages of the agreement (figure 8.1).<sup>1585</sup> The AfCFTA members also added a Phase III for the agreement that will focus on negotiation of the Protocol for Digital Trade.<sup>1586</sup> Figure 8.2, shows the 28 AU members that have deposited their instruments to ratify the AfCFTA with the AU Commission; these countries account for 51 percent of AU members.

Two important things should be noted about the agreement: (1) The AfCFTA does not have its own supranational organization, and (2) it will not replace the agreements of the RECs, as stated explicitly in Article 19 of the AfCFTA agreement.<sup>1587</sup> The African Union Assembly, composed of the heads of state and government for the various member states, is the overarching institution of the AfCFTA. This means that all AU member countries are still a part of the negotiating process, even those that have not signed the consolidated text or ratified the agreement.<sup>1588</sup> The agreement also provides for the continuation of the RECs by stating that for REC members that “have attained among themselves higher level of regional integration than under this Agreement, shall maintain such levels of higher integration amongst themselves.”<sup>1589</sup>

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<sup>1583</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 43–44.

<sup>1584</sup> The AfCFTA Phase II protocols on intellectual property rights, competition policy, and investment.

<sup>1585</sup> Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

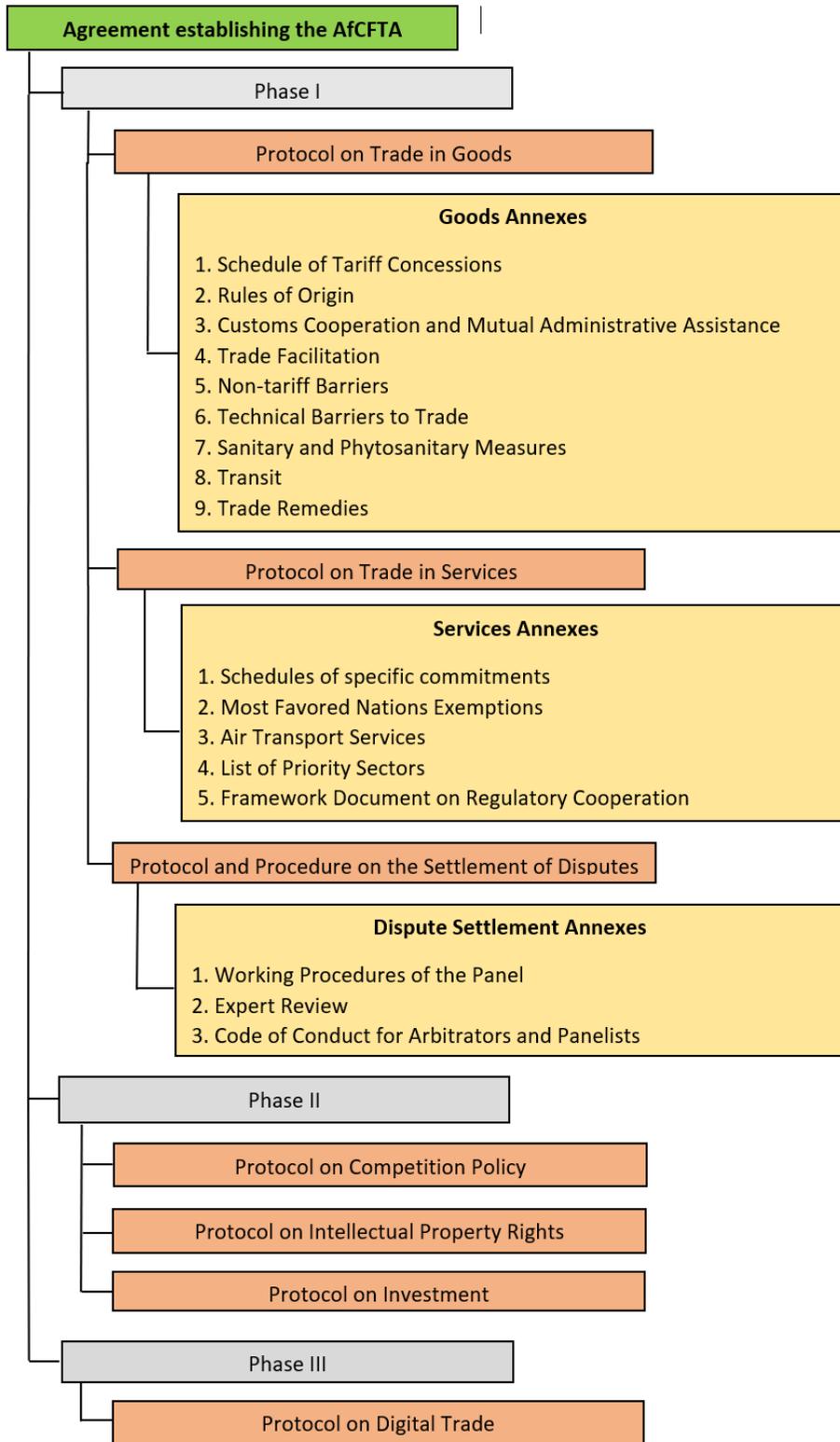
<sup>1586</sup> Chiumya, Phone Call with Acting Head of Trade Department at the African Union, via the Office of the United State Trade Representative, Office of African Affairs, February 2, 2020.

<sup>1587</sup> Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1588</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 44–46.

<sup>1589</sup> AU, “Agreement Establishing the African Continental Free Trade Area,” March 21, 2018, 13.

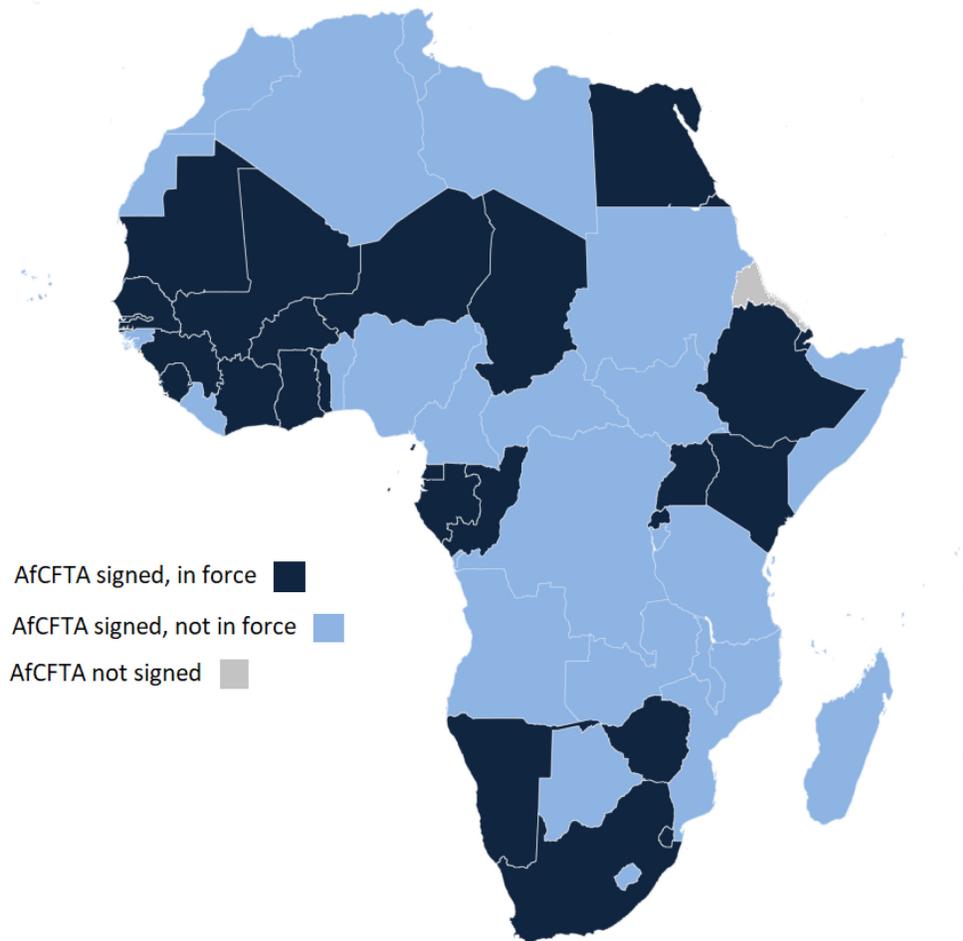
**Figure 8.1** The AfCFTA agreement, protocols and annexes



Source: Compiled by USITC from Tralac, "The African Continental Free Trade Area: A Tralac Guide," June 2019.

Note: Note: In 2020 the AfCFTA members agreed on a Phase III for the agreement, which will develop the Protocol for Digital Trade.

**Figure 8.2** Map of the African Continental Free Trade Area



Source: Compiled by USITC from Tralac, “African Continental Free Trade Area (AfCFTA) Legal Texts and Policy Documents” (accessed October 17, 2019); AU, “List of Countries Which Have Signed,” October 8, 2019.

Note: The Saharawi Republic (or Sahrawi Arab Democratic Republic) is officially referred to by the U.S. government as Western Sahara, the political status of which is considered undetermined by the United States. CIA, “Western Sahara” (accessed January 27, 2019).

The negotiations for the Phase I annexes are in progress as of February 2020. Phase II negotiations began in October 2019 and are planned to culminate in the adoption of legal instruments for intellectual property rights, competition policy, and investment by June 2020.<sup>1590</sup> The Phase II protocols are intended to establish cooperation and do not feature binding commitments.<sup>1591</sup> Negotiations for the Phase III Protocol on Digital Trade will begin once Phase II is concluded.<sup>1592</sup>

<sup>1590</sup> AU, *Report on the African Continental Free Trade Area*, February 10–11, 2019.

<sup>1591</sup> Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1592</sup> Chiumya, Phone Call with Acting Head of Trade Department at the African Union, via the Office of the United State Trade Representative, Office of African Affairs, February 19, 2020.

The AfCFTA members have planned to liberalize 90 percent of tariff lines. However, the schedules of tariff concessions for liberalization are still under negotiation (as of February 19, 2020).<sup>1593</sup> The AU has assigned five regional technical teams to assist member countries in completing their schedules of tariff concessions and rules of origin by May 2020.<sup>1594</sup> The remaining 10 percent of tariff lines are divided into excluded products (these will not exceed 3 percent of total tariff lines) and sensitive products (these are products that meet AfCFTA qualifications for food security, national security, fiscal revenue, livelihood, and industrialization and will not exceed 7 percent of tariff lines).<sup>1595</sup> Each member country has the ability to determine the tariff lines included in the excluded and sensitive product categories.<sup>1596</sup> Trade under the agreement is scheduled to begin July 2020, or once members have finalized the tariff schedules for goods, and the preferential tariff rates will apply only to countries that have ratified the agreement.<sup>1597</sup>

In regard to the trade in services annex, June 2021 is the target deadline for adopting regulatory frameworks; January 2022, for adopting the schedules of specific commitments.<sup>1598</sup> Thus far, AU has agreed on the five services sectors to be designated as priority sectors: business services, communication, financial services, tourism/travel, and transport.<sup>1599</sup>

According to the UN's *Assessing Regional Integration in Africa IX* report, the RECs and various African Customs Unions have "observer-like status" in the AfCFTA negotiations, and the REC secretariats are able to influence the AfCFTA via the AfCFTA Continental Taskforce. As mentioned earlier, the various RECs (including the Tripartite Free Trade Area discussed in the next section) will continue trading under their respective trading regimes under the AfCFTA. That is, while the continental free trade area supersedes the RECs in principle, if an REC has achieved further regional integration, the AfCFTA does not cancel out those efforts.<sup>1600</sup> The guiding article for the relationship between the RECs and the AfCFTA is Article 19, which notes that RECs with a higher level of integration will "persist as islets of higher integration" until the rest of the region catches up to them.<sup>1601</sup> The following section provides an overview of some of the recent developments affecting these RECs.

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<sup>1593</sup> UNECA, *Assessing Regional Integration in Africa IX*, July, 2019, 40-41; AU, *Report on the African Continental Free Trade Area*, February 10–11, 2019, 2; Chiumya, Phone Call with Acting Head of Trade Department at the African Union, via the Office of the United State Trade Representative, Office of African Affairs, February 2, 2020. Liberalization of tariff lines means "for products subject to liberalization, State Parties, shall not impose new import duties or charges having equivalent effect on goods originating from the territory of another State Party, including any form of surtax and surcharge." For more information see the consolidated text of the AfCFTA, Part III, Article 7, which lists some charges and duties that are not considered "import duties" by the agreement. AU, "Agreement Establishing the African Continental Free Trade Area," March 21, 2018.

<sup>1594</sup> Chiumya, Phone Call with Acting Head of Trade Department at the African Union, via the Office of the United State Trade Representative, Office of African Affairs, February 2, 2020.

<sup>1595</sup> Sensitive products have a longer timeline for liberalization; excluded products are exempt from liberalization but may be reviewed at a later time. UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 40, 87.

<sup>1596</sup> TRALAC representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1597</sup> TRALAC representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1598</sup> AU, *Report on the African Continental Free Trade Area*, February 10–11, 2019.

<sup>1599</sup> Tralac representatives, interview by USITC staff, Cape Town, South Africa, September 9, 2019.

<sup>1600</sup> Tralac, "The Institutional Implications of Article 19 of the AfCFTA—Where Do the Regional Economic Communities Fit In?" September 13, 2019.

<sup>1601</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 52–53.

## Tripartite Free Trade Area

The Tripartite Free Trade Area (TFTA) is a free trade area between COMESA, the East African Community (EAC), and the Southern African Development Community (SADC). It grants most-favored-nation status to members and features a timetable to gradually phase out tariffs over time among members.

COMESA, EAC, and SADC launched negotiations on this trade area in June 2011 and finalized the text of the agreement on June 10, 2015.<sup>1602</sup> As of January 2020, there are 29 potential TFTA member states.<sup>1603</sup> For the agreement to go into effect, it must be ratified by 14 of these member states' parliaments. As of January 2020, 8 countries had ratified the agreement (Botswana, Burundi, Egypt, Kenya, Namibia, South Africa, Uganda, and Rwanda).<sup>1604</sup> As noted above, the AfCFTA supersedes the TFTA.<sup>1605</sup>

Several TFTA negotiations are still in progress. EAC-Egypt and EAC-SACU completed tariff negotiations for the TFTA in 2019, while SACU and Egypt tariff negotiations are close to completion.<sup>1606</sup> Negotiations on rules of origin, nontariff trade barrier mechanisms, the implementation of trade remedies, and customs forms are still under way.

## Regional Economic Communities

Before the AfCFTA's recent implementation, the AU's regional integration milestones for the regional economic communities (RECs) were the main benchmarks for gauging regional integration in sub-Saharan Africa. These milestones include the establishment of a customs union, a common market, a monetary union, and a political federation. The RECs have had varying levels of progress achieving those milestones.<sup>1607</sup> A common concern for the RECs in sub-Saharan Africa is the proliferation of RECs and overlapping country memberships.<sup>1608</sup> This section provides a brief overview of regional integration in several key RECs, emphasizing any recent developments that have occurred since the prior version of this report.

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<sup>1602</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 13.

<sup>1603</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 13; COMESA, "Latest News: More Countries Ratify Tripartite Free Trade Agreement," January 17, 2020.

<sup>1604</sup> Bishumba, "Rwanda Ratifies Tripartite Free Trade Area Agreement," July 11, 2019. COMESA, "Latest News: More Countries Ratify Tripartite Free Trade Agreement," January 17, 2020.

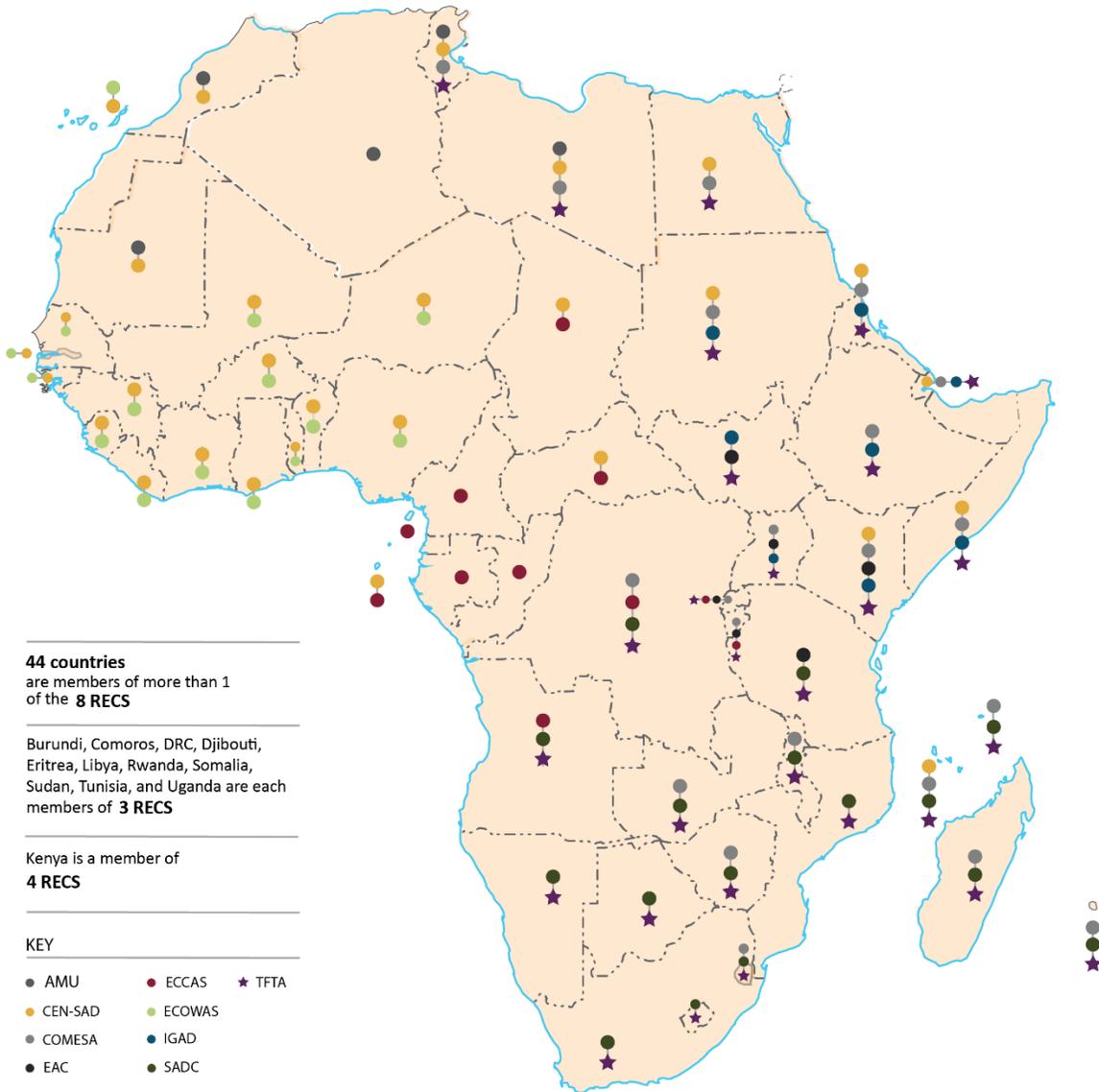
<sup>1605</sup> Tralac, "The Institutional Implications of Article 19 of the AfCFTA," September 13, 2019.

<sup>1606</sup> See UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 13; Tralac, "Conclusion of the Bilateral Tariff Negotiations between SACU and the EAC," June 07, 2019.

<sup>1607</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 1–2.

<sup>1608</sup> For more information, see figure 8.3 and refer to Mengistu's 2015 paper, "Multiplicity of African Regional Economic Communities and Overlapping Memberships: A Challenge for African Integration," which analyzes the multiplicity of African RECs and overlapping membership.

**Figure 8.3** Map of Africa’s Regional Economic Communities (RECs) and their overlapping memberships



Sources: AU, “Member States” (accessed February 5, 2020); AMU, “Member States” (East African Community); AUC, *Africa Regional Integration Index Report*, 2016, 13; UNECA, “CEN-SAD—The Community of Sahel-Saharan States” (accessed February 5, 2020); COMESA, “COMESA Member States” (accessed February 5, 2020); EAC, “Partner States” (accessed February 5, 2020); ECCAS, “Etats Membres (Member States)” (accessed February 5, 2020); ECOWAS, “Member States” (accessed February 26, 2020); IGAD, “About Us” (accessed February 26, 2020); SADC, “Member States” (accessed February 5, 2020); COMESA, “Latest News: More Countries Ratify Tripartite Free Trade Agreement,” January 17, 2020.

## East African Community<sup>1609</sup>

Six members: Burundi, Kenya, Rwanda, South Sudan, Tanzania, and Uganda

The East African Community (EAC) agreement was signed in 1999, and the community has been on track since then toward its regional integration milestones of a customs union, common market, monetary union, and political federation.<sup>1610</sup> EAC member states established a free trade area in 2000, and their customs union protocol was fully functional by 2010.<sup>1611</sup> All EAC members apply value-added taxes and excise duties applying to goods and services, including imports.<sup>1612</sup> Starting in 2013, the EAC and the United States entered a trade facilitation partnership via the “Trade Africa” initiative.<sup>1613</sup> As of October 2019, the EAC started working towards an East African Federation initiative to create an economic and political bloc in east Africa.<sup>1614</sup>

## The Southern African Development Community<sup>1615</sup>

Sixteen members: Angola, Botswana, Comoros, the Democratic Republic of the Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia, and Zimbabwe

Established in 1980, the Southern African Development Community (SADC) re-branded itself as a development-oriented REC in 1992.<sup>1616</sup> Notably, Angola and the Democratic Republic of the Congo are not signatories of the SADC free trade area.<sup>1617</sup> SADC missed both its 2010 and 2013 deadlines for establishing a customs union due to difficulties implementing a common external tariff (CET), which is a common set of import duty rates applied on goods from third countries.<sup>1618</sup> Since 2018, however, SADC has increased both intra-regional and extra-regional trade while implementing its *Industrialization Strategy and Roadmap 2015–2063*.<sup>1619</sup> In August 2019, SADC also signed three agreements seeking to

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<sup>1609</sup> EAC, “About the EAC” (accessed September 27, 2019).

<sup>1610</sup> EAC, “Overview of EAC” (accessed September 27, 2019).

<sup>1611</sup> A customs union builds on a free trade area because it features a common external tariff, which entails a common set of import duty rates applied to goods from third countries. EAC, “Customs Union” (accessed September 27, 2019); EAC, “Overview of the EAC” (accessed September 27, 2019).

<sup>1612</sup> The standard value-added tax (VAT) ranges up to 20 percent in Tanzania. Reduced rates are in place for Kenya (12 percent) and Uganda (6 percent). Tralac, “Trade Policy Review: East African Community (Burundi, Kenya, Rwanda, Tanzania, and Uganda),” March 21, 2019.

<sup>1613</sup> USTR, *2016 Biennial Report on the Implementation of the Africa Growth and Opportunity Act*, June 2016, 62.

<sup>1614</sup> EAC, “Current Status” (accessed September 27, 2019).

<sup>1615</sup> SADC, “Member States,” September 27, 2019.

<sup>1616</sup> SADC, “Facts and Figures” (accessed September 27, 2019).

<sup>1617</sup> SADC, “Free Trade Area” (accessed September 27, 2019).

<sup>1618</sup> SADC, “Customs Union” (accessed September 27, 2019).

<sup>1619</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 8.

promote job creation, sustainable growth, and intra-regional investment, especially for small and medium-sized enterprises.<sup>1620</sup>

## Economic Community of West African States<sup>1621</sup>

Fifteen members: Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo

The Economic Community of West African States (ECOWAS) was first established as regional economic bloc in 1975 and revised in 1993. It has been a free trade area since 1990.<sup>1622</sup> In June 2007, ECOWAS launched its “Vision 2020,” which includes a CET and customs union.<sup>1623</sup> In January 2015, ECOWAS announced the first phase of implementation for its CET.<sup>1624</sup> All members of ECOWAS except Cabo Verde have implemented the CET.<sup>1625</sup> As of November 2018, the 15 member states had approved 1,708 products to benefit from their ECOWAS trade liberalization scheme.<sup>1626</sup>

## Arab Maghreb Union<sup>1627</sup>

Five members: Algeria, Libya, Mauritania, Morocco, and Tunisia

The Arab Maghreb Union was founded in 1989, and adopted a free trade area in 1991.<sup>1628</sup> However, a summit between the Arab Maghreb Union heads of state has not taken place since 1994.<sup>1629</sup> In 2013, the REC announced an investment bank with \$100 million in capital to fund infrastructure projects in the region; however, there are no recent status updates on the investment bank’s activities.<sup>1630</sup>

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<sup>1620</sup> These SADC agreements are Support to Improving the Investment and Business Environment (SIBE), Trade Facilitation Programme (TFP), and Support to Industrialization and Productive Sectors (SIPS). SADC, “SADC and European (EU) Sign Three New Programmes,” August 18, 2019.

<sup>1621</sup> ECOWAS, “Basic Information” (accessed September 27, 2019).

<sup>1622</sup> ECOWAS, “History” (accessed September 27, 2019); ETLs, “About ETLs” (accessed October 8, 2019).

<sup>1623</sup> ECOWAS, “Vision 2020” (accessed September 27, 2019).

<sup>1624</sup> The ECOWAS common external tariff (CET) would supersede CETs from other regional blocs. For example, the eight countries in ECOWAS that also belong to the West African Economic and Monetary Union (WAEMU) will now use the ECOWAS CET protocol.

<sup>1625</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 7–8.

<sup>1626</sup> *Assessing Regional Integration in Africa IX*, July 2019, 7–8.

<sup>1627</sup> The UMA acronym is from the French name for the union—*l’Union du Maghreb Arabe*. UMA, “L’Union du Maghreb Arabe” (accessed September 30, 2019).

<sup>1628</sup> UMA, “L’Union du Maghreb Arabe” (accessed September 30, 2019).

<sup>1629</sup> AU Commission, *The Status of Integration in Africa V (SIA V)*, 2014, 3.

<sup>1630</sup> Prieur and Felix, “Arab Maghreb Union States Create Investment Bank,” January 9, 2013.

## Intergovernmental Authority on Development<sup>1631</sup>

Eight members: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda

The Intergovernmental Authority on Development was founded in 1996 following episodes of conflict and famine in member countries in the 1980s.<sup>1632</sup> In recent years, it has prioritized peace and security issues. The REC members have provided mediation and monetary support for peace processes in South Sudan and Somalia, most notably through their “Conflict Early Warning and Response Mechanism” institutions.<sup>1633</sup>

## Economic Community of Central African States<sup>1634</sup>

Eleven members: Angola, Burundi, Cameroon, the Central African Republic, Chad, the Republic of the Congo, the Democratic Republic of the Congo, Equatorial Guinea, Gabon, Rwanda, and São Tomé and Príncipe

The Economic Community of Central African States began functioning in 1985, but has had difficulty implementing its REC requirements due to financial difficulties and conflict.<sup>1635</sup> In 2004, the REC launched a free trade area, but since has not met its deadlines for implementation.<sup>1636</sup> Ongoing conflict in the Democratic Republic of the Congo has caused particular difficulties in setting up a free trade area and CET, as Rwanda and Angola fought on opposing sides in this conflict, causing Rwanda to leave and then re-enter the REC.<sup>1637</sup>

## Common Market for Eastern and Southern Africa<sup>1638</sup>

Twenty-one members: Burundi, Comoros, the Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Eswatini, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, and Zimbabwe

COMESA first formed as an institution in 1994 in order to replace an old preferential trade area in the region.<sup>1639</sup> Although COMESA has the name “common market,” it does not yet have all of the

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<sup>1631</sup> IGAD, “About Us” (accessed September 30, 2019).

<sup>1632</sup> IGAD, “About Us” (accessed September 30, 2019).

<sup>1633</sup> IGAD, “About CEWARN” (accessed September 30, 2019).

<sup>1634</sup> AU, “Economic Community of Central African States” (accessed September 30, 2019).

<sup>1635</sup> AU, “Economic Community of Central African States” (accessed September 30, 2019).

<sup>1636</sup> AU Commission, *The Status of Integration in Africa V (SIA V)*, 2014, 3.

<sup>1637</sup> See AU, “Economic Community of Central African States” (accessed September 30, 2019); Mwai, “Rwanda Re-admitted into ECCAS,” May 27, 2015.

<sup>1638</sup> COMESA, “COMESA Objectives and Priorities” (accessed September 30, 2019).

<sup>1639</sup> COMESA, “COMESA Objectives and Priorities” (accessed September 30, 2019).

components of a common market.<sup>1640</sup> The free trade area has been in effect since 2000, and 16 of the 21 member states (all but Eritrea, Eswatini, Ethiopia, Tunisia, and Somalia) belong to the free trade area as of September 2019.<sup>1641</sup> Tunisia joined COMESA in 2018, and the country plans to integrate into the free trade area over time, which would bring the number of members to 17.<sup>1642</sup> COMESA launched its customs union initiative in 2009, but has missed its deadlines since then.<sup>1643</sup> Recently, COMESA has increased its efforts for regional integration. It has resolved reported nontariff barriers, removed foreign exchange restrictions, and expedited customs and border formalities.<sup>1644</sup> COMESA has also implemented a plan for a Digital Free Trade Area, an online platform to promote electronic commerce in the COMESA bloc.<sup>1645</sup>

## Community of Sahel-Saharan States<sup>1646</sup>

Twenty-nine members: Benin, Burkina Faso, Cabo Verde, the Central African Republic, Chad, Comoros, Côte d'Ivoire, Djibouti, Egypt, Eritrea, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Libya, Mali, Mauritania, Morocco, Niger, Nigeria, São Tomé and Príncipe, Senegal, Sierra Leone, Somalia, Sudan, Togo, and Tunisia

The Community of Sahel-Saharan States was established in 1998. Its member countries agreed to a free trade area in 2007, but missed their 2010 deadline for implementation.<sup>1647</sup> The REC has not had a summit since 2013, when it primarily focused on peace and security in the Central African Republic, Libya, Mali, Somalia, South Sudan, and Sudan.<sup>1648</sup> The Community of Sahel-Saharan States has a regional investment bank, “Le Groupe Banque Sahélo-Saharienne pour l’Investissement et le Commerce” (or Groupe BSIC), which funds infrastructure projects to support regional integration.<sup>1649</sup>

<sup>1640</sup> A common market as defined by the African Economic Community roadmap includes a free trade area, a common external tariff, and free factor movement (e.g., labor mobility).

<sup>1641</sup> COMESA, “Countries Participating in the COMESA FTA Set to Increase” (September 27, 2019).

<sup>1642</sup> COMESA, “Countries Participating in the COMESA FTA Set to Increase” (September 27, 2019).

<sup>1643</sup> Zamfir, “The Tripartite Free Trade Area Project,” March 2015.

<sup>1644</sup> UNECA, *Assessing Regional Integration in Africa IX*, July 2019, 10.

<sup>1645</sup> Tralac, “Comesa to Set Up Team on Digital Free Trade Area,” July 26, 2018.

<sup>1646</sup> AU, “Regional Economic Communities” (accessed January 23, 2020).

<sup>1647</sup> See AU, “CEN SAD” (accessed September 30, 2019) and AU Commission, *The Status of Integration in Africa IV (SIA IV)*, 2013, 30.

<sup>1648</sup> AU, “CEN SAD” (accessed September 30, 2019).

<sup>1649</sup> Groupe BSIC, “Le Groupe” (accessed October 8, 2019).

## Other Relevant Regional Economic Blocs

### Southern African Customs Union<sup>1650</sup>

Five members: Botswana, Eswatini, Lesotho, Namibia, and South Africa

The Southern African Customs Union (SACU) was established in 1910, making it the oldest customs union in the world. All members except Botswana belong to the common monetary area.<sup>1651</sup>

### West African Economic and Monetary Union<sup>1652</sup>

Eight members: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo

The West African Economic and Monetary Union (WAEMU) was established in 1996, and it was among the early adopters of the ECOWAS free trade area. In 2000, these members established a customs union that features a CET.<sup>1653</sup> This REC also has an established monetary union.<sup>1654</sup>

### Economic and Monetary Community of Central Africa<sup>1655</sup>

Six members: Cameroon, Central African Republic, Chad, the Republic of the Congo, Equatorial Guinea, and Gabon

Established in 1999, the Economic and Monetary Community of Central Africa uses the Central African CFA franc as a unified currency.<sup>1656</sup>

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<sup>1650</sup> SACU, "About SACU" (accessed September 30, 2019).

<sup>1651</sup> SACU, "About SACU" (accessed September 30, 2019).

<sup>1652</sup> Also known under the French acronym, UEMOA. WAEMU, "About UEMOA" (accessed September 30, 2019).

<sup>1653</sup> Goretti and Weisfeld, "Trade in the WAEMU," March 2008.

<sup>1654</sup> Page and Bilal, "Regional Integration in West Africa," September 2001.

<sup>1655</sup> International Democracy Watch, "Central African Economic and Monetary Union" (accessed September 30, 2019).

<sup>1656</sup> International Democracy Watch, "Central African Economic and Monetary Union" (accessed September 30, 2019).



## Bibliography

- Abate, Tsegede. "Maize in Kenya: Chance for Getting Back to Former Glory?" *DT Maize* 4, no. 3 (September 2015): [https://repository.cimmyt.org/xmlui/bitstream/handle/10883/4477/57029-2015%20v4\(3\).pdf](https://repository.cimmyt.org/xmlui/bitstream/handle/10883/4477/57029-2015%20v4(3).pdf).
- Abdo, Ghassan, Melissa Fremeijer, and Venkatesh Mahale. *Worldwide Content Delivery Network Services Forecast, 2019–2023*. International Data Corporation (IDC) Market Forecast, May 2019 (fee required).
- Abdo, Muradu. "Legislative Protection of Property Rights in Ethiopia: An Overview." *Mizan Law Review* 7, no. 2 (December 2013): 165-206. <https://www.ajol.info/index.php/mlr/article/viewFile/108304/98123>.
- Aboa, Ange, and Maytaal Angel. *Chocolate Makers Face Ethical Branding Dilemma*. Reuters, October 15, 2019. <https://www.reuters.com/article/us-chocolate-makers-west-africa-sustaina/chocolate-makers-face-ethical-branding-dilemma-idUSKBN1WU1E7>.
- AB InBev. *2018 Annual Report*, 2019. <https://ab-inbev.com/investors/annual-reports.html>.
- Ab Inbev. "Contact." <https://www.ab-inbev.com/contact.html> (accessed March 5, 2020).
- AccessNow. "Shutdown Tracker Optimization Project." June 2018. <https://www.accessnow.org/cms/assets/uploads/2018/06/Shutdown-Tracker-Optimization-Project-11-Jun-2018-edition.xlsx>.
- AccessNow. "What Is an Internet Shutdown?" <https://www.accessnow.org/keepiton/#problem> (accessed September 27, 2019).
- Acosta, Tim. "Corpus Christi Polymers Set to Resume Work on M&G Plant in May." *Corpus Christi Caller Times*, February 19, 2019. <https://www.caller.com/story/news/local/2019/02/21/corpus-christi-polymers-set-resume-work-m-g-plant-may/2939476002/>.
- Adams & Adams. "Ethiopia Has Introduced an Online Trade Mark Filing System." <https://www.adams.africa/adams-africa-news/ethiopia-has-introduced-an-online-trade-mark-filing-system/> (accessed January 9, 2020).
- Adams & Adams. "Trade Marks in Ethiopia—What You Need to Know." July 4, 2018. <https://www.lexology.com/library/detail.aspx?g=85369ca9-43be-422c-80b8-ab4039a3f5fa>.
- AFL Hyperscale. "What Is a Data Center?" <https://www.aflhyperscale.com/understanding-different-types-of-data-center> (accessed December 18, 2019).
- Agreement on Trade-Related Aspects of Intellectual Property Rights, April 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 (1994). [https://www.wto.org/english/docs\\_e/legal\\_e/27-trips\\_01\\_e.htm](https://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm).

- AllAfrica. "Ethiopia: Raising Guard on Substandard, Counterfeit Drugs." April 17, 2018. <https://allafrica.com/stories/201804180244.html>.
- Allard, Céline, Jorge Iván Canales Kriljenko, Wenjie Chen, Jesus Gonzalez-Garcia, Emmanouil Kitsios, and Juan Treviño. "Trade Integration and Global Value Chains in Sub-Saharan Africa: In Pursuit of the Missing Link." International Monetary Fund, 2016. <https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2016/12/31/Trade-Integration-and-Global-Value-Chains-in-Sub-Saharan-Africa-In-Pursuit-of-the-Missing-43673>.
- Addis Fortune. "Intercontinental to Face-Off in Court Again." October 18, 2016. <https://addisfortune.net/articles/intercontinentals-to-face-off-in-court-again/>.
- Adegoke, Jimmy, Pramod Aggarwal, Mark Rüegg, James Hansen, Daniella Cuellar, Rahel Diro, Rebecca Shaw, Jon Hellin, Helen Greatrex, and Robert Zougmore. *Improving Climate Risk Transfer and Management for Climate-Smart Agriculture: A Review of Existing Examples of Successful Index-Based Insurance for Scaling Up*. Review: Index-Based Insurance for Climate-Smart Agriculture, Global Alliance for Climate-Smart Agriculture, Food and Agriculture Organization of the United Nations, October 2017. <http://www.fao.org/3/a-bu216e.pdf>.
- Adegoke, Yinka. "Africa Will Have Some of the World's Fastest-Growing Economies in 2019—and a Looming Debt Crisis." January 13, 2019. <https://qz.com/africa/1522126/african-economies-to-watch-in-2019-and-looming-debt/>.
- Adeyera, Damilola. "Undercover: With Just N70, You Can Buy a Pirated Copy of Genevieve's 'Lionheart.'" *Sahara Reporters*, January 30, 2019. <http://saharareporters.com/2019/01/30/undercover-just-n70-you-can-buy-pirated-copy-genevieves-lionheart>.
- Addison, Velda. "Subsea Tieback Potential Grows as Priorities Shift." *Subsea Engineering News*, August 12, 2016. <https://www.hartenergy.com/exclusives/subsea-tieback-potential-grows-priorities-shift-29027>.
- Addo, Sylvester. "Microsoft's Africa Datacenters Go Live in South Africa." Microsoft Care GH, March 6, 2019. <http://microsoftcaregh.com/2019/03/06/microsofts-africa-datacenters-go-live-in-south-africa/>.
- Africa Business Insight. "Venture Capital Investors Making Big Bets on African Fintech." October 19, 2018. <https://www.howwemadeitinafrica.com/venture-capital-investors-making-big-bets-on-african-fintech/62334/>.
- African Aerospace. "There's No Place Like Lomé. . . ." September 13, 2016. <https://www.africanaerospace.aero/there-s-no-place-like-lom-.html>.
- African Development Bank (AfDB). *African Economic Outlook 2018*, 2018. [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African\\_Economic\\_Outlook\\_2018\\_-\\_EN.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African_Economic_Outlook_2018_-_EN.pdf).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- African Development Bank (AfDB). *Africa Tourism Monitor: Unlocking Africa's Tourism Potential* 3, no. 1 (October 2015). <https://www.afdb.org/en/documents/document/africa-tourism-monitor-2015-unlocking-africas-tourism-potential-85195>.
- African Development Bank (AfDB). "Programme for Infrastructure Development in Africa (PIDA)." <https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/programme-for-infrastructure-development-in-africa-pida> (accessed various dates).
- African Development Bank (AfDB), Organisation for Economic Co-operation and Development (OECD), and United Nations Development Programme (UNDP). *African Economic Outlook 2014: Global Value Chains and Africa's Industrialization*, 2014. [https://www.oecd-ilibrary.org/african-economic-outlook-2014\\_5jz79k5kh9r1.pdf?itemId=%2Fcontent%2Fpublication%2Faeo-2014-en&mimeType=pdf](https://www.oecd-ilibrary.org/african-economic-outlook-2014_5jz79k5kh9r1.pdf?itemId=%2Fcontent%2Fpublication%2Faeo-2014-en&mimeType=pdf).
- African Energy. "Ghana: Construction Under Way at Bridge Power." December 13, 2018. <https://www.africa-energy.com/live-data/article/ghana-construction-under-way-bridge-power>.
- African Payment Solutions. "The African E-commerce, and E-commerce Payments Market—The Next Five Years." August 30, 2019. <https://africanpaymentsolutions.com/2019/08/30/the-african-ecommerce-and-ecommerce-payments-market-is-developing-over-the-next-five-years/>.
- African Regional Intellectual Property Organization (ARIPO). "What Is a Patent?" <https://www.aripo.org/ip-services/patents/> (accessed January 21, 2020).
- African Regional Intellectual Property Organization (ARIPO). "What Is a Trademark?" <https://www.aripo.org/ip-services/trademarks/> (accessed January 21, 2020).
- African Trade Ministers. *AGOA Forum 2019: Recommendations from Ministerial Consultative Meeting*. AGOA.info, August 5, 2019. <https://agoa.info/images/documents/15643/recommendations-from-2019-agoa-ministerial-consultative-meeting.pdf>.
- African Union (AU). Agreement Establishing the African Continental Free Trade Area, May 30, 2019. <https://au.int/en/treaties/agreement-establishing-african-continental-free-trade-area>.
- African Union (AU). "CEN SAD." <https://au.int/en/recs/censad> (accessed September 30, 2019).
- African Union (AU). "CFTA—Continental Free Trade Area." <https://au.int/en/ti/cfta/about> (accessed October 18, 2019).
- African Union (AU). "Decision on the Moratorium on the Recognition of Regional Economic Communities (RECs)." Doc Ex.Cl/278 (IX), Assembly of the African Union, Seventh Ordinary Session, Banjul, The Gambia, July 1–2, 2006. [https://au.int/sites/default/files/decisions/9555-assembly\\_au\\_dec\\_111-133\\_vii\\_e.pdf](https://au.int/sites/default/files/decisions/9555-assembly_au_dec_111-133_vii_e.pdf).
- African Union (AU). "Economic Community of Central African States (ECCAS)." <https://au.int/en/recs/eccas> (accessed September 30, 2019).

- African Union (AU). "Indication of Legal Instruments Signed at the 10th Extraordinary Session of the Assembly on the Launch of AfCFTA." March 21, 2018. <https://au.int/sites/default/files/pressreleases/34033-pr-indication20of20signing20authority20-20updated20final20final20docx.pdf>.
- African Union (AU). "List of Countries That Signed the Establishment of the African Continental Free Trade Area (AfCFTA) at the 10th Extraordinary Session of the Assembly on the Launch of AfCFTA." Press release, October 8, 2019. <https://au.int/en/pressreleases/20180321/list-african-countries-signed-establishment-african-continental-free-trade>.
- African Union (AU). "Member States." [https://au.int/en/member\\_states/countryprofiles2](https://au.int/en/member_states/countryprofiles2) (accessed February 5, 2020).
- African Union (AU). Organization of African Unity—Treaty Establishing the African Economic Community, June 3, 1991. <https://au.int/en/treaties/treaty-establishing-african-economic-community> and [https://au.int/sites/default/files/treaties/7775-treaty-0016\\_-\\_treaty\\_establishing\\_the\\_african\\_economic\\_community\\_e.pdf](https://au.int/sites/default/files/treaties/7775-treaty-0016_-_treaty_establishing_the_african_economic_community_e.pdf).
- African Union (AU). "Regional Economic Communities (RECs)." <https://au.int/en/organs/recs> (accessed April 13, 2018).
- African Union (AU). *Report on the African Continental Free Trade Area*, by H.E. Mahamadou Issoufou, President of the Republic of Niger, February 10–11, 2019. <https://archives.au.int/handle/123456789/6542>.
- African Union (AU). "Status List." <https://au.int/sites/default/files/treaties/32549-sl-add%28PAIPO%29%20%281%29.pdf> (accessed January 21, 2020).
- African Union Commission (AUC). "Status of Integration in Africa (SIA) IV." 2013. [https://au.int/sites/default/files/newsevents/workingdocuments/26630-wd-highlights\\_rev1\\_en.pdf](https://au.int/sites/default/files/newsevents/workingdocuments/26630-wd-highlights_rev1_en.pdf).
- African Union Commission (AUC). "Status of Integration in Africa (SIA) V." August 29, 2017. <https://au.int/sites/default/files/documents/32854-doc-status-of-integration-in-afriva-v.pdf>.
- African Union Commission (AUC), African Development Bank (AfDB), and United Nations Economic Commission for Africa (UNECA). *Africa Regional Integration Index Report 2016*, 2016. [https://www.integrate-africa.org/fileadmin/uploads/afdb/Documents/ARII-Report2016\\_EN\\_web.pdf](https://www.integrate-africa.org/fileadmin/uploads/afdb/Documents/ARII-Report2016_EN_web.pdf).
- African Union Commission (AUC), United Nations Economic Commission for Africa (UNECA), and Africa Trade Policy Centre (ATPC). *Guidelines on Developing a National AGOA Strategy*, June 15, 2012. <https://agoa.info/images/documents/6188/guidelines-for-national-agoa-response-strategy-auuneca.pdf>.
- Africa Oil & Power. "ExxonMobil to Run Its Largest 3D Seismic Campaign in the MSGBC Basin." <https://africaoilandpower.com/2018/12/12/exxonmobil-to-run-its-largest-3d-seismic-campaign-ever-in-the-msgbc-basin/> (accessed October 21, 2019).

Afrobarometer. The Online Data Analysis Tool. “R7 2016/2018—Mobile Phone Has Access to Internet?” <https://afrobarometer.org/online-data-analysis/analyse-online> (accessed November 19, 2019).

Afrobarometer. The Online Data Analysis Tool. “R7 2016/2018—Own Computer?” <https://afrobarometer.org/online-data-analysis/analyse-online> (accessed November 19, 2019).

After Access. “Let the People Speak: using evidence from the Global South to reshape our digital future.” 2017. Presentation at the IGF 2017 Panel, Geneva, Switzerland. [https://researchictafrica.net/wp/wp-content/uploads/2018/01/AfterAccess\\_IGF2017-1-2.pdf](https://researchictafrica.net/wp/wp-content/uploads/2018/01/AfterAccess_IGF2017-1-2.pdf).

Agade, Halligan. “Africa Urged to Leverage on Digital Technologies.” CGTN Africa, July 16, 2019. <https://africa.cgtn.com/2019/07/16/africa-urged-to-leverage-on-digital-technologies-to-spur-digital-economies/>.

Agence France-Presse (AFP). “Nigeria’s Nollywood Film Industry Reels in Foreign Investors.” *France 24*, July 7, 2019. <https://www.france24.com/en/20190707-nigerias-nollywood-film-industry-reels-foreign-investors>.

AgFunder. *AgFunder AgriFood Tech Investing Report—2018*, 2019. <https://agfunder.com/research/agrifood-tech-investing-report-2018/> (registration required).

AGOA.info. “National AGOA Strategies.” Tralac. <https://agoa.info/downloads/national-strategies.html> (accessed October 21, 2019).

AGOA.info. “Reviving Nigeria’s Ailing Textile Industry.” Tralac, February 17, 2013. <https://agoa.info/news/article/5065-reviving-nigeria-ailing-textile-industry.html>.

AGRA. See Alliance for a Green Revolution in Africa (AGRA).

Agriculture and Climate Risk Enterprise (ACRE) Africa. “Our Achievements.” [www.acreafrica.com/achievements/](http://www.acreafrica.com/achievements/) (accessed October 15, 2019).

Agri Logic. *Value Chain Analysis for the Coffee Sector in Rwanda*. Prepared for the CBI (Centre for the Promotion of Imports from developing countries), July 27, 2018. [https://www.cbi.eu/sites/default/files/cbi\\_vca\\_rwanda\\_coffee.pdf](https://www.cbi.eu/sites/default/files/cbi_vca_rwanda_coffee.pdf).

AgroPages. “Nigeria Launches New Varieties of Bt Cotton—Agricultural News.” November 29, 2018. <http://news.agropages.com/News/NewsDetail---28555.htm>.

AgTech Insight. *AgTech Market Map*, 2016. <https://www.cbinsights.com/research/agriculture-tech-market-map-company-list/>.

Ahmed, Shukkri, Craig McIntosh, and Alexandros Sarris. “The Impact of Commercial Rainfall Index Insurance: Experimental Evidence from Ethiopia.” Fondation pour les Etudes et Recherches sur le Développement International (FERDI) (Foundation for Studies and Research on International Development) (France) Working Paper 4289, 2017. <https://ideas.repec.org/p/fdi/wpaper/4289.html#download>.

- Airbus. *Global Market Forecast: Global Networks, Global Citizens, 2018–2037*, 2018. <https://www.airbus.com/content/dam/corporate-topics/publications/media-day/GMF-2018-2037.pdf>.
- Airlinerwatch*. “Air Tanzania Receives Its First and Only Dreamliner.” July 9, 2018. <https://airlinerwatch.com/air-tanzania-receives-its-first-and-only-dreamliner/>.
- Airport Technology. “Mapping Africa’s Biggest Airport Projects.” July 23, 2018. <https://www.airport-technology.com/features/africas-airport-projects/>.
- Akamai. “Media Delivery Network Map.” <https://www.akamai.com/us/en/resources/visualizing-akamai/media-delivery-map.jsp> (accessed August 14, 2019).
- Akande, Segun, and Daryl Brown. “Moving Nigerian Filmmaking beyond Nollywood.” *CNN*, October 2, 2018. <https://www.cnn.com/2018/10/02/africa/nigeria-nollywood-international/index.html>.
- Akwagyiram, Alexis, and Chijioke Ohuocha. “Nigeria Tariff Causes Car Imports to Fall, Fuels Smuggling—Port Authority.” *Reuters*, December 15, 2017. <https://www.reuters.com/article/nigeria-autos/nigeria-tariff-causes-car-imports-to-fall-fuels-smuggling-ports-authority-idUSL8N1O06GX>.
- Akwei, Ishmail. “Submarine cable deployed in Angola to link Africa to South America.” *Africanews.com*, August 10, 2017. <https://www.africanews.com/2017/08/10/submarine-cable-deployed-in-angola-to-link-africa-to-south-america/>.
- Al Jazeera. “Ethiopian Airlines: Africa’s Largest Air Carrier.” March 10, 2019. <https://www.aljazeera.com/news/2019/03/ethiopian-airline-profile-africa-largest-air-carrier-190310155418096.html>.
- Alade, Benjamin. “Nigeria: Ford Assembly Plant Berths in Lagos, to Produce 20,000 Vehicles Yearly.” *Guardian*, October 20, 2017. <https://allafrica.com/stories/201710200685.html>.
- Alaudeen, Aisha. “Ethiopia’s Garment Workers Make Clothes for Some of the World’s Largest Clothing Brands but Get Paid the Lowest.” *CNN. Marketplace Africa*, May 13, 2019. <https://www.cnn.com/2019/05/11/africa/ethiopia-garment-workers-lowest-paid-intl/index.html>.
- Alberda, Jogchum, and Rachele Janssen. “How We Used Blockchain to Make Supply Chains Transparent and Traceable.” *Accenture Insights*, 2018. <https://www.accenture-insights.nl/en-us/articles/improving-physical-supply-chains-with-blockchain>.
- Alberda, Jogchum, and Rachele Janssen. “*Improving Physical Supply Chains with Blockchain | Accenture Insights*.” 2018. <https://www.accenture-insights.nl/en-us/articles/improving-physical-supply-chains-with-blockchain>.
- Alfaro, Laura, Areendam Chanda, Sebnem Kalemli-Ozcan, and Selin Sayek. “FDI and Economic Growth: The Role of Local Financial Markets.” *Journal of International Economics* 64, no. 1 (2004): 89–112. <https://www.sciencedirect.com/science/article/pii/S0022199603000813>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Alfonso, Allyson. "South African Tourism Launches 'Choose Your Adventure' Campaign." Bandt (Australia), March 28, 2019. <https://www.bandt.com.au/campaigns/south-african-tourism-launches-choose-adventure-campaign>.
- Alliance for a Green Revolution in Africa (AGRA). *Africa Agriculture Status Report 2017: The Business of Smallholder Agriculture in Sub-Saharan Africa*, Issue 5 (2017). <https://agra.org/wp-content/uploads/2017/09/Final-AASR-2017-Aug-28.pdf>.
- Alliance for a Green Revolution in Africa (AGRA). *Africa Agriculture Status Report 2018: Catalyzing Government Capacity to Drive Agricultural Transformation*, Issue 6 (2018). <https://agra.org/wp-content/uploads/2018/10/AASR-2018.pdf>.
- Alliance for a Green Revolution in Africa (AGRA). *Africa Agriculture Status Report 2019: The Hidden Middle; A Quiet Revolution in the Private Sector Driving Agricultural Transformation*, Issue 7 (2019). <https://agra.org/wp-content/uploads/2019/09/AASR2019-The-Hidden-Middleweb.pdf>.
- Aluminum Recyclers Council. "Aluminum Scrap Booming Thanks to Tariffs." News release, January 16, 2019. <https://www.recyclealuminum.org/aluminum-scrap-booming-thanks-to-tariffs>.
- Amazon Web Services (AWS). "AWS Africa." <https://aws.amazon.com/local/africa/> (accessed March 10, 2020).
- American Fuel & Petrochemical Manufacturers (AFPM). "Petrochemicals." <https://www.afpm.org/industries/products/petrochemicals> (accessed October 21, 2019).
- American Iron and Steel Institute (AISI). "AISI Releases 2018 Annual Statistical Report." News release, July 29, 2019. <https://www.steel.org/news/2019/07/aisi-releases-2018-annual-statistical-report>.
- American Iron and Steel Institute (AISI). "July Steel Shipments Up 5.1 Percent from Prior Month." September 9, 2019. <https://www.steel.org/news/2019/09/july-steel-shipments-up-5-point-1-percent-from-prior-month>.
- American Iron and Steel Institute (AISI). "Profile 2017." May 3, 2017. <https://www.steel.org/~media/Files/AISI/Reports/2017-AISI-Profile-Book.pdf>.
- American Iron and Steel Institute (AISI). "Steel Mill Capacity Utilization Rate." January 2018 and December 2018. <https://www.steel.org/industry-data>.
- Amey, Earle B. "Gold." *Mineral Commodity Summaries* (various years). Reston, VA: U.S. Geological Survey, January 1998 to January 2005. <https://www.usgs.gov/centers/nmic/gold-statistics-and-information>.
- Amir, Anna. "Chocolate Production in the US." IBISWorld, 2017. [www.ibisworld.com](http://www.ibisworld.com) (subscription required).
- Amos, Ikwap. "With 7 Out of 10 Residents Living in Remote Rural Areas, Madagascar Is Counting on Drones to Deliver Medical Care." *iAfrikan* (South Africa), October 31, 2016. <https://www.iafrikan.com/2016/10/31/with-7-out-of-10-residents-living-in-remote-rural-areas-madagascar-is-counting-on-drones-to-deliver-much-needed-medical-care/>.

- Anadarko Petroleum Corporation. "Anadarko Reaches Significant Mozambique LNG Milestone." Press release, July 31, 2017. [http://www.mzlng.com/content/documents/MZLNG/publications/News/APC\\_Mozambique\\_Milestone\\_7-31-17.pdf](http://www.mzlng.com/content/documents/MZLNG/publications/News/APC_Mozambique_Milestone_7-31-17.pdf).
- Andrenelli, Andrea, Iza Lejárraga, Sébastien Miroudot, and Letizia Montinari. "Micro-Evidence on Corporate Relationships in Global Value Chains: The Role of Trade, FDI and Strategic Partnerships." Organisation for Economic Co-operation and Development (OECD), April 25, 2019. [http://shp2.amsab.be/Record/19307635124911258179\\_1621714a8f0d4e4fb45ff81e7b96d118](http://shp2.amsab.be/Record/19307635124911258179_1621714a8f0d4e4fb45ff81e7b96d118).
- Anganan, Villen. "Mauritius and Madagascar Boost Garment Manufacturing Ties." Just-Style, September 18, 2019. [https://www.just-style.com/analysis/mauritius-and-madagascar-boost-garment-manufacturing-ties\\_id137028.aspx](https://www.just-style.com/analysis/mauritius-and-madagascar-boost-garment-manufacturing-ties_id137028.aspx).
- Anheuser-Busch. "US Fact Sheet." August 16, 2018. [https://www.anheuser-busch.com/content/dam/universaltemplate/ab/about/us-fact-sheet-pdf/AB%20Infographic\\_081618\\_8.5x11v1.pdf](https://www.anheuser-busch.com/content/dam/universaltemplate/ab/about/us-fact-sheet-pdf/AB%20Infographic_081618_8.5x11v1.pdf).
- Antwerp World Diamond Centre (AWDC) and Bain & Co. (Bain). *The Global Diamond Report 2018*. Antwerp, Belgium: AWDC, December 2018. [https://www.awdc.be/sites/awdc2016/files/bain\\_diamond\\_report\\_2018.pdf](https://www.awdc.be/sites/awdc2016/files/bain_diamond_report_2018.pdf).
- Arab Maghreb Union (UMA). "L'Union du Maghreb Arabe." [http://www.umaghrebarabe.org/?q=fr/Union\\_du\\_Maghreb\\_Arabe](http://www.umaghrebarabe.org/?q=fr/Union_du_Maghreb_Arabe) (accessed September 30, 2019).
- Arab Maghreb Union (AMU). "Member States." <http://www.maghrebarabe.org/en/> (accessed February 5, 2020).
- Argus Media. "Interview with Renzo Bee (Global LPG Partnership)." For the Argus West Africa LPG conference May 9–10, 2018, Accra, Ghana, February 2018. <http://glpgp.org/s/Argus-Interview-with-Renzo-Bee-GLPGP-Future-of-West-African-LPG-February-2018.pdf>.
- Argus Media. "Nigeria's NNPC Ends Cash-Call Agreements with IOCs." News release, December 16, 2016. <https://www.argusmedia.com/pt/news/1370103-nigerias-nnpc-ends-cashcall-agreements-with-iocs?amp=1>.
- Arnold, Tom. "Citigroup Targets Rapid Middle East, Africa Growth in 2018." Reuters, February 7, 2018. <https://uk.reuters.com/article/us-citigroup-mideast-growth/citigroup-targets-rapid-middle-east-africa-growth-in-2018-idUKKBN1FR2YU>.
- Arrington, Woodrow. "Amazon CloudFront Announces New Edge Locations in Johannesburg and Bangalore." Press release, June 14, 2018. <https://aws.amazon.com/blogs/networking-and-content-delivery/amazon-cloudfront-announces-new-edge-locations-in-johannesburg-and-bangalore/>.

Article 19. "Ethiopia: Computer Crime Proclamation." July 9, 2016.

[https://www.article19.org/data/files/medialibrary/38450/Ethiopia-Computer-Crime-Proclamation-Legal-Analysis-July-\(1\).pdf](https://www.article19.org/data/files/medialibrary/38450/Ethiopia-Computer-Crime-Proclamation-Legal-Analysis-July-(1).pdf).

Article 19. "Kenya: Computer and Cybercrimes Bill 2017." April 12, 2018. <https://www.article19.org/wp-content/uploads/2018/04/Kenya-analysis-April-2018.pdf>.

Article 19. "Rwanda: Law Governing Information and Communication Technologies." May 18, 2018. <https://www.article19.org/wp-content/uploads/2018/05/Analysis-Rwanda-ICT-Law-April-2018.pdf>.

Asepex and Government of Senegal, Ministry of Commerce, Entrepreneurship and the Informal Sector. *Stratégie de Développement des Exportations Sénégalaises sous AGOA* (Strategy for developing Senegalese exports under AGOA), February 2, 2015.

<https://agoa.info/images/documents/6087/senegal-asepex-draft-strategie-agoafinal-3.pdf>.

Ashimwe, Edwin. "Inside Zipline's New Distribution Centre." *New Times* (Rwanda), March 19, 2019.

<https://www.newtimes.co.rw/news/inside-ziplines-new-distribution-centre>.

Ashreena, Tanya. "Chromium Prices Jump 25% on Severe Supply Shortage." *Metal Bulletin*, April 10, 2018. <https://www.metalbulletin.com/Article/3799648/Chromium-prices-jump-25-on-severe-supply-shortage.html>.

Asiedu, Kwasi Gyamfi. "An Ambitious Drone Delivery Health Service in Ghana Is Tackling Key Logistics Challenges." *Quartz Africa*, April 25, 2019. <https://qz.com/africa/1604374/ziplines-drone-delivery-launches-in-ghana-with-vaccines>.

Asmal, Zaakhir, Belya Begashaw, Haroon Bhorat, Brahim S. Coulibaly, Kemal Dervis, Simeon K. Ehui, Hafez Ghanem, et al. *Foresight Africa 2020*. Brookings Institution, January 8, 2020.

<https://www.brookings.edu/multi-chapter-report/foresight-africa-top-priorities-for-the-continent-in-2020/>.

Assefa, Shimelis, Daniel Gelaw Alemneh, and Abebe Rorissa. "Diffusion of Scientific Knowledge in Agriculture: The Case for Africa." *Agricultural Information Worldwide* 6 (2014): 34–47.

<https://digital.library.unt.edu/ark:/67531/metadc499086/>.

Associated Press. "The Life-Saving Potential of Drones in Africa." *CBS News*, October 10, 2016.

<https://www.cbsnews.com/news/drones-carrying-medicine-blood-face-challenge-in-africa/>.

Associated Press. "Will Facebook's Libra Become the Go-To Payment System Where Banks Fall Short?" *Fortune*, June 28, 2019. <https://fortune.com/2019/06/28/facebook-libra-developing-world-india-africa/>.

Atabong, Amindeh Blaise. "Jumia's Cameroon Exit Could Be the First Step to Shrinking Its Beleaguered E-commerce Business." *Quartz*, November 19, 2019. [https://qz.com/africa/1751659/jumia-shuts-down-in-cameroon-as-african-e-commerce-struggles/?utm\\_source=email&utm\\_medium=africa-weekly-brief](https://qz.com/africa/1751659/jumia-shuts-down-in-cameroon-as-african-e-commerce-struggles/?utm_source=email&utm_medium=africa-weekly-brief).

- Attwell, William. "3 Things Multinationals Don't Understand about Africa's Middle Class." *Harvard Business Review*, April 18, 2017. <https://hbr.org/2017/08/3-things-multinationals-dont-understand-about-africas-middle-class>.
- Australian Macadamias. "8 Reasons Future Looks Bright for Aussie Macadamia Industry: 2016 Conference Insights." News release, November 22, 2016. <https://www.australian-macadamias.org/trade/news-and-reports/news/8-reasons-future-looks-bright-for-aussie-macadamia-industry>.
- Australian Macadamias. "Trials Prove Macadamias' Potential for Surging Dairy Alternatives Market." News release, July 17, 2019. <https://www.australian-macadamias.org/trade/news-and-reports/news/trials-prove-macadamias-potential-for-surging-dairy-alternatives-market>.
- Automotive Industry Development Center (AIDC). "AIDC in Partnership with Ford Announce the First Automotive Incubation Centre Graduate." Press release, September 3, 2015. [https://www.engineeringnews.co.za/attachment.php?aa\\_id=56512](https://www.engineeringnews.co.za/attachment.php?aa_id=56512).
- Automotive Industry Development Center (AIDC). "Incubation Programmes." <http://www.aidc.co.za/incubation-programmes/> (accessed September 10, 2019).
- Automotive World. "Engine Plant Database—2019 Edition." May 23, 2019. <https://www.automotiveworld.com/research/global-vehicle-engine-plant-database-2019-edition>.
- Awogbade, Soji, Kofoworola Bamgobse, and Otasowie Izeor. "Oil and Gas Regulation in Nigeria: Overview." Thompson Reuters Practical Law (UK), May 1, 2017. [https://uk.practicallaw.thomsonreuters.com/5-523-4794?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&bhcp=1](https://uk.practicallaw.thomsonreuters.com/5-523-4794?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1).
- Aydemir, Gamze. "Titanium Carbide Powders and Applications." November 20, 2018. <https://nanografi.com/blog/titanium-carbide-powders-and-applications/>.
- Aylward, Shona. "South Africa Regains Crown as World's Largest Producer of Macadamia Nuts." *South Coast Herald* (South Africa), May 30, 2018. <https://southcoastherald.co.za/289434/south-africa-regains-crown-worlds-largest-producer-macadamia-nuts/>.
- Babatope, Oluwole. "Democratization of Content and Its Effect on Pay TV." International Data Corporation (IDC), November 2018. <https://www.idc.com/getdoc.jsp?containerId=CEMA43444718>.
- Bacchi, Umberto. "Can Africa Deal with an Expected Boom in Demand for Meat?" Reuters, March 13, 2017. <https://www.reuters.com/article/us-africa-food-livestock/can-africa-deal-with-an-expected-boom-in-demand-for-meat-idUSKBN16K1V3>.
- Balie, Jean, Davide Del Prete, Emiliano Magrini, Pierluigi Montalbano, and Silvia Nenci. "Agriculture and Food Global Value Chains in Sub-Saharan Africa: Does Bilateral Trade Policy Impact on Backward and Forward Participation?" Sapienza University of Rome, Dipartimento di Scienze Sociali ed Economiche (Department of Social Sciences and Economics). Working Papers Series no. 4, April 2017. <https://ideas.repec.org/p/sag/wpaper/4-17.html>.

Baker, Maria. "How Blockchain and Technology Are Digitizing the First Mile." *FreightWaves*, 2018.

<https://www.freightwaves.com/news/how-blockchain-and-technology-are-digitizing-the-first-mile>.

Bamber, Penny, Karina Fernandez-Stark, Gary Gereffi, and Andrew Guinn. *Connecting Local Producers in Developing Countries to Regional and Global Value Chains: Update*. Organisation for Economic Co-operation and Development (OECD). Working Party of the Trade Committee. OECD Trade Policy Paper No. 160, December 3, 2013.

[http://search.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP\(2013\)27/FINAL&docLanguage=En](http://search.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP(2013)27/FINAL&docLanguage=En).

Band, Jonathan. "Cautionary Takes about Collective Rights Organizations, Part 2." *Infojustice.org* (blog). American University, Program on Information Justice and Intellectual Property, May 22, 2018.

<http://infojustice.org/archives/39886>.

Banga, Rashmi. *Growing Trade in Electronic Transmissions: Implications for the South*. United Nations Conference on Trade and Development (UNCTAD) Research Paper no. 29, 2019.

[https://unctad.org/en/PublicationsLibrary/ser-rp-2019d1\\_en.pdf](https://unctad.org/en/PublicationsLibrary/ser-rp-2019d1_en.pdf).

Bannister, Frank, and Regina Connolly. "Defining e-Governance." *e-Service Journal* 8, no. 2 (2012): 3–25.

[https://www.researchgate.net/profile/Regina\\_Connolly/publication/259733772\\_Defining\\_e-Governance/links/5b82b3fda6fdcc5f8b69528b/Defining-e-Governance.pdf](https://www.researchgate.net/profile/Regina_Connolly/publication/259733772_Defining_e-Governance/links/5b82b3fda6fdcc5f8b69528b/Defining-e-Governance.pdf).

Banwo & Ighodalo. "Strengthening Intellectual Property Rights and Protection in Nigeria." *Grey Matter*, September 16, 2016.

<https://www.banwo-ighodalo.com/grey-matter/strengthening-intellectual-property-rights-and-protection-in-nigeria>.

Baran, Michelle. "Finally, Nonstop Flights from United States to Cape Town Are Coming." *AFAR*

magazine, April 16, 2019. <https://www.afar.com/magazine/finally-nonstop-flights-from-united-states-to-cape-town-are-coming>.

Barnhart, Christine, and Michael Edgett. "Supply Chain Management: What's Next for Food and Beverage?" *Webinar, Event from Infor Food Engineering*, November 14, 2019.

<https://www.foodengineeringmag.com/events/2576-supply-chain-management-what-s-next-for-food-and-beverage>.

Barrie, Leonie. "PVH Wins Award for Sustainable Operations in Ethiopia." *Just-style*, September 13,

2018. [https://www.just-style.com/news/pvh-wins-award-for-sustainable-operations-in-ethiopia\\_id134468.aspx](https://www.just-style.com/news/pvh-wins-award-for-sustainable-operations-in-ethiopia_id134468.aspx).

Barry Callebaut. "Empowering Cocoa Farmers: Barry Callebaut's Commitment to a Sustainable Cocoa Industry in Ivory Coast." January 2019.

[https://www.barry-callebaut.com/sites/default/files/2019-01/ar07\\_cabosse\\_e\\_final.pdf](https://www.barry-callebaut.com/sites/default/files/2019-01/ar07_cabosse_e_final.pdf).

Battery University. "Is Li-ion the Solution for the Electric Vehicle?"

[https://batteryuniversity.com/learn/archive/is\\_li\\_ion\\_the\\_solution\\_for\\_the\\_electric\\_vehicle](https://batteryuniversity.com/learn/archive/is_li_ion_the_solution_for_the_electric_vehicle) (accessed September 19, 2019).

- Battery University. "The High-Power Lithium-ion." [https://batteryuniversity.com/learn/archive/the\\_high\\_power\\_lithium\\_ion](https://batteryuniversity.com/learn/archive/the_high_power_lithium_ion) (accessed September 19, 2019).
- Bayer, Yilmaz, and Marius Dan Gavriletea. "Foreign Direct Investment Inflows and Financial Development in Central and Eastern European Union Countries: A Panel Cointegration and Causality." *International Journal of Financial Studies* 6, no. 2 (2018): 1-13. <https://www.mdpi.com/2227-7072/6/2/55/pdf>.
- BBC. "Making a Fortune by Distributing Nigerian Films Online." May 7, 2012. <https://www.bbc.com/news/world-africa-17896461>.
- BBC. "SAA 'Should Be Shut Down,' Says Finance Minister Tito Mboweni." BBC News, November 2, 2018. <https://www.bbc.com/news/world-africa-46070949>.
- BBC. "Using Smart Parking to Ease Congestion in Addis Ababa." Video, November 18, 2019. <https://www.bbc.com/news/av/business-50466980/using-smart-parking-to-ease-congestion-in-addis-ababa>.
- BCG. "How Online Marketplaces Can Power Employment in Africa." March 26, 2019. <https://www.bcg.com/publications/2019/how-online-marketplaces-can-power-employment-africa.aspx>.
- Beckman, Jeremy. "Sub-Saharan Africa Opening Up to Offshore Investors." *Offshore*, April 1, 2019. <https://www.offshore-mag.com/drilling-completion/article/16763971/subsaharan-africa-opening-up-to-offshore-investors>.
- Bell, Sarah Jane. "Macadamia Nuts Double in Price as Growers Struggle to Keep Up with Demand." ABC News Australia, March 10, 2019. <https://www.abc.net.au/news/2019-03-11/health-food-trends-drive-surge-in-macadamia-price/10886728>.
- Bell, Terrence. "Cobalt Metal: Properties, Production, and Application." *The Balance*, March 28, 2018. <https://www.thebalance.com/metal-profile-cobalt-2340131>.
- Ben Barka, Habiba. *Border Posts, Checkpoints, and Intra-African Trade: Challenges and Solutions*. African Development Bank Group (AfDB) Chief Economist Complex, January 2012. [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/INTRA%20AFRICAN%20TRADE\\_INTRA%20AFRICAN%20TRADE.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/INTRA%20AFRICAN%20TRADE_INTRA%20AFRICAN%20TRADE.pdf).
- Ben-Huthta, Avi. "Africa RE to Develop Agricultural Insurance in Nigeria." *Coverager*, April 2, 2019. <https://coverager.com/africa-re-and-ifc-to-develop-agricultural-insurance-market-in-nigeria/>.
- Benton, Dale. "AB InBev: Brewing Up Economic Growth in Africa." *Supply Chain Digital Magazine*, December 15, 2017. <https://www.supplychaindigital.com/company/ab-inbev-brewing-economic-growth-africa>.
- Beverage Daily. "Africa: The Fastest Growing Beer Market." January 12, 2016. <https://www.beveragedaily.com/Article/2016/01/12/Africa-The-fastest-growing-beer-market>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Bhorat, Haroon. "Inequality in Africa: Implications for the Sustainable Development Goals." *Africa in Focus* (blog). Brookings, September 22, 2015. <https://www.brookings.edu/blog/africa-in-focus/2015/09/22/inequality-in-africa-implications-for-the-sustainable-development-goals/>.

Bigoni, Michele. "The Union of the Arab Maghreb and Regional Integration: Challenges and Prospects." *EP Think Tank* (blog), European Parliamentary Research Service, January 16, 2014. <https://epthinktank.eu/2014/01/16/the-union-of-the-arab-maghreb-and-regional-integration-challenges-and-prospects/>.

Biology Online Dictionary. "Crossbreeding Definition and Examples." n.d. <https://www.biology-online.org/dictionary/Crossbreeding> (accessed November 12, 2019).

Birch, Izzy. *Agricultural Productivity in Kenya: Barriers and Opportunities*. Knowledge 4 Development Helpdesk Report, 2018. [https://assets.publishing.service.gov.uk/media/5c70028ee5274a0ecbe9a1c2/483\\_Agricultural\\_Productivity\\_in\\_Kenya\\_Barriers\\_and\\_Opportunities.pdf](https://assets.publishing.service.gov.uk/media/5c70028ee5274a0ecbe9a1c2/483_Agricultural_Productivity_in_Kenya_Barriers_and_Opportunities.pdf).

Bird, Jane. "'Smart' Insurance Helps Poor Farmers to Cut Risk." *Financial Times*, December 4, 2018. <https://www.ft.com/content/3a8c7746-d886-11e8-aa22-36538487e3d0>.

Biresaw, Samue. "WTO Accession: The Possible Benefits for Ethiopia." *International Journal of Current Research* 10, Issue 11 (November 2018). <https://doi.org/10.24941/ijcr.33059.11.2018>.

Birguid (South Africa). "Executive Summary." *South Africa Craft Beer Market Analysis*, January 2019. <http://birguid.co.za/page/reports/>.

Bishumba, Nasra. "Rwanda Ratifies Tripartite Free Trade Area Agreement." *New Times* (Rwanda), July 11, 2019. <https://www.newtimes.co.rw/news/rwanda-ratifies-tripartite-free-trade-area-agreement>.

Black, Anthony, Brian Makundi, and Thomas McLennan. "Africa's Automotive Industry: Potential and Challenges." African Development Bank, Working Paper 282, September 2017. <https://www.afdb.org/en/documents/document/working-paper-282-africas-automotive-industry-potential-and-challenges-98157>.

Bleiwas, Donald I. *Estimates of Electricity Requirements for the Recovery of Mineral Commodities, with Examples Applied to Sub-Saharan Africa*. Reston, VA: U.S. Geological Survey (USGS), 2011. <https://pubs.usgs.gov/of/2011/1253/report/OF11-1253.pdf>.

Bloomberg. "Kai OS Technologies Inc." Company profile. <https://www.bloomberg.com/profile/company/1582021D:US> (accessed September 20, 2019).

BloombergNEF. *Offgrid Solar Market Trends Report 2016*, February 2016. [https://data.bloomberglp.com/bnef/sites/4/2016/03/20160303\\_BNEF\\_WorldBankIFC\\_Off-GridSolarReport.pdf](https://data.bloomberglp.com/bnef/sites/4/2016/03/20160303_BNEF_WorldBankIFC_Off-GridSolarReport.pdf).

Bloomberg News. "Jumia Raises \$196 Million for Its IPO." *Digital Commerce 360*, April 12, 2019. <https://www.digitalcommerce360.com/2019/04/12/jumia-raises-196-million-for-its-ipo/>.

- Board of Governors of the Federal Reserve System (Federal Reserve). “Historical Rates for the South African Rand.” Foreign Exchange Rates—H.10, released October 15, 2019. [https://www.federalreserve.gov/releases/h10/hist/dat00\\_sf.htm](https://www.federalreserve.gov/releases/h10/hist/dat00_sf.htm).
- Boeing. “787 Dreamliner to Become Part of Air Tanzania Fleet.” <https://www.boeing.com/commercial/customers/air-tanzania/air-tanzania-787-order.page> (accessed October 21, 2019).
- Boeing. “About Boeing Commercial Airplanes.” <https://www.boeing.com/company/about-bca/> (accessed October 21, 2019).
- Boeing. “Boeing in Africa.” [https://www.boeing.com/resources/boeingdotcom/company/key\\_orgs/boeing-international/pdf/africabackgrounder.pdf](https://www.boeing.com/resources/boeingdotcom/company/key_orgs/boeing-international/pdf/africabackgrounder.pdf) (accessed October 22, 2019).
- Boeing. “Boeing’s U.S. Footprint.” <https://www.boeing.com/company/general-info/> (accessed October 21, 2019).
- Boeing. *Commercial Market Outlook 2019–2038*, 2019. <https://www.boeing.com/resources/boeingdotcom/commercial/market/commercial-market-outlook/assets/downloads/cmo-2019-report-final.pdf>.
- Boeing. “Deliveries January 2016 through December 2018.” User-generated report. <http://www.boeing.com/commercial/#/orders-deliveries> (accessed October 22, 2019).
- Bold, Tessa. “Sub-standard Quality of Fertilisers and Hybrid Seeds Makes Adoption of Modern Inputs Unprofitable.” VOX Centre for Economic Policy Research (CEPR) Policy Portal, December 15, 2015. <https://voxeu.org/article/sub-Saharan-africa-s-low-adoption-high-tech-farm-inputs>.
- Booth, James. “Africa’s Untapped Potential as an E-commerce Market.” *Mobile Payments Today* (blog), July 16, 2019. <https://www.mobilepaymentstoday.com/blogs/africas-untapped-potential-as-an-ecommerce-market/>.
- Botes, Anton, Andrew Lane, and Hannah Edinger. “The New Frontier: Winning in the African Oil and Gas Industry.” Deloitte Insights, March 15, 2019. <https://www2.deloitte.com/us/en/insights/industry/oil-and-gas/africa-oil-gas-industry-energy-reserves.html>.
- Bowmans. “Fintech in Africa: Unpacking Risk and Regulation.” Fintech in Africa conference summary, 2017. <http://www.bowmanslaw.com/wp-content/uploads/2017/10/Fintech-In-Africa-Conference-Summary.pdf>.
- Bowmans. “Fintech Regulation in South Africa.” January 2, 2019. <https://www.lexology.com/library/detail.aspx?g=0f56605f-2ffc-4584-b19c-77d9944e9af6>.
- BP. “Oil: Refinery Throughput” and “Oil: Refining Capacity.” *Statistical Review of World Energy* (xlsx), June 2019. <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/downloads.html>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Brand South Africa (Hetzner). "Ford Secures Africa Export Contract." May 8, 2008. <https://www.brandsouthafrica.com/investments-immigration/business/trade/export/ford-080508>.
- Brandt, Edgar. "Walvis Bay's Peugeot Assembly Plant Gearing Up for Mass Production." *New Era Live*, February 4, 2019. <https://neweralive.na/posts/walvis-bays-peugeot-assembly-plant-gearing-up-for-mass-production>.
- Brewmistress, The. "Big Name Beer Imports to South Africa—Bonus or Burden?" July 30, 2019. <https://brewmistress.co.za/big-name-beer-imports-to-south-africa/>.
- Bridgeweb. "Zambia Set to Install 130 Modular Bridges." April 25, 2019. <https://www.bridgeweb.com/Zambia-set-to-install-130-modular-bridges/4958>.
- Bright, Jake. "Canal+ Acquires Nollywood Studio ROK from IROKOTv to Grow African Film." TechCrunch, July 15, 2019. <https://techcrunch.com/2019/07/15/canal-acquires-african-film-studio-rok-from-irokotv-to-grow-nollywood/>.
- Bright, Jake. "Drone Delivery Start-Up Zipline Launches UAV Medical Program in Ghana." TechCrunch. April 24, 2019. <https://techcrunch.com/2019/04/24/drone-delivery-startup-zipline-launches-uav-medical-program-in-ghana/?renderMode=ie11>.
- Bright, Jake. "Nollywood: The New Business of African Film." *This Is Africa*, May 2, 2014. <https://www.thisisafricaonline.com/Business/Nollywood-The-new-business-of-African-film>.
- Bright, Jake. "Pan-African E-tailer Jumia Grows 3Q Revenue, E-Payments and Losses." TechCrunch, November 12, 2019. <https://techcrunch.com/2019/11/12/pan-african-e-tailer-jumia-grows-3q-revenue-e-payments-and-losses/>.
- Bright, Jake. "WorldCover Raises \$6M Round for Emerging Markets' Climate Insurance." *Techcrunch*, May 3, 2019. <https://techcrunch.com/2019/05/03/worldcover-raises-6m-round-for-emerging-markets-climate-insurance/>.
- Briter Bridges. "Africa's Funding Landscape." 2019. <https://briter-bridges.typeform.com/to/Rke8Nj>.
- British Geological Survey. *World Mineral Production: 2013–2017*, 2019. <https://www.bgs.ac.uk/downloads/start.cfm?id=3512>.
- Brits, Marike. "World's Largest Macadamia Factory Opened in White River." BizCommunity, March 28, 2018. <https://www.bizcommunity.com/Article/196/358/175342.html>.
- Broadband TV News. "Global OTT Revenues to More Than Double." June 10, 2019. <https://www.broadbandtvnews.com/2019/06/10/global-ott-revenues-to-more-than-double/>.
- Brookes, Graham, and Peter Barfoot. *GM Crops: Global Socio-Economic and Environmental Impacts 1996–2016*. PG Economics, Ltd., report for Asociación de Biotecnología Vegetal Agrícola, Agro-Bio (Colombia), June 2018. <http://www.agrobio.org/wp-content/uploads/2016/03/globalimpactstudyfinalreportJune2018.pdf>.

- Browning, Noah. "Squeezed by U.S. Shale, Nigerian Oil Propped Up by Asian Demand." Reuters, April 8, 2019. <https://www.reuters.com/article/us-nigeria-oil/squeezed-by-u-s-shale-nigerian-oil-propped-up-by-asian-demand-idUSKCN1RK0GB>.
- Brown, Ryan Lenora. "Whose Stories Get Streamed? Netflix Tells More Africans: Yours." *Christian Science Monitor*, March 5, 2019. <https://www.csmonitor.com/World/Africa/2019/0305/Whose-stories-get-streamed-Netflix-tells-more-Africans-yours>.
- Bruce-Lockhart, Chelsea, and Emiko Terazono. "From Bean to Cup, What Goes into the Cost of Your Coffee?" *Financial Times*, London, June 4, 2019. <https://www.ft.com/content/44bd6a8e-83a5-11e9-9935-ad75bb96c849>.
- BSA | The Software Alliance. "2018 Global Cloud Computing Scorecard." 2018. [https://cloudscorecard.bsa.org/2018/pdf/BSA\\_2018\\_Global\\_Cloud\\_Scorecard.pdf](https://cloudscorecard.bsa.org/2018/pdf/BSA_2018_Global_Cloud_Scorecard.pdf).
- Bubear, Ryan. "Ford's Production Capacity in South Africa Reaches New High." *Car Magazine* (South Africa), October 31, 2018. <https://www.carmag.co.za/news/fords-production-capacity-in-south-africa-reaches-new-high/>.
- Buelens, Christian, and Marcel Tirpák. "Reading the Footprints: How Foreign Investors Shape Countries' Participation in Global Value Chains." European Central Bank (ECB) Working Paper Series 2060, May 2017. <https://link.springer.com/article/10.1057/s41294-017-0036-2>.
- Bungane, Babalwa. "Nigeria Signs MoU with GE for Five Solar Power Plants." *ESI Africa* (South Africa), November 30, 2016. <https://www.esi-africa.com/news/nigeria-signs-mou-with-ge-for-five-solar-power-plants/>.
- Bureau van Dijk. Zephyr M&A database (accessed various dates).
- Busari, Stephanie, and Osman Mohamed Osman. "Nigerians Can Now View YouTube Offline." CNN, July 28, 2017. <https://www.cnn.com/2017/07/28/africa/google-sundar-pichai-nigeria-visit/index.html>.
- Bushveld Minerals. "Vanadium Overview." <https://www.bushveldminerals.com/about-vanadium/>. (accessed September 25, 2019).
- Business in Cameroon*. "Cameroon: GDP Rose 4.5% in Q4 2018, Driven by Services Sector." May 23, 2019. <https://www.businessincameroon.com/economy/2305-9153-cameroon-gdp-rose-4-5-in-q4-2018-driven-by-services-sector>.
- Business Report* (South Africa). "Rand Refinery in Deal to Sell Gold in US." May 16, 2013. <https://www.iol.co.za/business-report/companies/rand-refinery-in-deal-to-sell-gold-in-us-1517116>
- Business Report* (South Africa). "What 2019 Holds in Store for the Pharmaceutical Sector." January 2019. <https://www.iol.co.za/business-report/economy/what-2019-holds-in-store-for-pharmaceutical-sector-19127833>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Business Wire. "Analyzing the Global Beer Industry 2019." September 9, 2019.

<https://www.businesswire.com/news/home/20190909005737/en/Analyzing-Global-Beer-Industry-2019---ResearchAndMarkets.com>.

Business Wire. "Ford Will Assemble Best-Selling Ranger Trucks in Nigeria." August 11, 2015.

<https://www.businesswire.com/news/home/20150811005742/en/Ford-Assemble-Best-Selling-Ranger-Trucks-Nigeria>.

Business Wire. "Kosmos Energy Celebrates First Oil from \$3.3 Billion Jubilee Field Development Offshore Republic of Ghana." December 15, 2010.

<https://www.businesswire.com/news/home/20101214007095/en/Kosmos-Energy-Celebrates-Oil-3.3-Billion-Jubilee>.

Butcher, Arona, Wen Jin Yuan, and Ujjwal Uppuluri. "China's Outward Foreign Direct Investment in Sub-Saharan Africa." U.S. International Trade Commission, Executive Briefing on Trade, July 2019.

[https://www.usitc.gov/publications/332/executive\\_briefings/ebot\\_chinaofditossabutceryuanuppulurri.pdf](https://www.usitc.gov/publications/332/executive_briefings/ebot_chinaofditossabutceryuanuppulurri.pdf).

Buxbaum, Peter. "\$5 Billion in US Scrap Exports in Jeopardy." *American Journal of Transportation*, February 28, 2018. <https://www.ajot.com/premium/ajot-5-billion-in-us-scrap-exports-in-jeopardy>.

CB. See Centre for the Promotion of Imports from developing countries.

Cable.co.uk (UK). "Worldwide Mobile Data Pricing: The Cost of 1GB of Mobile Data in 230 Countries." March 5, 2019. <https://www.cable.co.uk/mobiles/worldwide-data-pricing/>.

Candy Industry. "Barry Callebaut Opens Cocoa Processing Unit in Côte d'Ivoire." April 3, 2019.

<https://www.candyindustry.com/articles/88613-barry-callebaut-opens-cocoa-processing-unit-in-c%C3%B4te-divoire>.

Candy Industry. "Mars Wrigley Confectionery Takes New Actions to Move toward Deforestation-Free Cocoa Supply Chain." March 27, 2019. <https://www.candyindustry.com/articles/88604-mars-wrigley-confectionery-takes-new-actions-to-move-toward-deforestation-free-cocoa-supply-chain>.

Capital Ethiopia. "Intercontinental Addis Ordered to Change Name." March 10, 2019.

[https://www.capitalethiopia.com/wp-content/uploads/2019/03/Capital\\_March\\_10\\_-Iss-1057\\_2019.pdf](https://www.capitalethiopia.com/wp-content/uploads/2019/03/Capital_March_10_-Iss-1057_2019.pdf).

CarbikeTech. "CBU, CKD, SKD: What Are These Manufacturing Processes?" September 23, 2018.

<https://carbiketech.com/automotive-manufacturing-cbu-ckd-skd/>.

Cargill. *The 2017/2018 Cargill Cocoa & Chocolate Sustainability Report*, 2018.

<https://www.cargill.com/static/cocoa-sustainability/#page=24>.

Cargill. "Cargill Coop Academy." <https://www.cargill.com/story/cargill-coop-academy> (accessed October 16, 2019).

- Cargill. "Cargill Coop Academy helps upskill West African cocoa farmers." July 9, 2018. <https://www.cargill.com/story/cargill-coop-academy-helps-upskill-west-african-cocoa-farmers?sf193382034=1>.
- Cargill. "IFC Partnership Launch Coop Academy 2.0 to Empower Cocoa Producing Cooperatives." 2019. <https://medium.com/@logupdateafrica/cargill-ifc-partnership-launch-coop-academy-2-0-to-empower-cocoa-producing-cooperatives-fbef9f4425a3>.
- Cars.com. "What Is an OEM?" September 5, 2017. <https://www.cars.com/articles/what-is-an-oem-1420696948647/>.
- Carter, Michael R., Lan Cheng, and Alexandros Sarris. "Where and How Index Insurance Can Boost the Adoption of Improved Agricultural Technologies." *Journal of Development Economics* 118 (2016): 59–71. <https://www.sciencedirect.com/science/article/pii/S0304387815000991>.
- CB Insights. "What Are Smart Cities?" January 9, 2019. <https://www.cbinsights.com/research/what-are-smart-cities/>.
- CEN-SAD. See Community of Sahel-Saharan States (CEN-SAD).
- Central Intelligence Agency (CIA). See U.S. Central Intelligence Agency (CIA).
- Centre for Aviation (CAPA) (Australia). "Africa Aviation Outlook 2019: Change May Be in the Air—At Last." CAPA-Centre for Aviation, January 31, 2019. <https://centreforaviation.com/analysis/airline-leader/africa-aviation-outlook-2019-change-may-be-in-the-air--at-last-457938>.
- ChainPoint. "Blockchain." <https://www.chainpoint.com/solutions/blockchain/> (accessed July 26, 2019).
- ChainPoint. "The Rainforest Alliance." <https://www.chainpoint.com/our-customers/rainforest-alliance/> (accessed July 26, 2019).
- Chamber of Mines of Namibia. *2018 Annual Review*, 2019. [http://www.chamberofmines.org.na/files/4415/5775/9224/CoMoN\\_Annual\\_Review\\_Final\\_web.pdf](http://www.chamberofmines.org.na/files/4415/5775/9224/CoMoN_Annual_Review_Final_web.pdf).
- Chamber of Mines of Zimbabwe. "Production Statistics." <http://chamberofminesofzimbabwe.com/production-statistics/> (accessed November 21, 2019).
- Chapman, Catherine. "Digital Rights in Ethiopia: Change in Government Spurs Hopes for Cybercrime Law Review." *Daily Swig*, PortSwigger Web Security (UK), October 17, 2019. <https://portswigger.net/daily-swig/digital-rights-in-ethiopia-change-in-government-spurs-hopes-for-cybercrime-law-review>.
- Charles, Dan. "Fair Trade Helps Farmers, but Not Their Hired Workers." *The Salt (blog)*, NPR, July 1, 2019. <https://www.npr.org/sections/thesalt/2019/07/01/736721302/fair-trade-helps-farmers-but-not-their-hired-workers>.

- Charles, Dan. "Our Love of 'All Natural' Is Causing a Vanilla Shortage." *NPR Morning Edition*, June 16, 2017. <https://www.npr.org/sections/thesalt/2017/06/16/527576487/our-love-of-all-natural-is-causing-a-vanilla-shortage>.
- Chima, Ekenyerengozi Michael. "Active Film Distribution Companies in Nigeria and the Vicious Circle of Movie Piracy." *Shadow and Act*, April 20, 2017. <https://shadowandact.com/active-film-distribution-companies-in-nigeria-and-the-vicious-circle-of-movie-piracy/>.
- Chinook Observer* (Long Beach, Washington). "Warm Ocean Possible Culprit in 2015 Hake Collapse." March 8, 2016. [https://www.chinookobserver.com/news/local/warm-ocean-possible-culprit-in-hake-collapse/article\\_cc7ca245-024d-503e-a094-a07819cff196.html](https://www.chinookobserver.com/news/local/warm-ocean-possible-culprit-in-hake-collapse/article_cc7ca245-024d-503e-a094-a07819cff196.html).
- Chipeta, Joseph. "A Review of E-government Development in Africa: A Case of Zambia." *Journal of e-Government Studies and Best Practices* (2018): October 17, 2018. <https://ibimapublishing.com/articles/JEGSBP/2018/973845/973845.pdf>.
- Chironga, Mutsa, Hilary De Grandis, and Yassir Zouaoui. "Mobile Financial Services in Africa: Winning the Battle for the Customer." McKinsey, September 2017. <https://www.mckinsey.com/industries/financial-services/our-insights/mobile-financial-services-in-africa-winning-the-battle-for-the-customer>.
- Chironga, Mutsa, Luis Cunha, Hilary De Grandis, and Mayowa Kuyoro. "African Retail Banking's Next Growth Frontier." McKinsey, February 2018. <https://www.mckinsey.com/industries/financial-services/our-insights/african-retail-bankings-next-growth-frontier>.
- Chironga, Mutsa, Luis Cunha, Hilary De Grandis, and Mayowa Kuyoro. "Roaring to Life: Growth and Innovation in African Retail Banking." McKinsey, February 2018. <https://www.mckinsey.com/~media/McKinsey/Industries/Financial%20Services/Our%20Insights/African%20retail%20bankings%20next%20growth%20frontier/Roaring-to-life-growth-and-innovation-in-African-retail-banking-web-final.ashx>.
- Choi, Jieun, Mark Dutz, and Zainab Usman. *The Future of Work in Africa: Harnessing the Potential of Digital Technologies for All*. World Bank, August 1, 2019. <https://openknowledge.worldbank.org/handle/10986/3212>.
- Christensen, Sofia. "Tens of Thousands Die in Africa Each Year Due to Fake Drugs." November 15, 2018. <https://www.reuters.com/article/us-westafrica-drugs-fake/tens-of-thousands-die-in-africa-each-year-due-to-fake-drugs-idUSKCN1NK23I>.
- Christie, Ian, Eneida Fernandes, Hannah Messerli, and Louise Twinning-Ward. *Tourism in Africa: Harnessing Tourism for Growth and Improved Livelihoods*. World Bank Group, Publication 81468, 2013. <http://documents.worldbank.org/curated/en/723511468102894381/pdf/814680WPOP13260Box0379837B00PUBLIC0.pdf>.
- Chutel, Lynsey. "South Africa Is Taking its Breakup with General Motors Badly." Quartz Africa, May 19, 2017. <https://qz.com/africa/987602/general-motors-decision-to-disinvest-from-south-africa-seen-as-a-blow-to-struggling-economy/>.

- Cirera, Xavier, Filipe Lage, and Leonard Sabetti. "ICT Use, Innovation, and Productivity: Evidence from Sub-Saharan Africa." World Bank, Policy Research Working Paper no. 7868, 2016. <https://openknowledge.worldbank.org/handle/10986/25313>.
- Cisco. "Cisco Global Cloud Index: Forecast and Methodology 2016–2021." White paper, 2018. <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/global-cloud-index-gci/white-paper-c11-738085.html>.
- Cisco. "Fog Computing and the Internet of Things: Extend the Cloud to Where the Things Are." White paper, 2015. [https://www.cisco.com/c/dam/en\\_us/solutions/trends/iot/docs/computing-overview.pdf](https://www.cisco.com/c/dam/en_us/solutions/trends/iot/docs/computing-overview.pdf).
- Cisco. "Global Cloud Index." 2018. <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/global-cloud-index-gci/white-paper-c11-738085.html>.
- Cisco. "Cloud Readiness Tool." 2018. [https://www.cisco.com/c/dam/m/en\\_us/service-provider/ciscoknowledgenetwork/files/547\\_11\\_10-15-DocumentsCisco\\_GCI\\_Deck\\_2014-2019\\_for\\_CKN\\_10NOV2015.pdf](https://www.cisco.com/c/dam/m/en_us/service-provider/ciscoknowledgenetwork/files/547_11_10-15-DocumentsCisco_GCI_Deck_2014-2019_for_CKN_10NOV2015.pdf).
- Cision PR Newswire. "South Africa Healthcare Sector Report 2019." News release, May 14, 2019. <https://www.prnewswire.com/news-releases/south-africa-healthcare-sector-report-2019-300851687.html>.
- Clark, Stewart. "African SVOD Is Growing but Analysts Foresee Challenges." *Variety*, July 23, 2018. <https://variety.com/2018/tv/news/african-svod-growing-but-challenged-1202880973/>.
- Cobalt Institute. "Production and Supply." <https://www.cobaltinstitute.org/production-and-supply.html> (accessed September 19, 2019).
- Cobalt Institute. "Rechargeable Batteries." <https://www.cobaltinstitute.org/rechargeable-batteries.html> (accessed September 19, 2019).
- Coca-Cola Company. *2018 Business and Sustainability Report*, April 2019. <https://www.coca-colacompany.com/content/dam/journey/us/en/private/fileassets/pdf/2019/Coca-Cola-Business-and-Sustainability-Report.pdf>.
- Coca-Cola Company. "Form 10-K." Annual report for Securities and Exchange Commission, February 21, 2019. <https://www.coca-colacompany.com/content/dam/journey/us/en/private/fileassets/pdf/2019/annual-shareholders-meeting/2018-Annual-Report-on-Form-10-K.pdf>.
- Coca-Cola Great Britain. "Sourcing Map." <https://www.coca-cola.co.uk/SourcingMap> (accessed October 16, 2019).
- Coca-Cola Hellenic Bottling Company. "Responsible and Sustainable Source." <https://coca-colahellenic.com/en/sustainability/environment/responsible-sourcing/> (accessed October 19, 2019).

- Coccia, Mario. "Classifications of Innovations: Survey and Future Directions." *SSRN Electronic Journal*, 2006. <https://doi.org/10.2139/ssrn.2581746>.
- Cochrane, Nancy. "South Africa Resumes Imports of U.S. Chicken Following 15 Years of Anti-Dumping Duties." U.S. Department of Agriculture. Economic Research Service. *Amber Waves*, March 6, 2017. <https://www.ers.usda.gov/amber-waves/2017/march/south-africa-resumes-imports-of-us-chicken-following-15-years-of-anti-dumping-duties/>.
- Cochrane, Nancy, James Hansen, and Ralph Seeley. *Poultry Production and Trade in the Republic of South Africa: A Look at Alternative Trade Policy Scenarios*. U.S. Department of Agriculture. Economic Research Service. Outlook, AES-96, November 2016. <https://www.ers.usda.gov/webdocs/publications/81067/aes-96.pdf?v=42690>.
- Coffin, David, and Jeff Horowitz. "The Supply Chain for Electric Vehicle Batteries." *Journal of International Economics* (JICE), U.S. International Trade Commission (USITC), December 2018. [https://www.usitc.gov/publications/332/journals/the\\_supply\\_chain\\_for\\_electric\\_vehicle\\_batteries.pdf](https://www.usitc.gov/publications/332/journals/the_supply_chain_for_electric_vehicle_batteries.pdf).
- Coffin, David, Jeff Horowitz, Danielle Nesmith, and Mitchell Semanik. "Examining Barriers to Trade in Used Vehicles." U.S. International Trade Commission. Office of Industries Working Paper ID-044, August 2016. [https://www.usitc.gov/sites/default/files/publications/332/used\\_vehicle\\_wp\\_id-44\\_final\\_web\\_0.pdf](https://www.usitc.gov/sites/default/files/publications/332/used_vehicle_wp_id-44_final_web_0.pdf).
- Cokayne, Roy. "Fears for 600 Jobs as Auto Trim Firm Exits SA." *Business Report* (South Africa), September 29, 2014. <https://www.iol.co.za/business-report/economy/fears-for-600-jobs-as-auto-trim-firm-exits-sa-1756995>.
- Cokayne, Roy. "GMSA, Tenneco Win R6bn Order." *Business Report* (South Africa), July 3, 2013. <https://www.iol.co.za/business-report/economy/gmsa-tenneco-win-r6bn-order-1541049>.
- Collon, Cyril, and Tidjane Dème. "2018 Was a Monumental Year for African Tech Start-ups." Partech Partners (France), 2019. [https://partechpartners.com/documents/6/2019.03.22\\_-\\_Africa\\_Tech\\_Startups\\_raises\\_1.163B\\_in\\_2018\\_Partech-Report\\_nQIOkE7.pdf](https://partechpartners.com/documents/6/2019.03.22_-_Africa_Tech_Startups_raises_1.163B_in_2018_Partech-Report_nQIOkE7.pdf).
- Common Market for Eastern Southern Africa (COMESA). "COMESA Member States." <http://www.comesa.int/comesa-members-states/> (accessed February 5, 2020).
- Common Market for Eastern and Southern Africa (COMESA). "COMESA Objectives and Priorities." <https://www.comesa.int/company-overview-2/> (accessed September 30, 2019).
- Common Market for Eastern and Southern Africa (COMESA). "Countries Participating in the COMESA FTA Set to Increase." News release, September 27, 2019. <https://www.comesa.int/2019/09/27/countries-participating-in-the-comesa-fta-set-to-increase/>.
- Common Market for Eastern and Southern Africa (COMESA). "Latest News: More Countries Ratify Tripartite Free Trade Agreement." News release, January 17, 2020. <https://www.comesa.int/more-countries-ratify-tripartite-free-trade-area-agreement/>.

- Common Market for Eastern and Southern Africa (COMESA) Secretariat. "The COMESA Regional Strategy for AGOA." August 2018.
- Community of Sahel-Saharan States (CEN-SAD). "Communauté des Etats Sahélo-Sahariens." <http://www.censad.org/> (accessed September 30, 2019).
- Congressional Research Service (CRS). *African Growth and Opportunity Act (AGOA): Background and Reauthorization*, by B. R. Williams. CRS Report 43173, April 22, 2015. <https://fas.org/sgp/crs/row/R43173.pdf>.
- Cory, Nigel. Information Technology and Innovation Foundation (ITIF). Written submission to the U.S. International Trade Commission in connection with Inv. No. 332-571, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments*, August 15, 2019.
- Corning, Inc. "Corning Recognized as a Top Global Supplier by Daimler." News release, March 7, 2019. <https://www.corning.com/worldwide/en/about-us/news-events/news-releases/2019/03/corning-recognized-as-a-top-global-supplier-by-daimler.html>.
- Cornish, Lauren. "Sibanye-Stillwater: Grounded in Gold, Flourishing in PGMs." *Mining Review Africa*, September 2019. <https://www.miningreview.com/gold/sibanye-stillwater-grounded-in-gold-flourishing-in-pgms/>.
- Cotterill, Joseph. "Goldman Sachs Plots South Africa Banking Expansion." *Financial Times*, May 5, 2019. <https://www.ft.com/content/05a50dda-76f2-11e9-be7d-6d846537acab>.
- Cotteril, Joseph. "Zimbabwe Strikes Milestone IMF Deal to Boost New Currency." *Financial Times*, May 31, 2019. <https://www.ft.com/content/98501a46-822b-11e9-9935-ad75bb96c849>.
- Cotton Producers and Merchant Association (COPMA). "Issues as Nigerian Farmers Welcome GMO Cotton." <http://copma.com.ng/news-details.php> (accessed November 26, 2019).
- Cotton Technical Assistance Programme for Africa (CTAP). "Country Profile: Nigeria." n.d. <http://www.cottontapafrika.org/nigeria.html> (accessed November 12, 2019).
- Coulibaly, H.E. Tièna. "The Progress of West African Cotton Production and Trade." Speech by Ambassador of Mali to the United States. U.S. Department of Agriculture (USDA), OCE Forum, 2017. [https://www.usda.gov/oce/forum/past\\_speeches/2017/2017\\_Speeches/HE\\_Tiena\\_Coulibaly.pdf](https://www.usda.gov/oce/forum/past_speeches/2017/2017_Speeches/HE_Tiena_Coulibaly.pdf).
- Counterpoint. "Infographic: Q1-2019 Mobile Market Monitor." June 4, 2019. <https://www.counterpointresearch.com/infographic-q1-2019-mobile-market-monitor/>.
- Counterpoint. "Smart Feature Phones to Create US \$28 Billion Revenue Opportunity." News release, February 18, 2019. <https://www.counterpointresearch.com/smart-feature-phones-create-us28-billion-revenue-opportunity/>.

Cowley, Alison. *PGM Market Report May 2019*. May 2019.

[http://www.platinum.matthey.com/documents/new-item/pgm%20market%20reports/pgm\\_market\\_report\\_may\\_19.pdf](http://www.platinum.matthey.com/documents/new-item/pgm%20market%20reports/pgm_market_report_may_19.pdf).

CropLife International. "Cost of Bringing a Biotech Crop to Market." n.d. <https://croplife.org/plant-biotechnology/regulatory-2/cost-of-bringing-a-biotech-crop-to-market/> (accessed November 12, 2019).

Currison, Brandon. "An Alternative Investment with WorldCover." *Seedstars*, July 19, 2019.

<https://medium.com/@brandoncurrison/an-alternative-investment-with-worldcover-91f4fd8dacb5>. <https://www.seedstars.com/magazine/alternative-investment-worldcover/>.

Customs and Border Patrol (CBP). See U.S. Department of Homeland Security (USDHS). U.S. Customs and Border Protection (USCBP).

Dada, Lade A. "The African Export Industry: What Happened and How Can It Be Revived? Case Study on the Kenyan Coffee Sector." Food and Agriculture Organization of the United Nations. Agricultural Management, Marketing and Finance Working Document, 2007.

<http://www.fao.org/sustainable-food-value-chains/library/details/en/c/262876/>.

Dahir, Abdi Latif. "Africa's Dominant Mobile Money Service Is Going Global." Quartz Africa, November 7, 2018. <https://qz.com/africa/1453797/western-union-in-mobile-money-deal-with-safaricom-mpesa/>.

Dahir, Abdi Latif. "Digital Lending Apps Are Coming Under Scrutiny in East Africa for Predatory Practices." Quartz Africa, September 20, 2019. <https://qz.com/africa/1712796/mobile-loans-apps-tala-branch-okash-face-scrutiny-in-kenya/>.

Dahir, Abdi Latif. "Ethiopian Airlines Is Doubling Down on Its Africa Expansion Plans, Despite the Boeing Crisis." Quartz Africa, March 27, 2019. <https://qz.com/africa/1580802/despite-boeing-737-crash-ethiopian-airlines-to-expand-in-africa/>.

Dahir, Abdi Latif. "International Carriers Still Dominate Africa's Most Profitable Air Routes." Quartz Africa, August 27, 2019. <https://qz.com/africa/1695950/emirates-british-airways-run-africas-most-profitable-air-routes/>.

Dahir, Abdi Latif. "It Would Be Tough for Fast-growing Ethiopian Airlines to Break Up with Boeing." Quartz Africa, March 19, 2019. <https://qz.com/africa/1575919/boeing-has-deep-60-year-roots-with-ethiopian-airlines/>.

Dahir, Abdi Latif. "M-Pesa and PayPal Are Partnering to Boost E-commerce in Kenya." Quartz Africa, April 20, 2018. <https://qz.com/africa/1247879/safaricom-m-pesa-and-paypal-deal-to-boost-kenya-e-commerce/>.

Dahir, Abdi Latif. "Smart Feature Phones with 'Light' Operating Systems Are the Future of Africa's Mobile Growth." Quartz Africa, February 26, 2019. <https://qz.com/africa/1559132/orange-mtn-smart-feature-phones-use-kaios-operating-system/>.

- Daleel Oil & Gas Supply Chain Portal. "OCTG (Casing and Tubing)." <https://www.scmdaleel.com/category/octg-casing-amp-tubing/104> (accessed October 22, 2019).
- Daly, Jack, Ajmal Abdulsamad, and Gary Gereffi. "Regional Value Chains in East Africa: Summary Report." Duke Center on Globalization, Governance, and Competitiveness, 2016. [https://gvcc.duke.edu/wp-content/uploads/2016-09-30\\_IGC\\_Summary-Paper\\_Final.pdf](https://gvcc.duke.edu/wp-content/uploads/2016-09-30_IGC_Summary-Paper_Final.pdf).
- Damgaard, Jannick, Thomas Elkjaer, and Niels Johannesen. "What is real and what is not in the global FDI network?" IMF Working Papers, December 11, 2019. <https://www.imf.org/en/Publications/WP/Issues/2019/12/11/what-is-real-and-what-is-not-in-the-global-fdi-network>.
- Daniel, Eniola. "Movie Producers Call for Dissolution of Film, Video Censors Board over Alleged Graft." *Guardian*, January 2, 2019. <https://guardian.ng/art/movie-producers-call-for-dissolution-of-film-video-censors-board-over-alleged-graft/>.
- Data Protection Commission (Ghana). "Welcome to Data Protection Commission." <https://www.dataprotection.org.gh/> (accessed October 16, 2019).
- Davidson, Brett. "The Mobile Phone Chimera." *Africa Is a Country*, July 12, 2011. <https://africasacountry.com/2011/07/mobile-phones>.
- Davis, Louise. "What Does the Current South African E-commerce Landscape Look Like?" Flickerleap, April 7, 2019. <https://flickerleap.com/south-african-ecommerce-landscape/>.
- Davis, Stacy C., and Robert G. Boundy. *Transportation Energy Data Book*. Ed. 37.2. Oak Ridge, TN: Oak Ridge National Laboratory, 2019. <https://tedb.ornl.gov>.
- De Beers. "The Diamond Insight Report 2018." September 13, 2018. <https://www.debeersgroup.com/~media/Files/D/De-Beers-Group/documents/reports/insights/the-diamond-insight-report-2018.pdf>.
- De Coster, Jozef. "Nigerian Textile Industry." Fibre2Fashion, November 12, 2019. <https://www.fibre2fashion.com/industry-article/8071/china-swallows-up-nigeria>.
- De Jonge, Bram. "Plant Variety Protection in Sub-Saharan Africa: Balancing Commercial and Smallholder Farmers' Interest." *Journal of Politics and Law*, August 2014. <http://dx.doi.org/10.5539/jpl.v7n3p100>.
- De Leon, Riley. "Zipline Takes Flight in Ghana, Making It the World's Largest Drone-Delivery Network." CNBC, April 24, 2019. <https://www.cnbc.com/2019/04/24/with-ghana-expansion-ziplines-medical-drones-now-reach-22m-people.html>.
- Defawe, Olivier. "It Takes a Village to Deliver the First Vaccines by Drone in DRC." VillageReach, August 27, 2019. <https://www.villagereach.org/2019/08/27/it-takes-a-village-to-deliver-the-first-vaccines-by-drone-in-drc/>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Deglmann, Joe. "Infographic: South African Airways' Fleet Changes, 2006–16." Inside MRO, Aviation WeekNetwork (Informa Markets, UK)., January 31, 2017. <https://www.mro-network.com/airlines/infographic-south-african-airways-fleet-changes-2006-16>.
- Deidda, Luca, and Bassam Fattouh. "Banks, Financial Markets and Growth." *Journal of Financial Intermediation* 17, no. 1 (January 2008): 6–36. <https://doi.org/10.1016/j.jfi.2006.04.003>.
- Deloitte. *Invest in Ethiopia: Structural Reforms Set to Unlock East Africa's Largest Economy*. June 2019. [https://www2.deloitte.com/content/dam/Deloitte/za/Documents/Consumer\\_Industrial\\_Products/ZA\\_Deloitte\\_Invest\\_In\\_Ethiopia\\_July%202019.pdf](https://www2.deloitte.com/content/dam/Deloitte/za/Documents/Consumer_Industrial_Products/ZA_Deloitte_Invest_In_Ethiopia_July%202019.pdf).
- Deloitte. "Nigeria's Automotive Industry Plans: What Exactly Are the Expectations?" 2015. <https://www2.deloitte.com/ng/en/pages/tax/articles/inside-tax-articles/nigerias-automotive-industry-plans-what-exactly-are-the-expectations-2.html>.
- Deloitte. "Africa Is Ready to Leapfrog the Competition through Smart Cities Technology." 2014. [https://www2.deloitte.com/content/dam/Deloitte/za/Documents/public-sector/ZA\\_SmartCities\\_12052014.pdf](https://www2.deloitte.com/content/dam/Deloitte/za/Documents/public-sector/ZA_SmartCities_12052014.pdf).
- Deloitte. *Industry 4.0: Is Africa Ready for Digital Transformation?* 2016. <https://www2.deloitte.com/content/dam/Deloitte/za/Documents/manufacturing/za-Africa-industry-4.0-report-April14.pdf>.
- Deloitte. *Navigating the African Automotive Sector: Ethiopia, Kenya and Nigeria*, 2018. <https://www2.deloitte.com/za/en/pages/manufacturing/articles/navigating-the-african-automotive-sector--ethiopia--kenya-and-ni.html>.
- Delta Air News Hub. "More Access to Africa on Delta." News release, August 20, 2017. <https://news.delta.com/more-access-africa-delta-new-york-jfk-nonstop-service-lagos>.
- Demirgüç-Kunt, Asli, Leora Klapper, Dorothe Singer, Saniya Ansar, and Jake Hess. "The Global Findex Database 2017." World Bank Group, 2018. <https://globalfindex.worldbank.org/sites/globalfindex/files/overview/211259ov.pdf>.
- Dercon, Stefan. "Income Risk, Coping Strategies, and Safety Nets." *World Bank Research Observer* 17, no. 2 (September 1, 2002): 141–66. <https://doi.org/10.1093/wbro/17.2.141>.
- Dercon, Stefan. "Risk, Insurance, and Poverty: A Review." In *Insurance against Poverty*, edited by Stefan Dercon, 9–37. Oxford: Oxford University Press, 2005.
- Devarajan, Shantayanan, Delfin S. Go, Jeffrey D. Lewis, Sherman Robinson, and Pekka Sinko. "Simple General Equilibrium Modeling." Chap. 6 in *Applied Methods for Trade Policy Analysis: A Handbook*, edited by Joseph F. Francois and Kenneth A. Reinert. Cambridge: Cambridge University Press, 1997.
- Development Alternatives Incorporated (DAI) and Tanzania Ministry of Industry, Trade and Investment. *Tanzania National AGOA Strategy*, May 10, 2016. <https://agoa.info/images/documents/6213/tanzania-agoa-strategy-final.pdf>.

- Dexis Consulting Group. *Improving Business Environments for Agile Markets (IBEAM): AGOA National Strategy; The Republic of Ghana*, November 4, 2016.  
<https://agoa.info/images/documents/15271/ghanaagostrategy.pdf>.
- Di Castri, Simone, Matt Grasser, and Arend Kulenkampff. "Financial Authorities in the Era of Data Abundance: RegTech for Regulators and SupTech Solutions." 2018.  
<https://ssrn.com/abstract=3249283>.
- Diageo plc. *Annual Report 2019*, 2019. [https://www.diageo.com/PR1346/aws/media/7946/b3801-000797\\_diageo\\_ar2019\\_strategic-report.pdf](https://www.diageo.com/PR1346/aws/media/7946/b3801-000797_diageo_ar2019_strategic-report.pdf).
- Didenko, Anton. "Regulating Fintech: Lessons from Africa." *San Diego International Law Journal* 19, Issue 2 (June 15, 2018): 313–68.  
<https://digital.sandiego.edu/cgi/viewcontent.cgi?article=1063&context=ilj>.
- DieselNet. "Corning Opens Catalytic Converter Substrate Plant in South Africa." June 12, 2000.  
<https://www.dieselnet.com/news/2000/06corning.php>.
- Digital TV News. "Africa to Reach 10 Million SVOD Subscribers by 2023." June 26, 2018.  
<http://www.digitaltvnews.net/?p=31152>.
- Domat, Chloe. "Fintech Deals and Dollars Sweep through Africa." *Global Finance*, May 7, 2019.  
<https://www.gfmag.com/magazine/may-2019/fintech-deals-and-dollars-sweep-through-africa>.
- DrinkStuff South Africa. "Heineken Takes Another Gulp of SA Craft Beer." October 1, 2017.  
<https://www.drinkstuff-sa.co.za/heineken-takes-another-gulp-sa-craft-beer/>.
- Dube, Chakalisa. "Lobatse Automotive Plant Readies for Operations." *Mmegionline*, March 4, 2016.  
<https://www.mmegi.bw/index.php?aid=58304&dir=2016/march/04>.
- Dutta, Soumitra, Bruno Lanvin, and Sacha Wunsch-Vincent. *Global Innovation Index 2019: Creating Healthy Lives—The Future of Medical Innovation*. Ithaca, NY: Cornell University; Fontainebleau, France: INSEAD; and Geneva: WIPO, 2019.  
[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf).
- East African Community (EAC). "About the EAC." <https://www.eac.int/about-eac> (accessed September 27, 2019).
- East African Community (EAC). "Current Status." <https://www.eac.int/overview-of-eac> (accessed September 27, 2019).
- East African Community (EAC). "Customs Union." <https://www.eac.int/customs-union> (accessed September 27, 2019).
- East African Community (EAC). "EAC Railways Sub-Sector Projects." <https://www.eac.int/infrastructure/railways-transport-sub-sector/projects> (accessed October 31, 2019).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

East African Community (EAC). “Overview of EAC.” <https://www.eac.int/overview-of-eac> (accessed September 27, 2019).

East African Community (EAC). “Partner States.” <https://www.eac.int/eac-partner-states> (accessed February 5, 2020).

East African Community (EAC). “Press Statement.” <https://www.eac.int/statements/1543-press-statement-clarification-of-issues-reported-by-the-east-african-newspaper-of-10th-16th-august,-2019> (accessed September 27, 2019).

eBay. “eBay Partners with Mall for Africa to Bring Handmade Goods to U.S.” Press release, August 22, 2017. <https://www.ebayinc.com/stories/news/ebay-partners-with-mall-for-africa-to-bring-african-handmade-goods-to-us/>.

Eberspacher. “Subsidiary.” <https://www.eberspacher.com/en/worldwide-old/standorte/south-africa/port-elizabeth.html> (accessed September 24, 2019).

ECOFIN Agency. “Southern and Eastern African Countries to Launch a Tripartite Free Trade Area in 2020.” September 5, 2019. <https://www.ecofinagency.com/public-management/0509-40462-southern-and-eastern-african-countries-to-launch-a-tripartite-free-trade-area-in-2020>.

E-commerce Foundation. *African E-commerce Report, 2018*, 2018. <https://embed.ecommercewiki.org/reports/767/africa-ecommerce-report-2018-free/download>.

Economic Community of Central African States (ECCAS). “Etats Membres” (member states). <http://www.ceeac-eccas.org/index.php/fr/> (accessed February 5, 2020).

Economic Community of West African States (ECOWAS). “Basic Information.” <https://www.ecowas.int/about-ecowas/basic-information/> (accessed September 27, 2019).

Economic Community of West African States (ECOWAS). “ECOWAS Moves to Ensure Biosafety in the Region.” May 18, 2019. <https://www.ecowas.int/ecowas-moves-to-ensure-biosafety-in-the-region/>.

Economic Community of West African States (ECOWAS). “ECOWAS Seeks to Popularize the Use of Liquefied Petroleum Gas in the Region.” August 10, 2018. <https://www.ecowas.int/ecowas-seeks-to-popularize-the-use-of-liquefied-petroleum-gas-in-the-region/>.

Economic Community of West African States (ECOWAS). “History.” <https://www.ecowas.int/about-ecowas/history/> (accessed September 27, 2019).

Economic Community of West African States (ECOWAS). “Member States.” (accessed February 26, 2020) <https://www.ecowas.int/member-states/>.

Economic Community of West African States (ECOWAS). “Vision 2020.” <https://www.ecowas.int/about-ecowas/vision-2020/> (accessed September 27, 2019).

- Economist*. "Borrowing by Mobile Phone Gets Some Poor People into Trouble." November 17, 2018. <https://www.economist.com/finance-and-economics/2018/11/17/borrowing-by-mobile-phone-gets-some-poor-people-into-trouble>.
- Economist*. "Fintech Takes Aim at the Steep Cost of International Money Transfers." April 11, 2019. <https://www.economist.com/finance-and-economics/2019/04/11/fintech-takes-aim-at-the-steep-cost-of-international-money-transfers>.
- Economist*. "Turning Blockbusters Into Booty: Ethiopia's Ingenious Video Pirates." July 6, 2017. <https://www.economist.com/middle-east-and-africa/2017/07/06/ethiopias-ingenious-video-pirates>.
- Economist*. "Why Does Kenya Lead the World in Mobile Money?" March 2, 2015. <https://www.economist.com/the-economist-explains/2015/03/02/why-does-kenya-lead-the-world-in-mobile-money>.
- Economist*. "Why Fintech Won't Kill Banks." June 17, 2015. <https://www.economist.com/the-economist-explains/2015/06/16/why-fintech-wont-kill-banks>.
- Economist*. "Why the Lights Keep Going Out in South Africa." February 21, 2019. <https://www.economist.com/the-economist-explains/2019/02/21/why-the-lights-keep-going-out-in-south-africa>.
- Economist*. "Why There is a Worldwide Shortage of Vanilla." March 28, 2018. <https://www.economist.com/the-economist-explains/2018/03/28/why-there-is-a-worldwide-shortage-of-vanilla>.
- ECOWAS Trade Liberalization Scheme (ETLS). "ECOWAS Trade Liberalization Scheme (ETLS): About ETLS." <http://www.etls.ecowas.int/etls/about-etls/> (accessed October 08, 2019).
- Edinger, Hannah, and Jean-Pierre Labuschagne. "If You Want to Prosper, Consider Building Roads: China's Role in African Infrastructure and Capital Projects." Deloitte Insights, March 22, 2019. <https://www2.deloitte.com/us/en/insights/industry/public-sector/china-investment-africa-infrastructure-development.html>.
- Edwards, Caryn. "Netflix South Africa versus the World: What You Get for Your Money." The Southafrican.com, February 27, 2019. <https://www.thesouthafrican.com/lifestyle/sa-tv-film/netflix-south-africa-versus-the-world-what-you-get-for-your-money/>.
- EIA. See U.S. Energy Information Administration (EIA).
- Ekwealor, Victor. "Online Video Content Is Not King in Nigeria." Techpoint Africa, March 7, 2019. <https://techpoint.africa/2019/03/07/online-video-content-nigeria/>.
- Eleaf. "FruitLook—Another Year of Efficient Farming Using Satellite Data." <https://eleaf.com/?p=6225> (accessed December 5, 2019).
- eMarketer. "Global Ecommerce, 2019." June 27, 2019. <https://www.emarketer.com/content/global-ecommerce-2019>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Embassy of Nigeria. "Online Visa Application Requirements and Procedures."

<http://www.nigeriaembassyusa.org/index.php?page=visas> (accessed November 17, 2019).

eNCA. "Sibanye-Stillwater to Acquire Lonmin." December 14, 2017.

<https://www.enca.com/money/sibanye-stillwater-to-acquire-lonmin>.

Encyclopedia Britannica. "Electric-arc steelmaking."

<https://www.britannica.com/technology/steel/Electric-arc-steelmaking> (accessed February 25, 2020).

Energy Post. "How Offshore Lomé Threatens Nigeria's Petroleum Sector." January 31, 2018.

<https://energypostafrica.net/2018/01/31/how-offshore-lome-threatens-nigerias-petroleum-sector/>.

Epstein, Adam. "Pretty Much Everyone on Earth Can Now Get Netflix." Quartz, January 6, 2016.

<https://qz.com/587841/pretty-much-everyone-on-earth-can-now-get-netflix/>.

Ericsson. "Regional Subscriptions Outlook." *Ericsson Mobility Report*, June 2019.

<https://www.ericsson.com/en/mobility-report/reports/june-2019/regional-subscriptions-outlook>.

ESI Africa. "The Power of Smart Grid Technology." January 1, 2018. [https://www.esi-](https://www.esi-africa.com/industry-sectors/energy-efficiency/power-of-smart-grid-technology/)

[africa.com/industry-sectors/energy-efficiency/power-of-smart-grid-technology/](https://www.esi-africa.com/industry-sectors/energy-efficiency/power-of-smart-grid-technology/).

Esposito, Frank. "JV Formed to Buy M&G Texas Plant for Over \$1bn." *Plastics News Europe*, March 22,

2018. <https://www.plasticsnewseurope.com/article/20180322/PNE/180329958/jv-formed-to-buy-m-g-texas-plant-for-over-1bn>.

Ethiopian Airlines. "Ethiopian Current Commercial Fleet."

<https://www.ethiopianairlines.com/corporate/company/about-us/fleets> (accessed October 21, 2019).

*Ethiopian Herald*. "Raising Guard on Substandard, Counterfeit Drugs." April 17, 2018. Online at

AllAfrica.com. <https://allafrica.com/stories/201804180244.html>.

Ethiopian Intellectual Property Office (EIPO). "Office Launches Online Trademark Filing System."

December 21, 2020. [www.eipo.gov.et/news/-/asset\\_publisher/NxmRJ6i0k9Gz/content/office-launches-online-trademark-filing-system](http://www.eipo.gov.et/news/-/asset_publisher/NxmRJ6i0k9Gz/content/office-launches-online-trademark-filing-system).

Ethiopian Intellectual Property Office (EIPO). "The Ethiopian IP System." Presentation for U.S.

International Trade Commission, October 2019.

Ethiopian Investment Commission. "Fairfax Plans to Build USD 4 Bln Oil Refinery in Ethiopia." April 18,

2018. <http://www.investethiopia.gov.et/index.php/information-center/news-and-events/633-fairfax-plans-to-build-usd-4-bln-oil-refinery-in-ethiopia.html> (accessed September 3, 2019).

Ethiopian Textile Industry Development Institute (ETIDI). "About Us." <https://www.nift.ac.in/node/197>

(accessed November 1, 2019).

- European Community, "Countries and Regions: Andean Community." <https://ec.europa.eu/trade/policy/countries-and-regions/regions/andean-community/> (accessed October 23, 2019).
- European Union, General Data Protection Regulation 2016/679 (Regulation 2016/679 of the European parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC). <https://eur-lex.europa.eu/eli/reg/2016/679/oj>.
- Executive Office of the President. Proclamation no. 9383. 80 Fed. Reg. no. 80615 (December 24, 2015). <https://www.federalregister.gov/documents/2015/12/24/2015-32679/to-take-certain-actions-under-the-african-growth-and-opportunity-act-and-for-other-purposes>.
- Export Processing Zones Authority (EPZA) Kenya. "EPZ Program." <https://epzakenya.com/epz-program/> (accessed various dates).
- Export Processing Zones Authority (EPZA) Kenya. "Who We Are." <https://epzakenya.com/> (accessed November 5, 2019).
- Export.gov. "South Africa—E-commerce." July 14, 2019. <https://www.export.gov/article?id=South-Africa-ecommerce>.
- Export.gov. "Ethiopia—Banking Systems." December 11, 2018. <https://www.export.gov/article?id=Ethiopia-Banking-Systems>.
- Export-Import Bank of the United States (EXIM). "EXIM Approves \$5 Billion to Finance U.S. Exports to Mozambique LNG Project." September 26, 2019. <https://www.exim.gov/news/exim-approves-5-billion-finance-exports-mozambique-lng-project>.
- ExxonMobil. "Discovering Hidden Hydrocarbons: Using Seismic-Imaging Technology to Map Formations Far below the Earth's Surface." September 13, 2018. <https://corporate.exxonmobil.com/Energy-and-environment/Tools-and-processes/Exploration-technology/Discovering-hidden-hydrocarbons-using-seismic-imaging-technology-to-map-formations>.
- ExxonMobil. "ExxonMobil Acquires Exploration Acreage in Three Mauritania Offshore Blocks." Press release, December 4, 2017. <https://news.exxonmobil.com/press-release/exxonmobil-acquires-exploration-acreage-three-mauritania-offshore-blocks>.
- ExxonMobil. "Mobil Producing Nigeria Unlimited MPN Operations." <https://corporate.exxonmobil.com/Locations/Nigeria/Mobil-Producing-Nigeria-Unlimited-MPN-operations> (accessed October 18, 2019).
- ExxonMobil. "Rovuma LNG Phase 1 Development Plan Submitted to Government of Mozambique." Press release: July 9, 2018. <https://news.exxonmobil.com/press-release/rovuma-lng-phase-1-development-plan-submitted-government-mozambique>.
- EY. "Fintechs in Sub-Saharan Africa: An Overview of Market Developments and Investment Opportunities." 2019. [https://www.ey.com/Publication/vwLUAssets/ey-fin-tech-market-opportunities-2019/\\$File/ey-fin-tech-market-opportunities-2019.pdf](https://www.ey.com/Publication/vwLUAssets/ey-fin-tech-market-opportunities-2019/$File/ey-fin-tech-market-opportunities-2019.pdf).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

EY. "Spotlight on Oil and Gas Megaprojects." 2014. [https://www.ey.com/Publication/vwLUAssets/EY-spotlight-on-oil-and-gas-megaprojects/\\$FILE/EY-spotlight-on-oil-and-gas-megaprojects.pdf](https://www.ey.com/Publication/vwLUAssets/EY-spotlight-on-oil-and-gas-megaprojects/$FILE/EY-spotlight-on-oil-and-gas-megaprojects.pdf).

Ezega News. "Ethiopian IP Office to Establish IP Courts to Handle Disputes." April 19, 2017. <https://www.ezega.com/News/NewsDetails/4148/Ethiopian-IP-Office-to-Establish-Courts-to-Handle-Disputes>.

Fabamise, Olajide. "Assessing Efforts To Revive Nigeria's Textile Industry." January 8, 2019. <https://leadership.ng/2019/01/08/assessing-efforts-to-revive-nigerias-textile-industry/>.

Fairtrade International. "Cocoa." <https://www.fairtrade.net/product/cocoa> (accessed December 20, 2019).

Fairtrade International. "How Fairtrade Certification Works." <https://www.fairtrade.net/about/certification> (accessed December 20, 2019).

Fairtrade International. "Nigeria Food and Bev Tec." <https://www.agrofood-nigeria.com/food-bev-tec-nigeria.html> (accessed October 14, 2019).

Falck-Zepeda, José, Guillaume Gruère, and Idah Sithole-Niang, eds. *Genetically Modified Crops in Africa: Economic and Policy Lessons from Countries South of the Sahara*. Washington: International Food Policy Research Institute, 2013. DOI: <http://dx.doi.org/10.2499/9780896297951>.

Farge, Emma, and Kwasi Kpodo. "Court Ruling Favors Ghana in Ocean Border Dispute with Ivory Coast." Reuters, September 23, 2017. <https://www.reuters.com/article/us-ghana-ivorycoast-boundary/court-ruling-favors-ghana-in-ocean-border-dispute-with-ivory-coast-idUSKCN1BY0G0>.

Faris, Stephan. "The Solar Company Making a Profit on Poor Africans." *Bloomberg*, December 2, 2015. <https://www.bloomberg.com/features/2015-mkopa-solar-in-africa/>.

Fastmarkets SPB. "Glossary of Materials and Grades of Scrap." <https://www.scrappricebulletin.com/glossary-of-prices> (accessed October 22, 2019).

Fayo, Galgallo. "Court Rules SONY Is Not a Well-known Brand in Kenya." *Business Daily Africa*, May 31, 2018. <https://www.businessdailyafrica.com/news/Court-rules-SONY-is-not-a-wellknown-brand/539546-4588024-9id6hm/index.html>.

Federal Reserve. See Board of Governors of the Federal Reserve System (Federal Reserve).

*Federal Negarit Gazeta* (Ethiopia). "Trade Mark Registration and Protection Proclamation." Proclamation 501/2006, July 2006. <http://admin.theiguides.org/Media/Documents/Trademark%20Registration%20and%20Protection%20Proclamation%20No.%205012006.pdf>.

Feed the Future Innovation Lab for Markets, Risk and Resilience. "How Agricultural Index Insurance Can Promote Risk Management and Resilience in Developing Countries." April 25, 2019. <https://basis.ucdavis.edu/agricultural-index-insurance-economic-development>.

- Fibre2Fashion. "CBN Makes Efforts to Revive Nigerian Textile-Garment Units." July 16, 2019. <https://www.fibre2fashion.com/news/textile-news/cbn-makes-efforts-to-revive-nigerian-textile-garment-units-250685-newsdetails.htm>.
- Fick, Maggie. "Ethiopia to Issue Two Telecoms Licenses, Minority Stake in Monopoly: Official." *Reuters*, July 5, 2019. <https://www.reuters.com/article/us-ethiopia-telecoms/ethiopia-to-issue-two-telecom-licenses-minority-stake-in-monopoly-official-idUSKCN1U01M8>.
- Fick, Maggie. "iROKOTv Investors Back 'Netflix of Africa' with \$19 Million Funding." *Financial Times*, January 25, 2016. <https://www.ft.com/content/b02cab5e-c378-11e5-b3b1-7b2481276e45>.
- Fick, Maggie. "Multinational Brewers Look to Tap Africa's \$13 bn Beer Market." *Financial Times*, April 18, 2017. <https://www.ft.com/content/8ded3a9e-193b-11e7-9c35-0dd2cb31823a>.
- Fick, Maggie, and David Pilling. "Nigeria Edges Closer to Devaluation with Dollar Move." *Financial Times*, February 20, 2017. <https://www.ft.com/content/cdb25ff8-f7a1-11e6-9516-2d969e0d3b65>.
- Fikadu Asfaw and Associates Law Office. "Trademark Registration Procedures under Ethiopian Law." <https://www.hg.org/legal-articles/trademark-registration-procedures-under-ethiopian-law-22978> (accessed September 20, 2019).
- Fikadu Asfaw and Associate Law Office. "Well Known Trademarks and Ethiopian Law." <https://ethiopianlaw.com/well-known-trademarks-and-ethiopian-law> (accessed September 20, 2019).
- Fikadu Asfaw and Associate Law Office. "Why and How to Protect your Trademark in Ethiopia." <https://ethiopianlaw.com/why-and-how-to-protect-your-trademark-in-ethiopia> (accessed September 20, 2019).
- Financial Times*. fDiMarkets database (accessed various dates).
- Financial Times*. fDi Markets database, "Frequently Asked Questions (FAQs)." <https://www.fdimarkets.com/faqs/> (accessed November 18, 2019).
- Finelib.com. "Cotton Producing States in Nigeria And Its Cultivation Processes." n.d. <https://www.finelib.com/about/nigeria-cash-crops/cotton-producing-states-in-nigeria-and-its-cultivation-processes/109> (accessed November 12, 2019).
- Finistere Ventures. "2018 Agtech Investment Review." December 6, 2018. <https://pitchbook.com/news/articles/finistere-ventures-2018-agtech-investment-review>.
- FINN. "Rwanda Pioneers Regulatory Framework for Drones with Zipline." <https://www.wearefinn.com/topics/posts/rwanda-pioneers-regulatory-framework-for-drones-with-zipline/> (accessed November 26, 2019).
- Fisher, Eleanor, Jon Hellin, Helen Greatrex, and Nathaniel Jensen. "Index Insurance and Climate Risk Management: Addressing Social Equity." *Development Policy Review* 37, no. 5 (2019): 581–602. <https://onlinelibrary.wiley.com/doi/full/10.1111/dpr.12387>.

Fitch Solutions. "Global E-Commerce, Index and Market Developments." 2019.

<https://www.fitchsolutions.com/events/global-e-commerce-index-and-market-developments>.

Flame Design. "SA Film Students Crack the Online Streaming Industry." July 16, 2019.

<https://flamedesign.co.za/articles/production/sa-film-students-crack-the-online-streaming-industry/>.

Fleishman, Jeffrey. "Watch Out Hollywood, Nollywood Is Coming to Town for a Festival of African Film."

*Los Angeles Times*, March 19, 2019. <https://www.latimes.com/entertainment/movies/la-ca-nollywood-visits-hollywood-20190319-story.html>.

Fleming, Sean. "Drones Are Saving Lives in Tanzania's Remote Communities." World Economic Forum,

April 2019. <https://www.weforum.org/agenda/2019/04/drones-are-saving-lives-in-tanzania-remote-communities/>.

Food and Agriculture Organization of the United Nations (FAO). *FAO Statistical Pocketbook: Coffee 2015*.

Rome: FAO, 2015. <https://www.readkong.com/page/fao-statistical-pocketbook-coffee-2015-fao-coffee-8352039>.

Food and Agriculture Organization of the United Nations (FAO). "FAOSTAT Statistical Database."

<http://www.fao.org/faostat/en/> (accessed various dates).

Food and Agriculture Organization of the United Nations (FAO). "Methodology and Scope of the Data."

<http://www.fao.org/economic/est/issues/investment/trends/methodology-data/en/#.XiidOMg3nct> (accessed November 29, 2019).

Food and Agriculture Organization of the United Nations (FAO). "Nigeria at a Glance."

<http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/> (accessed November 12, 2019).

Food and Agriculture Organization of the United Nations (FAO). "Why Mechanization Is Important."

*Sustainable Agricultural Mechanization* (blog). <http://www.fao.org/sustainable-agricultural-mechanization/overview/why-mechanization-is-important/en/> (accessed November 11, 2019).

Foodbev Media. "Heineken Acquires South African Craft Brewery Stellenbrau." March 31, 2017.

<https://www.foodbev.com/news/heineken-acquires-south-african-craft-brewery-stellenbrau/>.

Foote, Willy. "Meet the Social Entrepreneur behind Africa's 'Uber for the Farm.'" *Forbes*, August 14,

2018. <https://www.forbes.com/sites/willyfoote/2018/08/14/meet-the-social-entrepreneur-behind-africas-uber-for-the-farm/>.

Ford. "Ford Expands Engine Assembly Operations at Struandale Engine Plant." Press release, March 27,

2018. <https://media.ford.com/content/fordmedia/fma/za/en/news/2018/03/27/ford-expands-engine-assembly-operations-at-struandale-engine-pla.html>.

Ford. "Ford's Expansion Unleashes New Potential for South Africa." Press release, June 14, 2019.

<https://media.ford.com/content/fordmedia/fma/za/en/news/2019/06/14/ford-s-expansion-unleashes-new-potential-for-south-africa.html>.

- Ford. "Ford Invests \$170 Million in South Africa to Build the All-New Everest SUV, Creating 1,200 New Jobs." Press release, April 5, 2016. <https://media.ford.com/content/fordmedia/fna/us/en/news/2016/04/05/ford-invests-170-million-in-south-africa-to-build-new-everest-suv.html>.
- Forden, Eric. "Mobile Money in Kenya." U.S. International Trade Commission. Executive Briefing on Trade, June 2015. [https://www.usitc.gov/sites/default/files/publications/332/executive\\_briefings/forden\\_mobile\\_money\\_kenya\\_june2015\\_0.pdf](https://www.usitc.gov/sites/default/files/publications/332/executive_briefings/forden_mobile_money_kenya_june2015_0.pdf).
- Fowler, Naomi. "India and the Renegotiation of Its Double Tax Agreement with Mauritius: An Update." Tax Justice Network, April 4, 2019. <https://www.taxjustice.net/2019/04/04/india-and-the-renegotiation-of-its-double-taxation-avoidance-agreement-with-mauritius-an-update/>.
- Fox, Alison. "You Can Now Fly Nonstop from the U.S. to Cape Town." Travel and Leisure, December 17, 2019. <https://www.travelandleisure.com/airlines-airports/united-airlines/united-airlines-cape-town-nyc-nonstop-service>.
- Freedom House. "Freedom in the World 2018: Ethiopia." 2018. <https://freedomhouse.org/report/freedom-world/2018/ethiopia>.
- Freedom House. "Freedom in the World 2018: Uganda." 2018. <https://freedomhouse.org/report/freedom-world/2018/zimbabwe>.
- Freedom House. "Freedom in the World 2018: Zambia." 2018. <https://freedomhouse.org/report/freedom-world/2018/ethiopia>.
- Freedom House. "Freedom in the World 2018: Zimbabwe." 2018. <https://freedomhouse.org/report/freedom-world/2018/zimbabwe>.
- Freedom House. "Freedom on the Net 2018." October 2018. <https://freedomhouse.org/report/freedom-net/freedom-net-2018>.
- Fresh Plaza. "4% Growth in 2019 Macadamia Supply below Expectation, Says International Nut Council." June 18, 2019. <https://www.freshplaza.com/article/9116941/4-growth-in-2019-macadamia-supply-below-expectation-says-international-nut-council/>.
- Friedman, Arthur. "Africa Starts to Blossom as Apparel Sourcing Destination." *Sourcing Journal*, October 11, 2018. <https://sourcingjournal.com/topics/sourcing/africa-apparel-sourcing-121305/>.
- Friedman, Arthur. "Rules of Origin Could Make or Break African Continental Free Trade Area." *Sourcing Journal*, June 28, 2019. <https://sourcingjournal.com/topics/trade/rules-of-origin-african-continental-free-trade-area-158276>.
- Frost & Sullivan. *Digitization of Energy Transmission and Distribution in Africa: The Future of Smart Energy in Sub-Saharan Countries*. Report for GE, 2018. <http://www.gegridsolutions.com/press/gepress/2018/WP-Digitization.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Fusion Nakano. "YouTube." "Netflix." User and Revenue databases. <https://fusion.nakano.com> (accessed October 25, 2019).

Gadzala, Aleksandra. "3D Printing: Shaping Africa's Future." Atlantic Council, April 2018. <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/3d-printing-shaping-africas-future/>.

Gaiachain. "Pilot Projects: Cocoa." <https://gaiachain.io/#about-section> (accessed November 21, 2019).

Gale, Fred, Constanza Valdes, and Mark Ash. *Interdependence of China, United States, and Brazil in Soybean Trade*. U.S. Department of Agriculture. Economic Research Service. Washington, DC, June 2019. <https://www.ers.usda.gov/webdocs/publications/93390/ocs-19f-01.pdf?v=3881>.

Gale, Julian. "Green & Gold Macadamias Partners with Camellia Group." IEG Vu, February 28, 2019. <https://iegvu.agribusinessintelligence.informa.com/CO225409/Green--Gold-Macadamias-partners-with-Camellia-Group>.

Gale, Julian. "Growth in 2019 Macadamia Supply Below Expectation." IEG Vu, June 3, 2019. <https://iegvu.agribusinessintelligence.informa.com/CO227633/Growth-in-2019-macadamia-supply-below-expectation>.

Gale, Julian. "Kenya Takes Steps to Raise Profile of Nuts, Grains and Oilseed Crops." IEG Vu, July 25, 2019. <https://iegvu.agribusinessintelligence.informa.com/CO228914/Kenya-takes-steps-to-raise-profile-of-nuts-grains-and-oilseed-crops>.

Gale, Julian. "Macadamia Kernels Remain Scarce." IEG Vu, June 21, 2018. <https://iegvu.agribusinessintelligence.informa.com/CO219795/Macadamia-kernels-remain-scarce>.

Gale, Julian. "Macadamia Supply Is Falling Behind Growth in Demand." IEG Vu, July 6, 2017. <https://iegvu.agribusinessintelligence.informa.com/CO182188/Macadamia-supply-is-falling-behind-growth-in-demand>.

Garcia, Tonya. "5 Things about Newly-Public African E-commerce Site Jumia." MarketWatch, April 14, 2019. <https://www.marketwatch.com/story/african-e-commerce-site-jumia-is-going-public-5-things-to-know-ahead-of-its-ipo-2019-03-19>.

Gartner. "Gartner Says Worldwide IaaS Public Cloud Services Market Grew 31.3% in 2018." News release, July 29, 2019. <https://www.gartner.com/en/newsroom/press-releases/2019-07-29-gartner-says-worldwide-iaas-public-cloud-services-market-grew-31point3-percent-in-2018>.

Gbenga, Ajifowoke Michael. "Uganda Counting the Costs of Its Regressive Social Media Tax." Ventures Africa, December 11, 2019. <http://venturesafrica.com/uganda-counting-the-costs-of-its-regressive-social-media-tax/>.

Gebrehiwot, Berihu Assefa. "Trade Policy in Ethiopia, 1991–2006." Chap. 14 in *The Oxford Handbook of the Ethiopian Economy*, edited by Fantu Cheru, Christopher Cramer, and Arkebe Oqubay. Oxford: Oxford University Press, 2019.

- Gebreselassie, Masresha (EGS). "Africa Continues to Face Challenges To Reach Full Potential." Just-Style, October 15, 2018. [https://www.just-style.com/analysis/africa-continues-to-face-challenges-to-reach-full-potential\\_id134720.aspx](https://www.just-style.com/analysis/africa-continues-to-face-challenges-to-reach-full-potential_id134720.aspx).
- General Electric Company (GE). "Re-imagining the Future of Power in Sub-Saharan Africa." May 2019. [https://www.ge.com/content/dam/gepower-pw/global/en\\_US/documents/regions/africa/Re-imagining%20the%20future%20of%20power%20in%20Sub-Saharan%20Africa\\_Digital.pdf](https://www.ge.com/content/dam/gepower-pw/global/en_US/documents/regions/africa/Re-imagining%20the%20future%20of%20power%20in%20Sub-Saharan%20Africa_Digital.pdf).
- General Motors (GM). "General Motors and Isuzu Motors Announce Future Plans for Operations in South Africa." Press release, May 18, 2017. [https://media.gm.com/media/za/en/gm/news.detail.html/content/Pages/news/za/en/2017/may/18\\_05\\_2017\\_General\\_Motors\\_and\\_Isuzu\\_Motors\\_Announce\\_Future\\_Plans\\_for\\_Operations\\_in\\_South\\_Africa.html](https://media.gm.com/media/za/en/gm/news.detail.html/content/Pages/news/za/en/2017/may/18_05_2017_General_Motors_and_Isuzu_Motors_Announce_Future_Plans_for_Operations_in_South_Africa.html).
- General Motors (GM). "GM Awards R6 Billion Export Programme to Local Unit." June 27, 2013. [http://www.gmcyukonmedia.com/media/za/en/gm/news.detail.html/content/Pages/news/za/en/2013/jun/27\\_06\\_gm\\_export\\_programme.html](http://www.gmcyukonmedia.com/media/za/en/gm/news.detail.html/content/Pages/news/za/en/2013/jun/27_06_gm_export_programme.html).
- Generic and Biosimilars Medicines South Africa (GBMSA). "Members." <https://gbmsa.org/members/> (accessed February 5, 2020).
- George, Libby. "Nigeria's NNPC Says It Paid Debts Owed to Mobil Producing Nigeria." Reuters, July 3, 2019. <https://www.reuters.com/article/us-nigeria-oil/nigerias-nnpc-says-it-paid-debts-owed-to-mobil-producing-nigeria-idUSKCN1TY2T9>.
- George, Libby. "Nigeria to Cut Sulfur in Fuels a Year after U.N. Deadline." Reuters, March 13, 2018. <https://uk.reuters.com/article/us-nigeria-fuels-sulphur/nigeria-to-cut-sulfur-in-fuels-a-year-after-u-n-deadline-idUKKCN1GP1HQ?rpc=401&>.
- George, Micheal W. "Gold." *Mineral Commodity Summaries* (various years). Reston, VA: U.S. Geological Survey, January 2016 to February 2019. <https://www.usgs.gov/centers/nmic/gold-statistics-and-information>.
- Gereffi, Gary, and Karina Fernandez-Stark. *Global Value Chain Analysis : A Primer*. May 31, 2011. [https://www.researchgate.net/publication/265892395\\_Global\\_Value\\_Chain\\_Analysis\\_A\\_Primer](https://www.researchgate.net/publication/265892395_Global_Value_Chain_Analysis_A_Primer)
- Gérout, Guillaume, Jamie MacLeod, and Melaku Desta. "The AfCFTA as Yet Another Experiment towards Continental Integration." Chap. 2 in *Inclusive Trade in Africa*, edited by David Luke and Jamie MacLeod. New York, NY: Routledge, 2019. <https://www.routledge.com/Inclusive-Trade-in-Africa-The-African-Continental-Free-Trade-Area-in-Comparative/Luke-Macleod/p/book/9781138394520>.
- Gilmer, Bill. "Proximity Counts: How Houston Dominates the Oil Industry." *Forbes*, August 22, 2018. <https://www.forbes.com/sites/uhenergy/2018/08/22/proximity-counts-how-houston-dominates-the-oil-industry/#416a0ad56107>.
- Gilroy, Annie. "What's Next for Sibanye after the Aquarius Platinum Acquisition?" Yahoo Finance, April 28, 2016. <https://finance.yahoo.com/news/next-sibanye-aquarius-platinum-acquisition-150731005.html>.

- Glencore. *Responsibly Sourcing the Commodities for Everyday Life: Annual Report 2018*. <https://www.glencore.com/dam/jcr:b4e6815b-3a2c-43ca-a9ef-ef606bb3c1/glen-2018-annual-report.pdf> (accessed September 18, 2019).
- Global Environmental Facility (GEF) and United Nations Development Programme (UNDP). *Options and Opportunities to Make Food Value Chains More Environmentally Sustainable and Resilient in Sub-Saharan Africa*, September 5, 2017. <https://www.thegef.org/publications/options-and-opportunities-make-food-value-chains-more-environmentally-sustainable-and>.
- Global Index Insurance Facility (GIIF). "Agriculture and Climate Risk Enterprise (ACRE): Kilimo Salama—Kenya, Rwanda, Tanzania." *Partner Profiles*, World Bank Group, n.d. <http://documents.worldbank.org/curated/en/858031490693709582/pdf/113740-BRI-PartnerProfiles-ACRE-PUBLIC.pdf> (accessed October 11, 2019).
- GlobalStats. "Search Engine Market Share." <https://gs.statcounter.com/search-engine-market-share> (accessed November 19, 2019).
- Global Trading & Agency (GTA). "Latest News: Macadamia." May 16, 2019. <https://www.globaltrading.nl/news-slug/macadamia-may-16-2019/>.
- Goedde, Lutz, Amandla Ooko-Ombaka, and Gillian Pais. "Winning in Africa's Agricultural Market." McKinsey & Company, 2019. <https://www.mckinsey.com/industries/agriculture/our-insights/winning-in-africas-agricultural-market>.
- Goga, Sha'ista, Anthea Paelo, and Julius Nyamwena. *Online Retailing in South Africa*. Center for Competition, Regulations and Economic Development (CCRED), March 2019. <https://static1.squarespace.com/static/52246331e4b0a46e5f1b8ce5/t/5cd008fcb208fc5e822f92c2/1557137668486/IDTT+2+eCommerce+1+Research+Report+2.pdf>.
- Golan, Edahn. "The US Jewelry Market Is Much Smaller Than You Think." Diamond Research & Data, September 4, 2018. <http://edahngolan.com/jewelry-market-is-much-smaller-than-you-think/>.
- Goldman Sachs. "Precision Farming: Cheating Malthus with Digital Agriculture." Profiles in Innovation, July 13, 2016. <https://www.goldmansachs.com/insights/pages/precision-farming.html> (registration needed).
- Goldstein Research. "African Pharmaceutical Market: Industry Analysis and Forecast 2017-2030." June 2019. <https://www.goldsteinresearch.com/report/africa-pharmaceutical-industry-market-size-forecast> (registration needed).
- Golub, Stephen S. "Entrepôt Trade and Smuggling in West Africa: Benin, Togo and Nigeria." *World Economy* 35, no. 9 (September 2012): 1139–61. Originally published online July 23, 2012. <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9701.2012.01469.x/abstract> (fee required).
- Goretti, Manuela, and Hans Weisfeld. "Trade in the WAEMU: Development and Reform Opportunities." International Monetary Fund Working Paper WP/08/68, March 2008. <https://www.imf.org/external/pubs/ft/wp/2008/wp0868.pdf>.

- Government of Botswana. *National AGOA Response Strategy for Botswana*, September 1, 2017. <https://agoa.info/images/documents/15259/national-agoa-response-strategy-for-botswana.pdf>.
- Government of China. Ministry of Finance. Taxation Committee Announcement [2018] No. 5. “Announcement of the Customs Tariff Commission of the State Council on Adding Tariffs to Imports of US\$50 Billion.” June 16, 2018. [http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201806/t20180616\\_2930325.html](http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201806/t20180616_2930325.html) (Google translated).
- Government of Côte d’Ivoire. Autorité de Régulation des Télécommunications de Côte d’Ivoire ( Telecommunications Regulatory Agency of Côte d’Ivoire)(ARTCI). *Acts and Ordinances*. <http://www.artci.ci/index.php/en/laws-and-ordinances/Laws-and-Rulings/acts-and-ordinances.html> (accessed October 16, 2019).
- Government of Côte d’Ivoire. *Loi No 2013-450 du 19 Juin 2013 Relative à la Protection des Données à Caractère Personnel*, June 2013. [https://www.unodc.org/res/cld/document/civ/loi-no-2013-450-relative-a-la-protection-des-donnees-a-caractere-personnel.html/06192013\\_loi\\_donne\\_es\\_personnelles.pdf](https://www.unodc.org/res/cld/document/civ/loi-no-2013-450-relative-a-la-protection-des-donnees-a-caractere-personnel.html/06192013_loi_donne_es_personnelles.pdf).
- Government of Ethiopia. Ministry of Trade. *Ethiopia National AGOA Response Strategy Draft*, October 2013 (published November 25, 2015). <https://agoa.info/images/documents/5946/agoa-national-strategy-draft.pdf>.
- Government of Ghana. Data Protection Commission. “Data Protection Act, 2012 (ACT 843).” <https://www.dataprotection.org.gh/data-protection/data-protection-acts-2012> (accessed December 27, 2019).
- Government of Kenya. Central Bank of Kenya. “Number of ATMs, ATM Cards, and POS Machines.” <https://www.centralbank.go.ke/national-payments-system/payment-cards/number-of-atms-atm-cards-pos-machines/> (accessed August 26, 2019).
- Government of Kenya. Communications Authority of Kenya. *2016–2017 Annual Report*, 2017. <https://ca.go.ke/document/annual-report-for-the-financial-year-2016-2017/>.
- Government of Kenya. “eCitizen: A Portal That Offers Access to Information.” <https://www.ecitizen.go.ke/ecitizen-services.html> (accessed December 19, 2019).
- Government of Kenya. Kenya Airports Authority (KAA). “Kenya Airways Starts Non-stop Daily Flights to New York.” <https://www.kaa.go.ke/kenya-airways-starts-non-stop-daily-flight-to-new-york/#targetText=The%20airline%20will%20operate%20its,06%3A25%20the%20following%20ay> (accessed August 20, 2019).
- Government of Kenya. Ministry of Trade and Commerce (MITC). *Kenya—National AGOA Strategy 2018–2023*, July 30, 2018. <https://agoa.info/images/documents/15490/kenyanationalagoastrategy2018-2023.pdf>.

- Government of Kenya. National Treasury. “2017 Budget Policy Statement.” November 2016. <http://treasury.go.ke/component/jdownloads/send/172-budget-policy-statement/459-2017-budget-policy-statement.html>.
- Government of Kenya. Parliament. *The Data Protection Bill, 2019*, 2019. <http://www.parliament.go.ke/sites/default/files/2019-07/The%20Data%20Protection%20Bill%2C%202019.pdf>.
- Government of Kenya. State Department for Trade. Ministry of Industry, Trade, and Cooperatives (MITC). *Kenya National AGOA Strategy and Action Plan 2018–2023*, 2018. [https://www.eatradehub.org/kenya\\_national\\_agoa\\_strategy\\_2018](https://www.eatradehub.org/kenya_national_agoa_strategy_2018).
- Government of Malawi. Ministry of Industry and Trade. Department of Policy and Planning. *Strategic Plan 2011–16*, September 2011. <http://www.moit.gov.mw/index.php/policies-strategies-regulations/policies-strategies>.
- Government of Malawi. Ministry of Industry, Trade, and Tourism. *National African Growth and Opportunity Act (AGOA) Response Strategy and Action Plan for Malawi*, October 2018. <https://agoa.info/images/documents/15624/agoa-country-strategy-malawi.pdf>.
- Government of the Netherlands. Netherlands Enterprise Agency. Centre for the Promotion of Imports from developing countries (CBI). “Exporting Macadamia Nuts to Europe.” <https://www.cbi.eu/market-information/processed-fruit-vegetables-edible-nuts/macadamia-nuts/> (accessed October 25, 2019).
- Government of the Netherlands. “South African Healthcare Sector.” <https://www.netherlandsandyou.nl/your-country-and-the-netherlands/south-africa/about-us/key-topics/south-african-healthcare-sector> (accessed September 9, 2019).
- Government of Nigeria. National Biosafety Management Agency Act 2015. [https://www.nbma.gov.ng/wp-content/uploads/2017/06/National\\_Biosafety\\_Management\\_Agency\\_Act\\_2015-signed.pdf](https://www.nbma.gov.ng/wp-content/uploads/2017/06/National_Biosafety_Management_Agency_Act_2015-signed.pdf) (accessed February 14, 2020).
- Government of Nigeria, National Biosafety Management Agency. “Function.” <https://nbmagov.ng/function/> (accessed February 28, 2020)
- Government of Nigeria. Nigerian Copyright Commission (NCC). *Draft Copyright Bill 2015*. Abuja, Nigeria: NCC, 2015. [http://graduatedresponse.org/new/wp-content/uploads/2016/02/DRAFT\\_COPYRIGHT\\_BILL\\_NOVEMBER-2015.pdf](http://graduatedresponse.org/new/wp-content/uploads/2016/02/DRAFT_COPYRIGHT_BILL_NOVEMBER-2015.pdf).
- Government of Nigeria. Nigerian Copyright Commission (NCC). *Nigerian Copyright Act: Cap 28 Laws of the Federation of Nigeria, 2004*. Abuja, Nigeria: NCC, 2004. [http://www.cosonng.com/nigerian-copyright\\_act.pdf](http://www.cosonng.com/nigerian-copyright_act.pdf).
- Government of Nigeria. Nigeria Information Technology Development Agency (NITDA). *Nigeria Data Protection Regulation 2019*, 2019. <https://nitda.gov.ng/wp-content/uploads/2019/01/Nigeria%20Data%20Protection%20Regulation.pdf>.

- Government of Nigeria. Nigeria Information Technology Development Agency (NITDA). *Guidelines for Nigerian Content Development in ICT 2014 (as amended August 2019)*, 2019. <https://nitda.gov.ng/wp-content/uploads/2019/08/GNCFinale22.pdf>.
- Government of Rwanda. Ministerial Order Determining License Fees for Special Economic Developers/operators in Rwanda. *Official Gazette no. 11*, March 12, 2012. <https://businessprocedures.rdb.rw/media/Ministerial%20order%20Number%2013-2012%20of%2020-02-2012%20determining%20licence%20fees%20for%20Special%20Economic%20Zones%20developers%20-%20operators%20in%20Rwanda.pdf>.
- Government of Rwanda. Ministry of Information Technology and Communications (MITEC). *ICT Sector Strategic Plan (2018–2024): Towards Digital Enabled Economy*, November 2017. [https://minict.gov.rw/fileadmin/Documents/Mitec2018/Policies\\_Publication/Strategy/ICT\\_SECTOR\\_STRATEGIC\\_PLAN\\_2018-2024 .pdf](https://minict.gov.rw/fileadmin/Documents/Mitec2018/Policies_Publication/Strategy/ICT_SECTOR_STRATEGIC_PLAN_2018-2024.pdf).
- Government of Rwanda. Ministry of Information Technology and Communications (MITEC). “Smart Rwanda Master Plan.” n.d. <https://www.minict.gov.rw/policies-publications/strategy/> (accessed November 15, 2019).
- Government of Rwanda. Ministry of Trade and Industry. *Rwanda AGOA Action Plan*, April 2016. <https://agoa.info/images/documents/6212/rwanda-agoa-strategyr.pdf>.
- Government of South Africa. BBBEE Commission website. <https://www.bbbee.commission.co.za/legislation-2/> (accessed March 13, 2020).
- Government of South Africa. Competition Commission of South Africa. Market Inquiry into the LPG Sector, March 2017. <http://www.compcom.co.za/lpg-inquiry/>.
- Government of South Africa. Department of Communications (DOC). “Local Content to Move Automotive Industry Forward.” SA News, November 23, 2018. <https://www.sanews.gov.za/south-africa/local-content-move-automotive-industry-forward>.
- Government of South Africa. Department of Government Communication and Information System. “Statement of the Cabinet Meeting of 23 May 2018.” May 24, 2018. <https://www.gcis.gov.za/newsroom/media-releases/statement-cabinet-meeting-23-may-2018>.
- Government of South Africa. Department of Health. “National Health Insurance.” [www.health.gov.za/index.php/nhi](http://www.health.gov.za/index.php/nhi) (accessed September 9, 2019).
- Government of South Africa. Department of Trade and Industry. *Intellectual Property Policy of the Republic of South Africa Phase I*, June 2018. [http://www.thedti.gov.za/news2018/IP\\_Policy2018-Phase I.pdf](http://www.thedti.gov.za/news2018/IP_Policy2018-Phase_I.pdf).
- Government of South Africa. Department of Justice. *Protection of Personal Information Act, 2013*. <http://www.justice.gov.za/infocreg/docs/InfoRegSA-POPIA-act2013-004.pdf>.

Government of South Africa. *Films and Publications Amendment Act 11 of 2019*.

<https://www.gov.za/documents/films-and-publications-amendment-act-11-2019-3-oct-2019-0000>.

Government of South Africa. *Patents Act No. 57 of 1978*. <https://www.gov.za/documents/patents-act-9-apr-2015-0827>.

Government of South Africa. Province of Western Cape. Western Cape Department of Agriculture Drought Portal. “Another Year of Efficient Farming via Satellite Data!” <http://www.elsenburg.com/drought/?p=1259> (accessed December 5, 2019).

Government of South Africa. Province of Western Cape. Western Cape Government (WESGRO). “The Future of the Western Cape Agricultural Sector in the Context of the 4th Industrial Revolution.” 2019. <https://www.usb.ac.za/wp-content/uploads/2018/07/THE-FUTURE-OF-THE-WC-AGRICULTURAL-SECTOR-IN-THE-CONTEXT-OF-4IR-FINAL-REP.pdf>.

Government of Tanzania. Ministry of Home Affairs. Immigration Department. “Entry Requirements and Visa Information.” <https://www.immigration.go.tz/index.php/en/services/visa-information> (accessed September 30, 2019)

Government of Togo. Ministry of Trade and Private Sector Development. *Operational Action Plan for the Short and Medium Term Use of AGOA*, August 31, 2017. <https://agoa.info/images/documents/15334/togo.pdf>.

Government of the United Kingdom. Department of International Trade. “Guidance: Overseas Business Risk—Ethiopia.” May 2018. <https://www.gov.uk/government/publications/overseas-business-risk-ethiopia/overseas-business-risk-ethiopia>.

Government of the United Kingdom. “Modern Slavery.” <https://www.gov.uk/government/collections/modern-slavery-bill> (accessed March 13, 2020).

Government of the United Kingdom (UK). *Transparency in Supply Chains*, 2019. <https://www.gov.uk/government/consultations/transparency-in-supply-chains>.

Government of the United Kingdom. “*Transparency in Supply Chains: A Practical Guide*.” December 18, 2019. <https://www.gov.uk/government/publications/transparency-in-supply-chains-a-practical-guide/transparency-in-supply-chains-a-practical-guide>.

Government of Zambia. Ministry of Commerce, Trade and Industry. *National African Growth and Opportunity Act (AGOA) Response Strategy and Action Plan for Zambia*, June 14, 2018. <https://agoa.info/images/documents/15453/national-agoa-response-strategy-for-zambia-2018.pdf>.

Graff, Gregory D., and David Zilberman. “Venture Capital and the Transformation of Private R&D for Agriculture and Food.” In *Economics of Research and Innovation in Agriculture*, edited by Petra Moser. University of Chicago Press, 2019.

- Graff, Gregory D., Felipe de Figueiredo Silva, and David Zilberman. "Venture Capital and the Transformation of Private R&D for Agriculture: A First Look." In *Economics of Research and Innovation in Agriculture*. NBER Chapters. National Bureau of Economic Research, Inc, 2019. <https://ideas.repec.org/h/nbr/nberch/14298.html>.
- Greatrex, Helen, James Hansen, Samantha Garvin, Rahel Diro, Margot Le Guen, Sari Blakeley, Kolli Rao, and Daniel Osgood. *Scaling Up Index Insurance for Smallholder Farmers: Recent Evidence and Insights*. CCFAS Report No. 14. Copenhagen: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCFAS), 2015. <https://ccafs.cgiar.org/publications/scaling-index-insurance-smallholder-farmers-recent-evidence-and-insights#.Xgt08Uc3ncs>.
- Green & Gold Macadamias. *Macadamias on the Rise*. Market report, May 2019. <https://gfnc.co.za/wp-content/uploads/2019/06/Green-and-Gold-Macadamias-Market-Report-May-2019.pdf>.
- Green & Gold Macadamias. "Macadamias—The Ultimate Healthy Fat." News release, June 12, 2018. <https://www.greenandgoldmacadamias.com/2018/12/06/macadamias-the-ultimate-healthy-fat/>.
- Green Farms Nut Company. "Planning for the Long Game: Macadamia Trees Are a 20 Year Investment." September 2018. <https://www.agtag.co.za/category/14/post/20862September>.
- Griffiths, James. "The global internet is powered by vast undersea cables. But they're vulnerable." CNN, July 26, 2019. <https://www.cnn.com/2019/07/25/asia/internet-undersea-cables-intl-hnk/index.html>.
- Groupe Banque Sahélo-Saharienne pour l'Investissement et le Commerce (Sahel-Sahara Bank for Investment and Commerce Group) (Groupe BSIC). "Le Groupe." <http://www.bsicbank.com/cotedivoire/?-Groupe-BSIC-#1> (accessed October 8, 2019).
- Grubler, Julia, Mahdi Ghodsi, and Robert Stehrer. "Assessing the Impact of Non-Tariff Measures on Imports." CEPR, February 2016. [https://www.banque-france.fr/sites/default/files/8\\_julia\\_grubler-2016-06-20.pdf](https://www.banque-france.fr/sites/default/files/8_julia_grubler-2016-06-20.pdf).
- GSMA. "% Mobile Broadband." <https://www.gsmaintelligence.com/markets/1283/dashboard/> (accessed November 19, 2019).
- GSMA. *The Mobile Economy: Sub-Saharan Africa 2017, 2017*. <https://www.gsmaintelligence.com/research/?file=7bf3592e6d750144e58d9dcfac6adfab&download>.
- GSMA. *The Mobile Economy: Sub-Saharan Africa 2019, 2019*. <https://gsma.com/mobileeconomy/sub-saharan-africa/>.
- GSMA. "Person-to-Government Payment Digitization: Lessons from Kenya." September 2017. [https://gsma.com/mobilefordevelopment/wp-content/uploads/2017/09/P2G\\_Report\\_Final.pdf](https://gsma.com/mobilefordevelopment/wp-content/uploads/2017/09/P2G_Report_Final.pdf).
- GSMA. "Tower Power Africa: Energy Challenges and Opportunities." November 26, 2014. [https://www.gsma.com/mwg-internal/de5fs23hu73ds/progress?id=3VQ7\\_tHtpkVmQ8lcYr2CTbe97CS2oSzoks7NVcbbEO8,&dl](https://www.gsma.com/mwg-internal/de5fs23hu73ds/progress?id=3VQ7_tHtpkVmQ8lcYr2CTbe97CS2oSzoks7NVcbbEO8,&dl).

- Guardian* (Nigeria). "5 Made-in-Nigeria Cars You Would Love to Drive." April 13, 2018. <https://guardian.ng/features/5-made-in-nigeria-cars-you-would-love-to-drive/>.
- Gupta, Manav. *Blockchain for Dummies*. 3rd ed. IBM, 2018. [https://www.ibm.com/blockchain/what-is-blockchain?p1=Search&p4=p50370596442&p5=e&cm\\_mmc=Search\\_Google\\_-1S\\_1S\\_-WW\\_NA\\_-blockchain%20for%20dummies\\_e&cm\\_mmca7=71700000061222563&cm\\_mmca8=aud-309367918490:kwd-299322752093&cm\\_mmca9=CjwKCAiA98TxBRBtEiwAVRLquytaAeFiWmXaAKXqjteSznz8mp6k5k7yNNTcuwBRDkQnavcvW7oubBoC7e0QAvD\\_BwE&cm\\_mmca10=406205800046&cm\\_mmca11=e&gclid=CjwKCAiA98TxBRBtEiwAVRLquytaAeFiWmXaAKXqjteSznz8mp6k5k7yNNTcuwBRDkQnavcvW7oubBoC7e0QAvD\\_BwE&gclsrc=aw.ds](https://www.ibm.com/blockchain/what-is-blockchain?p1=Search&p4=p50370596442&p5=e&cm_mmc=Search_Google_-1S_1S_-WW_NA_-blockchain%20for%20dummies_e&cm_mmca7=71700000061222563&cm_mmca8=aud-309367918490:kwd-299322752093&cm_mmca9=CjwKCAiA98TxBRBtEiwAVRLquytaAeFiWmXaAKXqjteSznz8mp6k5k7yNNTcuwBRDkQnavcvW7oubBoC7e0QAvD_BwE&cm_mmca10=406205800046&cm_mmca11=e&gclid=CjwKCAiA98TxBRBtEiwAVRLquytaAeFiWmXaAKXqjteSznz8mp6k5k7yNNTcuwBRDkQnavcvW7oubBoC7e0QAvD_BwE&gclsrc=aw.ds).
- Gupta, Neha. "Inside PayPal's African Expansion Plan." *Market Realist*, March 14, 2019. <https://articles2.marketrealist.com/2019/03/inside-paypals-african-expansion-plan/>.
- Gupta, V.B., and Z. Bashir. "PET Fibers, Films, and Bottles." Chap. 7 in *Handbook of Thermoplastic Polyesters*, edited by Stoyko Fakirov. Weinheim, Germany: Wiley-VCH, 2002.
- Gutierrez, Jose. "China Plans to Be the World's Key Macadamia Supplier." *IEG Vu*, November 9, 2018. <https://iegvu.agribusinessintelligence.informa.com/CO223064/China-plans-to-be-the-worlds-key-macadamia-supplier>.
- Gutierrez, Jose. "Lower Chinese Demand Should Calm Macadamia Market." *IEG Vu*, December 14, 2018. <https://iegvu.agribusinessintelligence.informa.com/CO223863/Lower-Chinese-demand-should-calm-macadamia-market>.
- Gutierrez, Jose. "Strong South African Macadamia Crop due to Weather and New Orchards." *IEG Vu*, March 5, 2019. <https://iegvu.agribusinessintelligence.informa.com/CO225521/Strong-South-African-macadamia-crop-due-to-weather-and-new-orchards>.
- H. Niang-Consulting and Government of Mali, Ministère du Commerce et de l'Industrie. *Stratégie Nationale AGOA du Mali* (Mali's national AGOA strategy), June 15, 2016. <https://agoa.info/images/documents/6187/strategie-agoa-mali.pdf>.
- Hao, Karen. "The Future of AI Research Is in Africa." *MIT Technology Review*, June 21, 2019. <https://www.technologyreview.com/s/613848/ai-africa-machine-learning-ibm-google/>.
- Harley, Loksan. "African Countries Relax Short-Term Visa Policies for Chinese in Sign of Increased Openness to China." Migration Policy Institute, August 2019. <https://www.migrationpolicy.org/article/african-countries-relax-short-term-visa-policies-chinese>.
- Hartzenberg, Trudi. "Regional Integration in Africa." World Trade Organization Economic Research and Statistics Division. Staff Working Paper ERSD-2011-14, October 2011. [https://www.wto.org/english/res\\_e/reser\\_e/ersd201114\\_e.pdf](https://www.wto.org/english/res_e/reser_e/ersd201114_e.pdf).
- Harvest Choice. "Cotton." n.d. <http://harvestchoice.org/commodities/cotton> (accessed November 12, 2019).

- Hassan Emmanuel, Ohid Yaqub, and Stephanie Diepeveen. "Intellectual Property and Developing Countries: A Review of the Literature." Technical Report TR-804-IPO, Rand Corporation, 2010. [https://www.rand.org/pubs/technical\\_reports/TR804.html](https://www.rand.org/pubs/technical_reports/TR804.html).
- Hattingh, Damian, Acha Leke, and Bill Russo. "Lions (Still) on the Move: Growth in Africa's Consumer Sector." McKinsey & Company, October 2017. <https://www.mckinsey.com/industries/consumer-packaged-goods/our-insights/lions-still-on-the-move-growth-in-africas-consumer-sector>.
- Hawkes, Rebecca. "Sub Saharan Africa's OTT Market Shines." RapidTV News, January 14, 2019. <https://www.rapidtvnews.com/2019011454751/sub-saharan-africa-s-ott-market-shines.html#axzz61Om0a0C3>.
- Hazell, Peter, Jamie Anderson, Niels Balzer, A. Hastrup Clemmensen, Ulrich Hess, and Francesco Rispoli. *The Potential for Scale and Sustainability in Weather Index Insurance for Agriculture and Rural Livelihoods*. World Food Programme (WFP) and International Fund for Agricultural Development (IFAD), 2010. <https://www.ifad.org/documents/38714170/40239486/The+potential+for+scale+and+sustainability+in+weather+index+insurance+for+agriculture+and+rural+livelihoods.pdf/7a8247c7-d7be-4a1b-9088-37edee6717ca>.
- Hecht, Andrew. "Cocoa Has Been Edging Higher." Seeking Alpha, October 9, 2019. <https://seekingalpha.com/article/4295593-cocoa-edging-higher>.
- Heineken N.V., *Annual Report 2018*, 2019. <https://www.theheinekencompany.com/-/media/Websites/TheHEINEKENCompany/Downloads/PDF/Annual-Report-2018/Heineken-NV-2018-Annual-Report-F.ashx>.
- Hellenic Shipping News. "TNPA to Prioritise Ship Repairs, Oil and Gas Facilities at Cape Town, Saldanha Ports." September 12, 2018. <https://www.hellenicshippingnews.com/tnpa-to-prioritise-ship-repairs-oil-and-gas-facilities-at-cape-town-saldanha-ports/>.
- Hello Tractor. "About Us." <https://www.hellotractor.com/about-us/> (accessed November 27, 2019).
- Henderson, Roxanne, and Loni Prinsloo. "JPMorgan Hiring in Africa as More Firms Seek London Listings." Bloomberg, July 17, 2019. <https://www.bloomberg.com/news/articles/2019-07-17/jpmorgan-hiring-in-africa-as-more-firms-seek-london-listings>.
- Henry, Nzekwe. "After Cameroon, Jumia Abandons Yet Another African Market." Weetracker, November 28, 2019. <https://weetracker.com/2019/11/28/jumia-quits-tanzania/>.
- Herald* (Zimbabwe). "Willowvale Motor Industries Reopens. Over 5 000 Jobs to Be Created. Firm to Produce 3 000 Units in 3 Years." March 28, 2017. <https://www.herald.co.zw/willowvale-motor-industries-reopens-%E2%80%A2-over-5-000-jobs-to-be-created-%E2%80%A2-firm-to-produce-3-000-units-in-3-years/>.
- HeraldLIVE (South Africa). "Motor, Catalytic Converter Firms Hold Breath for End to Dispute." June 13, 2014. <https://www.heraldive.co.za/business/2014-06-13-motor-catalytic-converter-firms-hold-breath-for-end-to-dispute/>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Hetzner, Christiaan. "VW Invests \$20 Million in Rwanda's First Car Plant." *Automotive News Europe*, June 27, 2018. <https://europe.autonews.com/article/20180627/ANE/180629816/vw-invests-20-million-in-rwanda-s-first-car-plant>.
- Hicks, Tyler. "In Nigeria, Chinese Investment Comes with a Downside." *New York Times*, December 5, 2015. <https://www.nytimes.com/2015/12/06/business/international/in-nigeria-chinese-investment-comes-with-a-downside.html>.
- Hilyard, Joseph F. *The Oil and Gas Industry: A Nontechnical Guide*. Tulsa, OK: PennWell, 2012.
- Hjort, Jonas, and Jonas Poulsen. *The Arrival of Fast Internet and Employment in Africa*. NBER Working Paper No. 23582, revised January 2018. <https://www.nber.org/papers/w23582>.
- Hootsuite. "Digital 2019, Nigeria." February 3, 2019. <https://www.slideshare.net/DataReportal/digital-2019-nigeria-january-2019-v01>.
- Hootsuite. "Digital 2019, South Africa." February 3, 2019. <https://www.slideshare.net/DataReportal/digital-2019-south-africa-january-2019-v01>.
- Hong, Zhao. "Study on Promoting the Competitiveness of Beijing Economy by the Development of Headquarters Economy." Beijing Social Science Institute, March 2005. [http://en.cnki.com.cn/Article\\_en/CJFDTotal-BJSK200503006.htm?UID=WEEvREcwSIJHSlDTEYzVTFPV2k1dEp4Q1BuSjE5eFcrTIBGRm8vOHhGOD0%3d%249A4hF\\_YAuvQ5obgVAqNKPCYcEjKensW4IQMovwHtwkF4VYPoHbKxJw!!&autoLogin=1](http://en.cnki.com.cn/Article_en/CJFDTotal-BJSK200503006.htm?UID=WEEvREcwSIJHSlDTEYzVTFPV2k1dEp4Q1BuSjE5eFcrTIBGRm8vOHhGOD0%3d%249A4hF_YAuvQ5obgVAqNKPCYcEjKensW4IQMovwHtwkF4VYPoHbKxJw!!&autoLogin=1).
- Hope, Ashley, and Puseletso Sauli. "Africa and the WTO's E-Commerce Agenda." Tralac blog, January 19, 2018. <https://www.tralac.org/blog/article/12598-africa-and-the-wto-s-e-commerce-agenda.html>.
- Hoy, Kate. "Smart Kigali: An IoT Project to Transform Rwanda." IDG Connect, May 26, 2017. <https://www.idgconnect.com/idgconnect/interviews/1012547/smart-kigali-iot-project-transform-rwanda>.
- Hsu, Jeremy. "Africa's Delivery Drones Are Zipping Past the US." *Wired*, September 13, 2017. <https://www.wired.com/story/africas-delivery-drones-are-zipping-past-the-us/>.
- Hunter, Archie, and Julian Luk. "DRC Bans Cobalt, Copper Concentrate Exports, Cutting off Zambia Trade." *Fastmarkets MB*, March 20, 2019. <https://www.fastmarkets.com/article/3864886/exclusive-drc-bans-cobalt-copper-concentrate-exports-cutting-off-zambia-trade>.
- Hunter, Archie, Julian Luk, and Charlotte Radford. "DRC U-turns on Cobalt, Copper Concentrate Export Ban." *Fastmarkets MB*, March 21, 2019. <https://www.metalbulletin.com/Article/3865124/DRC-U-turns-on-cobalt-copper-concentrate-export-ban-says-could-reimpose.html>.
- Hyde, Peace. "The Fortune and Fury Behind Nollywood." *Forbes Africa*, January 30, 2018. <https://www.forbesafrica.com/life/2018/01/30/fortune-fury-behind-nollywood/>.

- Hydrocarbons Technology. "Trans Saharan Gas Is the Longest Planned Pipeline in EMEA." April 3, 2018. <https://www.hydrocarbons-technology.com/comment/trans-saharan-gas-longest-planned-pipeline-emea/> (accessed September 16, 2019).
- Ibam, Emmanuel Onwuka. "E-commerce in Africa: The Case of Nigeria." *EAI Endorsed Transactions on Serious Games* 4, no. 15 (January 2018). [https://www.researchgate.net/publication/322318869\\_e-Commerce\\_in\\_Africa\\_The\\_Case\\_of\\_Nigeria](https://www.researchgate.net/publication/322318869_e-Commerce_in_Africa_The_Case_of_Nigeria).
- IBISWorld. *Global Candy and Chocolate Manufacturing*, 2018. <https://www.ibisworld.com/global/market-research-reports/global-candy-chocolate-manufacturing-industry/>.
- IBISWorld. *Semiconductor and Circuit Manufacturing in the U.S.*, 2019. <https://www.ibisworld.com/united-states/market-research-reports/semiconductor-circuit-manufacturing-industry/>.
- IBM. "Akamai Content Delivery Network Now Available to Enterprises on the IBM Cloud." Press release, October 9, 2017. <https://www-03.ibm.com/press/us/en/pressrelease/53281.wss>.
- IBM. "IBM Food Trust." <https://www.ibm.com/blockchain/solutions/food-trust> (accessed October 15, 2019).
- IBM. "IBM Report: Technology Holds the Key to Economic and Social Reform in Accra, Ghana." Press release, April 11, 2013. <https://newsroom.ibm.com/2013-04-11-IBM-Report-Technology-Holds-the-Key-to-Economic-and-Social-Reform-in-Accra-Ghana,1>.
- IBM. "What Is Blockchain Technology?" <https://www.ibm.com/blockchain/what-is-blockchain> (accessed October 15, 2019).
- IBM. "What Is the Internet of Things?" November 17, 2016. <https://www.ibm.com/blogs/internet-of-things/what-is-the-iot/>.
- Ibukun, Yinka. "Volkswagen, Nissan to Get Tax Breaks for Plants in Ghana." Bloomberg, August 15, 2019. <https://www.bloomberg.com/news/articles/2019-08-15/volkswagen-nissan-to-get-10-year-tax-breaks-for-ghana-plants>.
- IDH. "How We're Making a Difference for Cocoa Farmers and Cooperatives in Côte d'Ivoire." 2018. <https://www.idhsustainabletrade.com/publication/how-idh-is-making-a-difference-for-cocoa-farmers-and-cooperatives-in-cote-divoire/>.
- IHS Markit. "Drones and Blockchain: New Approaches to Increasing Vaccine Coverage and Access to Medicines in Low-Income Countries." October 31, 2019.
- IHS Markit. *Global Trade Atlas database*. <https://ihsmarkit.com/products/maritime-global-trade-atlas.html> (accessed various dates).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- IHS Markit. "Polyethylene Terephthalate (PET) Solid-State Resins." *Chemical Economics Handbook*, March 2018. <https://ihsmarkit.com/products/polyethylene-terephthalate-resins-chemical-economics-handbook.html> (fee required; summary available).
- IHS Markit. "Storage Bullets Arrive for Richards Bay's New LPG Terminal." *Dredging and Port Construction*, September 23, 2019. <https://dredgingandports.com/news/2019/storage-bullets-arrive-for-richards-bays-new-lpg-terminal/>.
- Ihuoma, Chidinma. "NFVCB Clamps Down on Pornographic, Unclassified Film Vendors in Lagos." *Nigerian Express*, July 24, 2019. <https://www.theexpressng.com/2019/07/24/nfvcb-clamps-down-on-pornographic-unclassified-film-vendors-in-lagos/>.
- Ilado, Lucy. "Kenyan CMOs Under Fire over Royalty Payments." *Music Africa*, August 16, 2019. <https://www.musicinafrica.net/magazine/kenyan-cmos-under-fire-over-royalty-payments>.
- IndustriALL. "100 Jobs Lost as Nigeria's Textile Sector Continues to Decline." April 13, 2018. <http://www.industriall-union.org/100-jobs-lost-as-nigerias-textile-sector-continues-to-decline>.
- Industrial Parks Development Corporation (IPDC) (Ethiopia). "About Us." <http://www.ipdc.gov.et/index.php/en/about-us> (accessed November 1, 2019).
- Industrial Parks Development Corporation (IPDC) (Ethiopia). "Our Parks." <http://www.ipdc.gov.et/index.php/en/industrial-parks> (accessed February 6, 2020).
- Innovative Pharmaceutical Association of South Africa (IPASA). "Membership" (accessed September 9, 2019). <https://ipasa.co.za/members-2/>.
- Innovative Pharmaceuticals Association of South Africa (IPASA). "Narrative Submission on the 2017 Draft Intellectual Property Policy—Phase 1." November 17, 2017. <http://ipasa.co.za/wp-content/uploads/2017/12/Revised-Draft-IP-Policy-IPASA-Narrative-Submission-171117.pdf>.
- Institute of International Education. Places of Origin Dataset. <https://p.widencdn.net/5e914r/International-Students-Places-of-Origin> (accessed February 6, 2020).
- Insurance Journal*. "Africa Re Joins World Bank's IFC to Build Crop Insurance Market for Nigeria's Farmers." March 29, 2019. <https://www.insurancejournal.com/news/international/2019/03/29/522258.htm>.
- Intellectual Property Watch (IP Watch). "Legislation for South Africa's Next IP Policy Likely after Elections Next Year." June 11, 2018. <https://www.ip-watch.org/2018/06/11/legislation-south-africas-new-ip-policy-likely-elections-next-year/>.
- Intergovernmental Authority on Development (IGAD). "About CEWARN." <https://cewarn.org/index.php/about-cewarn> (accessed September 30, 2019).
- Intergovernmental Authority on Development (IGAD). "About Us." <https://igad.int/about-us> (accessed various dates, 2019).

- Intergovernmental Authority on Development (IGAD). “What We Do.” <https://igad.int/about-us/what-we-do> (accessed September 30, 2019).
- International Air Transport Association (IATA). “Air Cargo Demand Continues Negative 2019 Trend.” May 29, 2019. <https://www.iata.org/pressroom/pr/Pages/2019-05-29-01.aspx>.
- International Center for Trade and Sustainable Development (ICTSD). “How Should Africa Engage in E-commerce and the Digital Economy?” *Bridges Africa*, March 14, 2018. <https://www.ictsd.org/bridges-news/bridges-africa/news/how-should-africa-engage-in-e-commerce-and-the-digital-economy>.
- International Coffee Organization (ICO). *Coffee Market Report*, August 2019. <http://www.ico.org/documents/cy2018-19/cmr-0819-e.pdf>.
- International Coffee Organization (ICO). *Value Addition in the African Coffee Sector*. 120th Session of the International Coffee Council, Yamoussoukro, Côte d’Ivoire, September 28–29, 2017. <http://www.ico.org/documents/cy2016-17/icc-120-7e-african-coffee-sector.pdf>.
- International Data Corporation (IDC). “IDC 2016 Version 4—Cloud Services.” *Worldwide Black Book*, March 2017 (fee required). [https://www.idc.com/getfile.dyn?containerId=IDC\\_P336&attachmentId=47358676](https://www.idc.com/getfile.dyn?containerId=IDC_P336&attachmentId=47358676).
- International Data Corporation (IDC). “IoT Spending in the Middle East and Africa to See Double-Digit Growth over Coming Years.” July 25, 2019. <https://www.idc.com/getdoc.jsp?containerId=prMETA45400219>.
- International Democracy Watch (IDW). “Central African Economic and Monetary Union.” <http://www.internationaldemocracywatch.org/index.php/central-african-economic-and-monetary-community> (accessed September 30, 2019).
- International Fertilizer Association. “Fertilizer Outlook 2019–2023.” IFA Annual Conference. Montreal: International Fertilizer Association, June 13, 2019.
- International Labour Organization (ILO). “A Partnership to Combat Child Labour in the Chocolate and Cocoa Industry: Public-Private Partnership.” 2015. [https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/exrel/documents/publication/wcms\\_409581.pdf](https://www.ilo.org/wcmsp5/groups/public/-/dgreports/-/exrel/documents/publication/wcms_409581.pdf).
- International Labour Organization (ILO). “Fake Goods: Arrests and Seizures in Worldwide Operations.” July 12, 2018. <https://www.interpol.int/es/Noticias-y-acontecimientos/Noticias/2018/Fake-goods-arrests-and-seizures-in-worldwide-operations>.
- International Labour Organization (ILO). “Rooting Out Child Labour from cocoa Farms.” Paper No. 4, 2007. <http://www.ilo.org/ipeinfo/product/download.do?type=document&id=6447>.
- International Monetary Fund (IMF). Exports and Imports by Areas and Countries data. Direction of Trade Statistics database. <https://data.imf.org/regular.aspx?key=61013712> (accessed December 20, 2019).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

International Monetary Fund (IMF). "Financial Access Survey 2018." 2018.

<https://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C>.

International Monetary Fund (IMF). "Fintech and Financial Services: Initial Considerations." Discussion Note, June 2017. <https://www.imf.org/~media/Files/Publications/SDN/2017/sdn1705.ashx>.

International Monetary Fund (IMF). *Fintech: The Experience So Far*, June 2019.

<https://www.imf.org/~media/Files/Publications/PP/2019/PPEA2019024.ashx>.

International Monetary Fund (IMF). "Mobile Money Note 2019," 2019.

<https://data.imf.org/?sk=E5DCAB7E-A5CA-4892-A6EA-598B5463A34C>.

International Monetary Fund (IMF). "Nigeria: Out of Recession and Looking Beyond Oil." *IMF News*, March 15, 2018. <https://www.imf.org/en/News/Articles/2018/03/15/na031518-nigeria-out-of-recession-and-looking-beyond-oil>.

International Monetary Fund (IMF). *Regional Economic Outlook: Sub-Saharan Africa Recovery amid Elevated Uncertainty*. Washington, DC: IMF, April 2019.

<https://www.imf.org/en/Publications/REO/SSA/Issues/2019/04/01/sreo0419>.

International Monetary Fund (IMF). World Economic Outlook Database. "Gross domestic product, constant prices." <https://www.imf.org/en/Publications/SPROLLs/world-economic-outlook-databases#sort=%40imfdate%20descending> (accessed January 9, 2020).

International Monetary Fund (IMF). World Economic Outlook Database. "Inflation Rate, Average Consumer Prices." October 2019.

<https://www.imf.org/external/datamapper/PCPIPCH@WEO/GHA>.

International Nut and Dried Fruit Council (INC). "Macadamia Roundtable." PowerPoint presentation, 2018.

[https://nutfruitcongress.org/sevilla2018/files/pagina/1527082600\\_Macadamia\\_Roundtable\\_PowerPoint\\_4\\_May.pdf](https://nutfruitcongress.org/sevilla2018/files/pagina/1527082600_Macadamia_Roundtable_PowerPoint_4_May.pdf).

International Nut and Dried Fruit Council (INC). *NutFruit Magazine*, November 2017.

<https://www.nutfruit.org/industry/publications/inc-magazine> (registration needed).

International Nut and Dried Fruit Council (INC). *NutFruit Magazine*, November 2018.

<https://www.nutfruit.org/industry/publications/inc-magazine> (registration needed).

International Nut and Dried Fruit Council (INC). *NutFruit Magazine*, July 2019.

<https://www.nutfruit.org/industry/publications/inc-magazine> (registration needed).

International Nut and Dried Fruit Council (INC). *Nuts and Dried Fruits: Statistical Yearbook 2018/2019*, March 2019.

[https://www.nutfruit.org/files/tech/1553521370\\_INC\\_Statistical\\_Yearbook\\_2018.pdf](https://www.nutfruit.org/files/tech/1553521370_INC_Statistical_Yearbook_2018.pdf).

International Organization of Vehicle Manufacturers (OICA), "2018 Production Statistics."

<http://www.oica.net/category/production-statistics/2018-statistics/> (accessed September 9, 2019).

- International Organization of Vehicle Manufacturers (OICA). "Motorization Rate 2015—Worldwide." <http://www.oica.net/category/vehicles-in-use/> (accessed July 25, 2019).
- International Organization of Motor Vehicle Manufacturers (OICA). "Sales Statistics." <http://www.oica.net/category/sales-statistics/> (accessed September 12, 2019).
- International Plant Biotechnology Outreach (IPBO). "Cotton in Africa." <http://ipbo.vib-ugent.be/publications/fact-series/cotton-in-africa> (accessed December 3, 2019).
- International Platinum Group Metals Association (IPGMA). "Member Companies." <https://ipa-news.com/index/about-us/member-companies.html> (accessed September 16, 2019).
- International Criminal Police Organization (INTERPOL). "Fake Goods: Arrests and Seizures in Worldwide Operations." News release, July 12, 2018. <https://www.interpol.int/en/News-and-Events/News/2018/Fake-goods-arrests-and-seizures-in-worldwide-operations>.
- International Post Corporation (IPC). "State of E-commerce: Global Outlook 2016–21." 2017. <https://www.ipc.be/sector-data/e-commerce/articles/global-ecommerce-figures-2017>.
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "Biotech Country Facts and Trends: South Africa." n.d. [http://www.isaaa.org/resources/publications/biotech\\_country\\_facts\\_and\\_trends/download/Facts%20and%20Trends%20-%20South%20Africa-2017.pdf](http://www.isaaa.org/resources/publications/biotech_country_facts_and_trends/download/Facts%20and%20Trends%20-%20South%20Africa-2017.pdf) (accessed November 12, 2019).
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "Brief 53: Global Status of Commercialized Biotech/GM Crops: 2017." 2018. <http://www.isaaa.org/resources/publications/briefs/53/default.asp>.
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "Brief 54: Global Status of Commercialized Biotech/GM Crops: 2018." 2019. <http://www.isaaa.org/resources/publications/briefs/54/>.
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "Bt Cotton Approved for Planting in Kenya." *Crop Biotech Update*, December 19, 2019. <http://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=17902>.
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "GM Crop Approvals." *GM Approval Database, GMO Database*. <http://www.isaaa.org/gmapprovaldatabase/default.asp> (accessed July 8, 2019).
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "Nigeria Commercializes Pod Borer Resistant Cowpea, Its First GM Food Crop." *Crop Biotech Update*, December 18, 2019. <http://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=17899>.
- International Service for the Acquisition of Agri-biotech Applications (ISAAA). "Pocket K No. 6: Bt Insect Resistant Technology." October 2018. <https://www.isaaa.org/resources/publications/pocketk/6/default.asp>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- International Telecommunications Union (ITU). "Focus Group on Smart Sustainable Cities." <http://www.itu.int/en/ITU-T/focusgroups/ssc/Pages/default.aspx> (accessed December 2, 2019).
- International Telecommunications Union (ITU). "ICT Price Baskets (IPB)." <https://www.itu.int/net4/ITU-D/ipb/#ipbtimeseries-tab> (accessed September 19, 2019).
- International Telecommunications Union (ITU). "Key ICT Indicators for Developed and Developing Countries and the World (Totals and Penetration Rates." Rev. November 27, 2018. [https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2018/ITU\\_Key\\_2005-2018\\_ICT\\_data\\_with%20LDCs\\_rev27Nov2018.xls](https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2018/ITU_Key_2005-2018_ICT_data_with%20LDCs_rev27Nov2018.xls).
- International Telecommunications Union (ITU). *Measuring the Information Society Report 2015*. Geneva: International Telecommunications Union, 2015. <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2015.aspx>.
- International Telecommunication Union (ITU). *Smart Sustainable Cities: An Analysis of Definitions*. ITU-T Focus Group on Smart Sustainable Cities, October 2014. [https://www.itu.int/en/ITU-T/focusgroups/ssc/Documents/website/web-fg-ssc-0100-r9-definitions\\_technical\\_report.docx](https://www.itu.int/en/ITU-T/focusgroups/ssc/Documents/website/web-fg-ssc-0100-r9-definitions_technical_report.docx).
- International Telecommunications Union (ITU). "Statistics." [https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2018/ITU\\_Key\\_2005-2018\\_ICT\\_data\\_with%20LDCs\\_rev27Nov2018.xlsa](https://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2018/ITU_Key_2005-2018_ICT_data_with%20LDCs_rev27Nov2018.xlsa) (accessed September 19, 2019).
- International Telecommunications Union (ITU). *World Telecommunications/ICT Indicators Database, 2018*. <https://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx> (fee required).
- International Trade Advisory Commission of South Africa (ITAC). "Draft Guidelines for the Application of a DAFF Quota Allocation Import Permit for U.S. Chicken." October 2015. <http://www.itac.org.za/upload/Draft%20Guidelines%20US%20Chicken%20SAPA%20AGOA%2030%20Oct%202015.pdf>.
- International Trade Center (ITC). *International E-commerce in Africa: The Way Forward*, 2015. [http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/International%20E-Commerce%20in%20Africa\\_Low-res.pdf](http://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/International%20E-Commerce%20in%20Africa_Low-res.pdf).
- International Trade Centre (ITC) and African Cotton and Textiles Industries Federation (ACTIF). *COMESA Regional Strategy for Cotton-to-Clothing Value Chain*. June 2009. [https://unctad.org/en/PublicationsLibrary/suc2017\\_Regional\\_COMESA\\_Strategy.pdf](https://unctad.org/en/PublicationsLibrary/suc2017_Regional_COMESA_Strategy.pdf).
- International Trade Centre (ITC) and World Economic Forum (WEF). *Africa E-Commerce Agenda: Roadmap for Action*, September 2019. [http://www3.weforum.org/docs/WEF\\_Africa\\_EComm\\_EN.pdf](http://www3.weforum.org/docs/WEF_Africa_EComm_EN.pdf).
- International Trademark Association. "Comments on Draft Intellectual Property Policy of the Federal Democratic Republic of Ethiopia." October 2018.

- Intrado Research and Markets. “African Transport Network Projects, 2019—\$430.3Bn Investment Value, with Focus on Road, Railway and Bridges.” Globe Newswire news release, July 9, 2019. <https://www.globenewswire.com/news-release/2019/07/09/1879924/0/en/African-Transport-Network-Projects-2019-430-3Bn-Investment-Value-with-Focus-on-Road-Railway-and-Bridges.html>.
- Isaac, Nkechi. “Nigeria Commercializes Bt Cotton, Its First GMO Crop.” Cornell Alliance for Science, July 30, 2018. <https://allianceforscience.cornell.edu/blog/2018/07/nigeria-commercializes-bt-cotton-first-gmo-crop/>.
- Isaac, Nkechi. “Nigeria Moves to Revive Its Textile Industry.” Cornell Alliance for Science, April 9, 2019. <https://allianceforscience.cornell.edu/blog/2019/04/nigeria-moves-revive-textile-industry/>.
- Islam, Asif, Silvia Muzi, and Jorge Luis Rodriguez Meza. “Does Mobile Money Increase Firms’ Investment?” World Bank Policy Research Working Paper 7890, November 2016. <https://ideas.repec.org/p/wbk/wbrwps/7890.html>.
- IT News Africa. “The Future of E-commerce in Africa.” February 12, 2019. <https://www.itnewsafrika.com/2019/02/the-future-of-e-commerce-in-africa/>.
- IT News Africa. “Jumia Building Tomorrow’s African Infrastructure.” June 20, 2018. <https://www.itnewsafrika.com/2018/06/jumia-building-tomorrows-african-e-commerce-infrastructure/>.
- IT News Africa. “Smart transportation—an African game changer.” June 21, 2018. <https://www.itnewsafrika.com/2018/06/smart-transportation-an-african-game-changer/>.
- Iturrioz, Ramiro. “Agricultural Insurance.” Primer Series on Insurance, Issue 12. Washington, DC: World Bank, November 2009.
- Iwenjora, Fred. “The Big Rip-Off: How Nollywood Films Are Shown on Net Free of Charge.” *Vanguard*, October 27, 2007. <https://allafrica.com/stories/200710290187.html>.
- J.M. Smuckers Company. *Fiscal Year 2019 Annual Report*, 2019. <https://www.jmsmucker.com/smuckers-annual-report>.
- Jedlowski, Alessandro. “African Media and the Corporate Takeover: Video Film Circulation in the Age of Neoliberal Transformations.” *African Affairs* 116, no. 465 (2017): 671–91. <https://doi.org/10.1093/afraf/adx017>.
- Jedlowski, Alessandro. “From Nollywood to Nollywood: Processes of Transnationalization in the Nigerian Video Film Industry.” In *Global Nollywood: The Transnational Dimensions of the African Video Film Industry*, edited by Matthias Krings and Onookome Okome, 25–45. Bloomington, IN: Indiana University Press, 2013.
- Jediowski, Alessandro. “What Netflix’s Involvement in Nigeria’s Massive Film Industry Really Means.” *Mail & Guardian* (South Africa), January 3, 2019. <https://mg.co.za/article/2019-01-03-what-netflixs-involvement-in-nigerias-massive-film-industry-really-means>.

- Johnson, Steve. "Experts Size Up Nigeria's Prospects." *Financial Times*, November 20, 2018. <https://www.ft.com/content/fcb35c2-c703-11e8-86e6-19f5b7134d1c>.
- Jumia. "Jumia Reports Third Quarter 2019 Results." Press release. Business Wire, November 12, 2019. <https://www.businesswire.com/news/home/20191112005469/en/Jumia-Reports-Quarter-2019-Results>.
- Kah, Muhammadou M.O. "Africa Is Leapfrogging into Digital Agriculture." *Africa Renewal*. United Nations Department of Global Communications. <https://www.un.org/africarenewal/web-features/africa-leapfrogging-digital-agriculture> (accessed November 12, 2019).
- Kanamugire, Johnson. "Rwanda Moves to Revive Bus Internet Service." *East African* (Kenya), April 8, 2018. <https://www.theeastafrican.co.ke/rwanda/Business/Rwanda-moves-to-revive-bus-Internet-service/1433224-4375672-1u4jf7/index.html>.
- Kaplan, Marcia. "Africa: An Emerging Ecommerce Market with Many Challenges." *Practical E-commerce*, June 13, 2018. <https://www.practicalecommerce.com/africa-emerging-ecommerce-market-many-challenges>.
- Karashani, Bob. "Air Tanzania Expansion on Course as Country Receives Dreamliner." *The EastAfrican*, October 26, 2019. <https://www.theeastafrican.co.ke/business/Atcl-expansion-on-course-as-country-gets-dreamliner/2560-5325716-11yrthnz/index.html>.
- Karombo, Tawanda. "Regulators Have Blown Up Bitcoin Trade in Africa's Most Active Crypto Currency Market." *Quartz Africa*, May 15, 2018. <https://qz.com/africa/1278272/bitcoin-in-zimbabwe-has-been-banned-by-reserve-bank/>.
- Karombo, Tawanda. "Zimbabwe Banned the US Dollar from Being Used So Local Bitcoin Demand Is Soaring Again." *Quartz Africa*, July 10, 2019. <https://qz.com/africa/1662753/bitcoin-crypto-soar-in-zimbabwe-again-after-us-dollar-ban/>.
- Kazeem, Yomi. "A \$170 Million Funding Round Is the Latest Big-ticket Fintech Deal in Africa." *Quartz Africa*, April 8, 2019. <https://qz.com/africa/1589587/africa-fintech-branch-raises-170-million-in-series-c-round/>.
- Kazeem, Yomi. "Africa Is the World's Fastest-Growing Continent for Software Developers." *Quartz Africa*, November 7, 2019. <https://qz.com/africa/1743569/africa-is-the-fastest-growing-continent-for-developers-globally/>.
- Kazeem, Yomi. "E-commerce Is Thriving in Africa despite Hurdles to the 'Last Mile.'" *Quartz Africa*, December 13, 2018. <https://qz.com/africa/1492628/africa-e-commerce-libya-tops-online-shopping/>.
- Kazeem, Yomi. "Jumia is Shipping Bigger Losses but Its Plans to Build an African Fintech Leader Are On Pace." *Quartz Africa*, November 13, 2019. <https://qz.com/africa/1747032/jumia-is-losing-millions-but-pivoting-to-fintech-with-jumia-pay/>.

- Kazeem, Yomi. "Jumia Wants to Spin Off Its Payments Business as It Struggles to Stem Mounting Losses." Quartz Africa, August 22, 2018. <https://qz.com/africa/1692200/jumia-targets-extra-revenues-through-jumia-pay-fintech-app/>.
- Kazeem, Yomi. "Netflix Is Finally Investing in Original African Content." *Quartz Africa*, December 3, 2018. <https://qz.com/africa/1482172/netflix-will-commission-original-african-shows/>.
- Kazeem, Yomi. "Netflix is Finally Rolling Out More Servers So Fewer Africans Will 'Netflix and Buffer.'" Quartz Africa, October 16, 2016. <https://qz.com/africa/811003/a-new-netflix-server-in-nigeria-will-deliver-faster-streaming-and-content-to-its-african-users/>.
- Kazeem, Yomi. "Only one in four Nigerians applying to university will get a spot." Quartz Africa, February 22, 2017. <https://qz.com/africa/915618/only-one-in-four-nigerians-applying-to-university-will-get-a-spot/>.
- Kazeem, Yomi. "The Never-Ending Congestion at Nigeria's Largest Port Is Starting to Get Very Expensive." Quartz Africa, December 20, 2018. <https://qz.com/africa/1486768/apapa-port-congestion-causing-traffic-costing-businesses/>.
- Kazeem, Yomi. "Nigeria Has Now Been in Recession for Five Quarters—but There May Be Light at the End of the Tunnel." *Quartz Africa*, May 23, 2017. <https://qz.com/africa/989805/nigerias-economy-has-been-in-recession-for-the-fifth-consecutive-quarter/>.
- Kazeem, Yomi. "Nigerians Are Spending Half a Billion Dollars to School in the United States." Quartz Africa, November 25, 2019. <https://qz.com/africa/1755266/nigerians-spend-half-a-billion-dollars-to-school-in-the-us/>.
- Kazeem, Yomi. "Startup Investment in Africa." *Quartz Africa*, January 11, 2019. <https://qz.com/africa/1520173/african-startups-funding-in-2018-broke-records/>.
- Kell, Georg. "The Remarkable Rise of ESG." *Forbes*, July 11, 2018. <https://www.forbes.com/sites/georgkell/2018/07/11/the-remarkable-rise-of-esg/#6b07c9541695>.
- Kennedy, John. "The Future of AI: Why Google Is Betting Big on Africa." Silicon Republic, February 19, 2019. <https://www.siliconrepublic.com/machines/africa-ai-google>.
- Kenya Airways. "Kenya Airways Fleet." <https://www.kenya-airways.com/plan-and-book/kq-fleet/en/> (accessed October 21, 2019).
- Khachaturian, Tamar. "Foreign Infrastructure Service Firms in Sub-Saharan Africa." U.S. International Trade Commission. Executive Briefing on Trade, December 2014. [https://www.usitc.gov/publications/332/executive\\_briefings/khachaturian\\_ebot\\_foreign\\_aec\\_firms\\_in\\_ssa\\_december172014.pdf](https://www.usitc.gov/publications/332/executive_briefings/khachaturian_ebot_foreign_aec_firms_in_ssa_december172014.pdf).
- Khiaonarong, Tanai. "Oversight Issues in Mobile Payments." IMF Working Paper, July 2014. <https://www.imf.org/external/pubs/ft/wp/2014/wp14123.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Kielmas, Maria. "The Types of Metals Used in the Oil and Gas Industry." *Smallbusiness.chron.com*. <https://smallbusiness.chron.com/types-metals-used-oil-gas-industry-55352.html> (accessed various dates).
- Kimenyi, Mwangi. *AGOA Utilization 101*. Brookings Institution, March 23, 2015. <https://www.brookings.edu/blog/africa-in-focus/2015/03/23/agoa-utilization-101/>.
- King, Neil. "National Automotive Industry Development Plan (NAIDP) Drives Car Sales to Record Levels in Nigeria." *Euromonitor International*, July 22, 2014. <https://blog.euromonitor.com/national-automotive-industry-development-plan-naidp-drives-car-sales-to-record-levels-in-nigeria/>.
- Kirin Holdings. "Kirin Beer University Report Global Beer Consumption by Country in 2017." December 20, 2018. [https://www.kirinholdings.co.jp/english/news/2018/1220\\_01.html](https://www.kirinholdings.co.jp/english/news/2018/1220_01.html).
- Kombo Ndubi, Erick. "Uhuru Kenyatta's Effort to Place Kenya among Top Automakers in Africa." *Tuko*, March 21, 2019. <https://www.tuko.co.ke/301176-uhuru-kenyattas-effort-place-kenya-top-automakers-africa.html#301176>.
- KPMG. "Commodity Insights Bulletin—Chromite." November 2018. <https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/11/kpmg-commodity-insights-bulletin-chromite.pdf>.
- KPMG. "Consolidation of the Paints and Coatings Market." *Chemicals Magazine*, 2018. <https://home.kpmg/xx/en/home/insights/2018/03/industry-update-2018.html>.
- Krueger, Anne O. "Financial Markets and Economic Growth." *International Monetary Fund*, September 29, 2006. <https://www.imf.org/en/News/Articles/2015/09/28/04/53/sp092806>.
- Kruger, Andreas. "What Happened to South African Airways' Boeing 737 Aircraft?" *Simple Flying*. October 19, 2019. <https://simpleflying.com/south-african-airways-boeing-737/>.
- Kumar, Megha. "How Cloud Services and the Microsoft Ecosystem will Create 165,000 New Jobs in South Africa through 2022." *International Data Corporation (IDC)*, April 2018 (fee required).
- Kuo, Lily. "African Countries Want to Turn Their Poor, Overcrowded Urban Centers into 'Smart Cities.'" *Quartz Africa*, July 6, 2017. <https://qz.com/africa/998970/kigalis-vision-city-and-lagos-eko-atlantic-are-among-several-smart-city-initiatives-taking-off-in-africa/>.
- Kuwonu, Franck. "OPINION: Nigeria's 'New Oil' Export Is Beating the Charts." *Independent Online, Business Report*, May 28, 2018. <https://www.iol.co.za/business-report/opinion/opinion-nigerias-new-oil-export-is-beating-the-charts-15194513>.
- Lammey, Mark. "BP, BHGE Raising Efficiency with Help of 'Digital Twins.'" *Energy Voice*, May 9, 2018. <https://www.energyvoice.com/oilandgas/north-sea/180839/bp-bhge-bring-digital-twins-to-life/>.
- Lamprecht, Norman. *Automotive Export Manual 2019*, 2019. <https://www.abrbuzz.co.za/publications/press-and-customers/naamsa/AutomotiveExportManual2019.pdf>.

- Lawani Mikairu. "Delta Launches Nonstop Flight from Lagos to New York-JFK." *Vanguard*, April 10, 2018. <https://www.vanguardngr.com/2018/04/delta-launches-nonstop-flight-lagos-new-york-jfk/>.
- Leach, Kamaron. "Nollywood Is Ready to Go Global Thanks to Netflix." May 24, 2019. <https://www.bloomberg.com/news/articles/2019-05-24/nollywood-is-ready-to-go-global-thanks-to-netflix>.
- Lee, Isabella. "Zipline Plans to Build Drone Assembly Plant in Rwanda with Hopes of Extending Medical Drone Deliveries to More Hospitals." *UAV Coach*, November 23, 2018, <https://uavcoach.com/zipline-rwanda-assembly-plant/> (accessed July 26, 2019).
- Lee-Makiyama, Hosuk. "Threats to the E-Commerce Moratorium." Panel discussion at the 2019 Coalition of Services Industries (CSI) Global Services Summit, "Unleashing the Benefits of Services and Digital Trade." November 7, 2019.
- Lee-Mkiyama, Hosuk, and Badri Narayanan. "The Economic Losses from Ending the WTO Moratorium on Electronic Transmissions." *ECIPE Policy Brief*, August 2019. <https://ecipe.org/publications/moratorium/>.
- Leke, Acha, Mutsa Chironga, and Georges Desvaux. "The Innovations Closing Africa's Electric Power Gap." *Harvard Business Review*, January 16, 2019. <https://hbr.org/2019/01/the-innovations-closing-africas-electric-power-gap>.
- Levy-Carciente, Sary, and Lorenzo Montanari. "International Property Rights Index 2019." 2019. <https://internationalpropertyrightsindex.org/full-report>.
- Levy, Heather Pemberton. "Understand How Blockchain Will Evolve until 2030 and Today's Hype versus Reality." Gartner, October 16, 2018. <https://www.gartner.com/smarterwithgartner/the-reality-of-blockchain/>.
- Levy, Martin J. "Cape Town (South Africa): Cloudflare Data Center #113." *The Cloudflare Blog*, May 11, 2017. <https://blog.cloudflare.com/cape-town-south-africa/> (accessed September 5, 2019).
- Levy, Martin J. "Lagos, Nigeria: Cloudflare's 155th city." *The Cloudflare Blog*, October 30, 2018. <https://blog.cloudflare.com/lagos/> (accessed September 5, 2019).
- Lewis, Barbara. "Ford and IBM among Quartet in Congo Cobalt Blockchain Project." Reuters, January 16, 2019. <https://www.reuters.com/article/us-blockchain-congo-cobalt-electric/ford-and-ibm-among-quartet-in-congo-cobalt-blockchain-project-idUSKCN1PA0C8>.
- Lewis, David. "Tiny Togo Thinks Big in Pursuit of Pan-African Dream." Reuters, June 11, 2015. <https://www.reuters.com/article/us-africa-economy-togo-insight/tiny-togo-thinks-big-in-pursuit-of-pan-african-dream-idUSKBNOOR0HY20150611>.
- Lewis, Ian. "Can Brulpadda Find Deliver on High Hopes?" *Petroleum Economist*, May 23, 2019. <https://www.petroleum-economist.com/articles/politics-economics/africa/2019/can-brulpadda-find-deliver-on-high-hopes>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Lewis, Ian. "Côte d'Ivoire's Deep Ambitions." *Petroleum Economist*, September 29, 2017. <https://www.petroleum-economist.com/articles/upstream/exploration-production/2017/c%C3%B4te-divoires-deep-ambitions>.
- Lewis, Ian. "Côte d'Ivoire's Exploration Drive Rebooted." *Petroleum Economist*, January 12, 2018. <https://www.petroleum-economist.com/articles/upstream/exploration-production/2018/c%C3%B4te-d-ivoires-exploration-drive-rebooted>.
- Lewis, Ian. "Slipping Off the Radar." *Petroleum Economist*, July 13, 2016. <https://www.petroleum-economist.com/articles/politics-economics/africa/2016/slipping-off-the-radar>.
- Lewis, Ian. "Tanzania's LNG Dreams May Be Scuppered by Mistrust." *Petroleum Economist*, July 18, 2019. <https://www.petroleum-economist.com/articles/politics-economics/africa/2019/tanzanias-lng-dreams-may-be-scuppered-by-mistrust>.
- Lewis, Ian. "Tanzania Ups the Pace on LNG Project." *Petroleum Economist*, December 17, 2018. <https://www.petroleum-economist.com/articles/politics-economics/africa/2018/tanzania-ups-the-pace-on-lng-project>.
- Libelium World. "Sustainable Farming and the IoT: Cocoa Research Station in Indonesia." December 15, 2015. <http://www.libelium.com/sustainable-farming-and-the-iot-cocoa-research-station-in-indonesia/>.
- Lin, Justin, Jiajun Xu, and Sarah Hager. "Special Economic Zones and Structural Transformation in Ethiopia." Chap. 45 in *The Oxford Handbook of the Ethiopian Economy*, edited by Fantu Cheru, Christopher Cramer, and Arkebe Oqubay. Oxford: Oxford University Press, 2019.
- Lince, Tim. "Counterfeit Hotspots in Ethiopia That Brand Owners Should be Aware Of." *World Trademark Review*. October 17, 2019. <https://www.worldtrademarkreview.com/anti-counterfeiting/counterfeit-hotspots-ethiopia-brand-owners-should-be-aware>.
- Linde, Olya, Oleg Geyler, and Arthur Epstein. *The Global Diamond Industry 2018: A Resilient Industry Shines Through*. Bain & Co. and Antwerp World Diamond Center, December 5, 2018. [https://www.awdc.be/sites/awdc2016/files/bain\\_diamond\\_report\\_2018.pdf](https://www.awdc.be/sites/awdc2016/files/bain_diamond_report_2018.pdf).
- Liquid Telecom. "Our Network." [https://www.liquidtelecom.com/about-us/our\\_network](https://www.liquidtelecom.com/about-us/our_network) (accessed September 23, 2019).
- Loferski, Patricia J. "Platinum-Group Metals." *Mineral Commodity Summaries 2018*. Reston, VA: U.S. Geological Survey, January 2018. <https://www.usgs.gov/centers/nmic/platinum-group-metals-statistics-and-information>.
- Logistics Update Africa. "Cargill, IFC Partnership Launch Coop Academy 2.0 to Empower Cocoa Producing Cooperatives." Medium, September 27, 2019. <https://medium.com/@logupdateafrica/cargill-ifc-partnership-launch-coop-academy-2-0-to-empower-cocoa-producing-cooperatives-fbef9f4425a3>.
- London Bullion Market Association (LBMA). Precious Metals Prices database. <http://www.lbma.org.uk/precious-metal-prices-mobile> (accessed June 18, 2019).

- London Metal Exchange (LME). "A Detailed Guide to the London Metal Exchange." <https://www.lme.com/-/media/Files/Education-and-events/Online-resources/Brochures/Detailed-Guide-to-the-LME.pdf?la=en-GB> (accessed October 15, 2019).
- Lopez, Edwin. "IBM Takes Its Food Supply Blockchain Solution Worldwide." *Supply Chain Dive*, October 8, 2018. <https://www.supplychaindive.com/news/IBM-Food-Trust-SaaS-available-Carrefour/539065/>.
- Lorenzetti, Linda. *Cocoa Farmers Band Together for Profits*. <https://www.technoserve.org/our-work/stories/cocoa-farmers-band-together-for-profits>. (accessed October 15, 2019).
- Lu, Sheng. *2019 U.S. Fashion Industry Benchmarking Study*. U.S. Fashion Industry Association, July 2019. [http://www.usfashionindustry.com/pdf\\_files/USFIA-Fashion-Industry-Benchmarking-Study-2019.pdf](http://www.usfashionindustry.com/pdf_files/USFIA-Fashion-Industry-Benchmarking-Study-2019.pdf).
- Lucchini, Caterina. "African pharmaceutical market." *Pharma World*, November 30, 2018. <https://www.pharmaworldmagazine.com/african-pharmaceutical-market/>.
- Luke, David. "Chapter 1: Making the Case for the African Continental Free Trade Area." In *Inclusive Trade in Africa*, edited by David Luke and Jamie MacLeod. Routledge: New York, NY, 2019. <https://www.routledge.com/Inclusive-Trade-in-Africa-The-African-Continental-Free-Trade-Area-in-Comparative/Luke-Macleod/p/book/9781138394520>.
- Lynch, Michael. "What Happened to Oil Prices in 2018?" *Forbes*, January 2, 2019. <https://www.forbes.com/sites/michaelylynch/2019/01/02/what-happened-to-oil-prices-in-2018/#dc7f41a6d833>.
- MacAulay, Brad. "US Non-ferrous Exporter Work to Replace China." *AMM.com*, August 13, 2018. <https://www.amm.com/Article/3826929/US-non-ferrous-exporters-work-to-replace-China.html>.
- Malabo Montpellier Panel. "Byte by Byte: Policy Innovation for Transforming Africa's Food System with Digital Technologies." Dakar, June 2019. <https://www.mamopanel.org/resources/reports-and-briefings/byte-byte-policy-innovation-transforming-africas-f/>.
- Malabo Montpellier Panel. "Mechanized: Transforming Africa's Agriculture Value Chains." 2018. <https://www.rural21.com/english/news/detail/article/mechanized-transforming-africas-agriculture-value-chains-00002918/>.
- Malicier, Virginie, and Solomon Lanitis. "Oil Product Flows to West Africa 208,000 MT So Far in Sep: cFlow." *SP Global*, August 23, 2018. <https://www.spglobal.com/platts/en/market-insights/latest-news/shipping/082318-oil-product-flows-to-west-africa-208000-mt-so-far-in-sep-cflow>.
- Malik Chua, Jasmin. "Nigeria Seeks to Revive Cotton Industry, Fight Textiles Smuggling." *Sourcing Journal*, May 20, 2019. <https://sourcingjournal.com/topics/raw-materials/nigeria-cotton-industry-revival-152871/>.
- Marché du Film Festival de Cannes. "Marché du Film 2019: Focus World Film Market Trends." 2019.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Markets and Markets. "Catalytic Converter Market Worth \$73.1 Billion by 2025." Press release, March 15, 2019. <https://www.marketsandmarkets.com/PressReleases/catalytic-converter-systems.asp>.

MarketLine Industry Profile. "Beer and Cider in South Africa." January 2019.

MarketWatch. "Global Cocoa and Chocolate Market 2019: Global Production, Growth, Share, Demand and Segmentation Market Research Report to 2025." Press release, February 12, 2019. <https://www.marketwatch.com/press-release/global-cocoa-chocolate-market-2019-global-production-growth-share-demand-and-segmentation-market-research-report-to-2025-2019-02-12>.

MarketWatch. "Nigeria: 2018 Deadline Missed by \$12b Trans-Saharan Gas Project." Press release, March 14, 2018. <https://www.marketwatch.com/press-release/nigeria-2018-deadline-missed-by-12b-trans-saharan-gas-project-2018-03-14>.

MarketWatch. "South African Pharmaceutical Industry 2017–2019 with 88 Company Profiles, including Pfizer, Aspen and Roche." Press release, July 19, 2018. <https://www.marketwatch.com/press-release/south-african-pharmaceutical-industry-2017-2018-with-88-company-profiles-including-pfizer-aspen-and-roche---researchandmarketscom-2018-07-19>.

Markowitz, Chelsea. "The Potential for Regional Value Chains in the Automotive Sector: Can SADC Learn from the ASEAN Experience?" Johannesburg, South Africa: South African Institute of International Affairs, June 2016. <https://saiia.org.za/research/the-potential-for-regional-value-chains-in-the-automotive-sector-can-sadc-learn-from-the-asean-experience/>.

Marks, Daniel. "LNG-to-Power a Hard Nut to Crack in Africa." *Petroleum Economist*, January 2, 2019. <https://www.petroleum-economist.com/articles/politics-economics/africa/2019/lng-to-power-a-hard-nut-to-crack-in-africa>.

Marshall, Karen, John P. Gibson, Okeyo Mwai, Joram M. Mwacharo, Aynalem Haile, Tesfaye Getachew, Raphael Mrode, and Stephen J. Kemp. "Livestock Genomics for Developing Countries: African Examples in Practice." *Frontiers in Genetics* 10 (April 24, 2019): Article 297. <https://doi.org/10.3389/fgene.2019.00297>.

Massoudi, Arash, and Leila Abboud. "How Deal for SABMiller Left AB InBev with Lasting Hangover." *Financial Times*, July 24, 2019. <https://www.ft.com/content/bb048b10-ad66-11e9-8030-530adfa879c2>.

MasterCard. "Fintech Leader MasterCard Aims to Create a Cashless Africa." *Business Day*, May 13, 2019. <https://www.businesslive.co.za/bd/companies/financial-services/2019-05-13-fintech-mastercard-leader-in-fintech-aims-to-create-a-cashless-africa/>.

Mastercard. "Mastercard Acquires Oltio to Accelerate Digital Payments Adoption in Middle East and Africa." Press release, March 6, 2018. <https://newsroom.mastercard.com/press-releases/mastercard-acquires-oltio-to-accelerate-digital-payments-adoption-in-middle-east-and-africa/>.

- MasterCard. "MasterCard Partners with DPO Group to Further Boost Pan-African Merchant Payments." Press Release, December 10, 2018. <https://newsroom.mastercard.com/mea/press-releases/mastercard-partners-with-dpo-group-to-further-boost-pan-african-merchant-payments/>.
- Mastercard. "Mastercard Uses Facebook Messenger to Help Small Businesses Go Digital." Press release, February 28, 2018. <https://newsroom.mastercard.com/press-releases/mastercard-uses-facebook-messenger-help-small-businesses-go-digital/>.
- Mastercard. "Masterpass QR: Collect E-payment without POS Terminal." n.d. <https://mea.mastercard.com/en-region-mea/consumers/masterpass-africaqr.html> (accessed November 13, 2019).
- Maskus, Keith. *Intellectual Property Rights in the Global Economy*. Institute for International Economics, 2000.
- Maskus, Keith. *Parallel Imports in Pharmaceuticals: Implications for Competition and Prices in Developing Countries*. Final Report to World Intellectual Property Organization, April 2001. [https://www.wipo.int/about-ip/en/studies/pdf/ssa\\_maskus\\_pi.pdf](https://www.wipo.int/about-ip/en/studies/pdf/ssa_maskus_pi.pdf).
- Matanda, Dennis and Youssouf Kone. Foundational Document for the ECOWAS Regional Strategy for AGOA: Phase One – November To December 2017. January 29, 2018.
- Mathe, Tshegofatso. "Gwede Keeps Options Open despite Anti-Fracking Ruling." *Mail & Guardian*, July 12, 2019. <https://mg.co.za/article/2019-07-12-00-gwede-keeps-options-open-despite-anti-fracking-ruling>.
- Mathews, Charlotte. "Dim Prospects for South Africa's Refinery Sector." *Africa Oil + Gas Report*, November 16, 2018. <http://africaoilgasreport.com/2018/11/refining-gap/dim-prospects-for-south-africas-refinery-sector/>.
- Matthey, Johnson. *PGM Market Report May 2019*, May 2019. [http://www.platinum.matthey.com/documents/new-item/pgm%20market%20reports/pgm\\_market\\_report\\_may\\_19.pdf](http://www.platinum.matthey.com/documents/new-item/pgm%20market%20reports/pgm_market_report_may_19.pdf).
- Matuluko, Muyiwa. "YouTube Go–Offline First, Data-friendly YouTube Alternative–Now Available in Nigeria." Techpoint.Africa, September 18, 2017. <https://techpoint.africa/2017/09/18/YouTube-go-nigeria-launch/>.
- Mbele, Lerato. "Why M-Pesa Failed in South Africa." BBC, May 11, 2016. <https://www.bbc.com/news/world-africa-36260348>.
- McDermott, Brigid, Kaushik Malladi, Kevin Abele, and Jake Harkins. "Tomorrow's Value Chain." IBM, 2017. <https://www.ibm.com/downloads/cas/Q2RY9RN6>.
- McDonnell, Tim. "The Powerlessness of Nigeria's Tech Startups." *NPR*, November 24, 2019. <https://www.npr.org/sections/goatsandsoda/2019/11/24/781132932/the-powerlessness-of-nigerias-tech-startups>.

- McKinsey & Company. "How E-commerce Supports African Business Growth." January 2019. <https://www.mckinsey.com/featured-insights/middle-east-and-africa/how-ecommerce-supports-african-business-growth>.
- McKinsey & Company. "Insights into Pharmaceuticals and Medical Products: Africa; A Continent of Opportunity for Pharma and Patients." April 2015. <https://www.mckinsey.com/~media/mckinsey/industries/pharmaceuticals%20and%20medical%20products/our%20insights/africa%20a%20continent%20of%20opportunity%20for%20pharma%20and%20patients/pmp%20africa%20a%20continent%20of%20opportunity%20for%20pharma.ashx>.
- McKinsey Global Institute (MGI). "Lions on the Move II: Realizing the Potential of Africa's Economies." September 2016. <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Middle%20East%20and%20Africa/Realizing%20the%20potential%20of%20Africas%20economies/MGI-Lions-on-the-Move-2-Full-report-September-2016v2.ashx>.
- McNabb, Miriam. "Zipline Begins Humanitarian Drone Delivery in Rwanda." Dronelife, October 14, 2016, <https://dronelife.com/2016/10/14/zipline-drone-delivery-rwanda/>.
- Media Update. "The 'Internet Censorship' Bill: Coming Soon to South Africa." March 6, 2019. <https://www.mediaupdate.co.za/media/146337/the-internet-censorship-bill-coming-soon-to-south-africa/>.
- Medical Academic. "Generic Market Keeps Growing." February 5, 2019. <https://www.medicalacademic.co.za/news/generic-market-keeps-growing/>.
- Médecins Sans Frontières. "South Africa's New IP policy welcomes by MSF and Fix the Patent Laws." Press release, May 31, 2018. <https://www.msf.org.za/stories-news/press-releases/south-africas-new-ip-policy-welcomed-msf-and-fix-patent-laws-campaign>.
- Meemken, Eva-Marie, Jorge Sellare, Christophe N. Kouame, and Matin Qaim. "Effects of Fairtrade on the Livelihoods of Poor Rural Workers." *Nature Sustainability* 2, no. 7 (July 2019): 635–42. <https://doi.org/10.1038/s41893-019-0311-5>.
- Mehra, Rohit, Kuba Stolarski, Richard Villars, and Natalya Yezhkova. "Worldwide Cloud IT Infrastructure Hardware Spending Forecast, 2019–2020." *International Data Corporation (IDC)*, 2019 (fee required).
- Melly, Paul. "Senegal and Mauritania Projects Make Headway." *Petroleum Economist*, February 26, 2019. <https://www.petroleum-economist.com/articles/upstream/exploration-production/2019/senegal-and-mauritania-projects-make-headway>.
- Mengistu, Muhabie Mekonnen. "Multiplicity of African Regional Economic Communities and Overlapping Memberships: A Challenge for African Integration." *International Journal of Economics, Finance and Management Sciences* 3, no. 5 (2015): 417–25. <http://article.sciencepublishinggroup.com/html/10.11648.j.ijefm.20150305.12.html>.

- Mercandalli, Sara, Bruno Losch, Audrey Jolivot, Jean-Claude Lorente, Cheikh Oumar Ba, Food and Agriculture Organization of the United Nations, and CIRAD (Organization). *Rural Africa in Motion: Dynamics and Drivers of Migration South of the Sahara*. 2017. <https://reliefweb.int/sites/reliefweb.int/files/resources/a-i7951e.pdf> (accessed March 3, 2020).
- Microsoft. "Furthering Our Investment in Africa: Microsoft Opens first Africa Development Centre in Kenya and Nigeria." Press release, May 13, 2019. <https://news.microsoft.com/en-xm/features/furthering-our-investment-in-africa-microsoft-opens-first-africa-development-centre-in-kenya-and-nigeria/>.
- Mills, Richard. "Vanadium: The Metal We Can't Do Without and Don't Produce." October 24, 2017. <https://www.vanadiumprice.com/vanadium-metal-cant-without-dont-produce/>.
- Mining, Oil and Gas Services Ltd Oil & Gas (MOGS). "Sunrise Energy." <https://mogs.co.za/oil-gas-services/operations/sunrise-energy/> (accessed September 9, 2019).
- Mining Review Africa*. "Sibanye's Acquisition of Rustenburg Operations Is Now Unconditional." October 19, 2016. <https://www.miningreview.com/precious-metals/sibanyes-acquisition-is-unconditional/>.
- Mining Stock Education*. "Diamond Miners Look Poised for a Rebound." April 18, 2019. <https://www.miningstockeducation.com/2019/04/paul-zimnisky-diamond-miners-look-poised-for-a-rebound/>.
- Mining Weekly*. "South Africa Crucial to Global Chrome Supply, Chromium 2017 Hears." November 7, 2017. [https://www.miningweekly.com/article/south-africa-crucial-to-global-chrome-supply-chromium-2017-hears-2017-11-10/rep\\_id:3650](https://www.miningweekly.com/article/south-africa-crucial-to-global-chrome-supply-chromium-2017-hears-2017-11-10/rep_id:3650).
- Miriri, Duncan. "Microsoft to Spend \$100 Million on Kenya, Nigeria Tech Development Hub." *Reuters*, May 14, 2019. <https://www.reuters.com/article/us-africa-microsoft/microsoft-to-spend-100-million-on-kenya-nigeria-tech-development-hub-idUSKCN1SK1BT>.
- Mittal, Sparsh and Jeffrey S. Vetter. "A Survey of Software Techniques for Using Non-Volatile Memories for Storage and Main Memory Systems." Institute of Electrical and Electronics Engineers (IEEE), 2015. [https://www.academia.edu/12769873/A\\_Survey\\_of\\_Software\\_Techniques\\_for\\_Using\\_Non-Volatile\\_Memories\\_for\\_Storage\\_and\\_Main\\_Memory\\_Systems](https://www.academia.edu/12769873/A_Survey_of_Software_Techniques_for_Using_Non-Volatile_Memories_for_Storage_and_Main_Memory_Systems).
- Mobile Payments Today. "MasterCard Launches Masterpass QR Facebook Bot for Nigerian Merchants." March 5, 2018. <https://www.mobilepaymentstoday.com/news/mastercard-launches-masterpass-qr-facebook-bot-for-nigerian-merchants/>.
- Mohajan, Haradhan Kumar. "Food and Nutrition Scenario of Kenya." *American Journal of Food and Nutrition* 2, no. 2 (2014): 28–38.
- Mo Ibrahim Foundation. *Regional Integration Uniting to Compete*, 2014. <http://static.moibrahimfoundation.org/downloads/publications/2014/2014-facts-&-figures-regional-integration-uniting-to-compete.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Molapo, P. *The AGOA Response Strategy for Lesotho*, June 1, 2016.

<https://agoa.info/images/documents/6186/agoa-response-strategy-report-for-lesotho-2016.pdf>.

Monehin, Daniel. "Is Africa's Financial Industry Ripe for Digital Disruption?" Mastercard. Press release, May 4, 2017. <https://newsroom.mastercard.com/mea/press-releases/is-africas-financial-industry-ripe-for-digital-disruption-2/>.

Monicken, Hannah. "India, South Africa: WTO E-commerce Moratorium Too Costly for Developing Members." *InsideTrade*, June 5, 2019. <https://insidetrade.com/daily-news/india-south-africa-wto-e-commerce-moratorium-too-costly-developing-members>.

Moolman, Victor. "New Directive Will Affect Mining Vessels Off the Shore of Namibia." *Mining Weekly*, February 23, 2018. <https://m.miningweekly.com/article/new-directive-will-affect-mining-vessels-off-the-shore-of-namibian-2018-02-23>.

Morangi, Lucie. Hongjie, Liu. "Africa Looks to China for Tourism Boost." *ChinaDaily*. <http://www.chinadaily.com.cn/a/201905/29/WS5ced088a3104842260be646.html>.

Morjaria, Ameet, Sara Mason, and Angel Mario Martinez Garcia. "How the Coffee Industry Is Building a Sustainable Supply Chain in an Unstable Region." *KelloggInsight*. Kellogg School of Management at Northwestern University, August 14, 2018. <https://insight.kellogg.northwestern.edu/article/how-the-coffee-industry-is-building-a-sustainable-supply-chain-in-an-unstable-region>.

Morrison & Foerster. "IP Guidelines for Members of the Global Off-Grid Lighting Association." March 2017. [https://www.gogla.org/sites/default/files/images/gogla\\_ip\\_guidelines.pdf](https://www.gogla.org/sites/default/files/images/gogla_ip_guidelines.pdf).

Morrison, Oliver. "A Tough Nut to Crack: Macadamia Firm Explores Innovations in the Ingredient Sector." *Food Navigator*, May 15, 2019. [https://www.foodnavigator.com/Article/2019/05/15/A-tough-nut-to-crack-Macadamia-firm-explores-innovations-in-the-ingredient-sector?utm\\_source=copyright&utm\\_medium=OnSite&utm\\_campaign=copyright](https://www.foodnavigator.com/Article/2019/05/15/A-tough-nut-to-crack-Macadamia-firm-explores-innovations-in-the-ingredient-sector?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright).

Motsoeneng, Tiisetso. "MTN Scraps Mobile Money Business in South Africa." *Reuters*, September 15, 2016. <https://af.reuters.com/article/investingNews/idAFKCN11L233>.

Motsoeneng, Tiisetso, Phillip Blenkinsop, and Martinne Geller. "Beer Maker AB InBev Pumps Up the Volume in Africa." *Reuters*, May 22, 2018. <https://www.reuters.com/article/us-ab-inbev-safrica/beer-maker-ab-inbev-pumps-up-the-volume-in-africa-idUSKCN1IN0IS>.

Motta, Joshua. "Mombasa, Kenya: CloudFlare's 43rd Data Center." *The Cloudflare Blog*, August 27, 2015. <https://blog.cloudflare.com/mombasa-kenya-cloudflares-43rd-data-center/>.

Moudio, Rebecca. "Nigeria's Film Industry: A Potential Gold Mine?" *UN African Renewal*, May 2013. <http://www.un.org/africarenewal/magazine/may-2013/nigeria-s-film-industry-potential-gold-mine>.

Moscaritolo, Angela. "Google Reveals 'Equiano' Subsea Cable Project." *PCMag*, June 28, 2019. <https://www.pcmag.com/news/google-reveals-equiano-subsea-cable-project>.

- Moyo, Sam. "Family Farming in Sub-Saharan Africa: Its Contribution to Agriculture, Food Security and Rural Development." Food and Agriculture Organization of the United Nations and the International Policy Centre for Inclusive Growth of the United Nations Development Programme Working Paper, October 2016. <http://www.fao.org/3/a-i6056e.pdf>.
- Mucari, Manuel, and Mfuneko Toyana. "Exxon to Make \$500 Million Initial Investment in Mozambique LNG Project." Reuters, October 8, 2019. <https://www.reuters.com/article/us-mozambique-lng/exxon-to-make-500-million-initial-investment-in-mozambique-lng-project-idUSKBN1WN14E>.
- Muchira, Njiraina. "General Motors to Exit East Africa with Sale of Stake to Isuzu." *East African*, February 28, 2017. <https://www.theeastafrican.co.ke/business/General-Motors-exit-East-Africa-sale-stake-to-Isuzu/2560-3831344-wfiylw/index.html> (accessed September 13, 2019).
- Munarriz, Rick. "Jumia Is Not the Mercado Libre of Africa." Motley Fool, May 15, 2019. <https://www.fool.com/investing/2019/05/15/jumia-is-not-the-mercadolibre-of-africa.aspx>.
- Munshi, Neil. "Africa's Amazon Hopeful Jumia Retreats from Big Expansion." *Financial Times*, December 9, 2019. <https://www.ft.com/content/a4f6ee1e-182b-11ea-9ee4-11f260415385>.
- Munshi, Neil. "Jumia's Rise Exposes Challenges of Online Shopping In Africa." *Financial Times*, May 5, 2019. <https://www.ft.com/content/b98e9608-6a73-11e9-a9a5-351eeaf6d84>.
- Munshi, Neil. "Nigeria's President Unveils New Cabinet to Push Reforms." *Financial Times*, August 21, 2019. <https://www.ft.com/content/3175563a-c414-11e9-a8e9-296ca66511c9>.
- Munshi, Neil. "Tech Start-Ups Drive Change for Nigerian Truckers." *Financial Times*, August 26, 2019. <https://www.ft.com/content/c6a3d1f2-c27d-11e9-a8e9-296ca66511c9>.
- Murray, Sarah. "How Developing Nations Use Tech to Reach the 'Underbanked.'" *Financial Times*, April 23, 2019. <https://www.ft.com/content/0c6ddd3c-4b36-11e9-bde6-79eaea5acb64>.
- Musekiwa, John. "Maximizing Growth, Beneficiation and Value Addition of the Ferrochrome Industry." Presentation at the Zimbabwe Annual Mining Conference, May 31, 2019. <http://chamberofminesofzimbabwe.com/wp-content/uploads/2019/07/COM-AGM-Presentation-John-Musekiwa-31-May-2019-F-1.pdf>.
- Muvi Blogs. "A Look in Africa's OTT Market—Today and Tomorrow." March 22, 2017. <https://www.muvi.com/blogs/africa-ott-market-today-tomorrow.html>.
- Muyanga, Milu, T.S. Jayne, Felix Kwame Yeboah, and Nicholas Sitko. "The Rise of Medium-Scale Farms in Africa: Causes and Consequences of Changing Farm Size Distributions." Global Food Security Conference Symposium, Rome, Italy, December 3, 2017. <https://www.canr.msu.edu/resources/rise-of-medium-scale-farms-in-africa-causes-and-consequences-of-changing-farm-size-distributions-oct>.
- Mwai, Collins. "Rwanda Re-Admitted into ECCAS." *New Times* (Rwanda), May 27, 2015. <http://www.newtimes.co.rw/section/article/2015-05-27/189185/>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

MyBroadband. "Petrol Shortage Crisis Looming in South Africa." June 5, 2016.

<https://mybroadband.co.za/news/energy/167371-petrol-shortage-crisis-looming-in-south-africa-report.html>.

Myers, Anthony. "Blockchain Innovation in the Cocoa Supply Chain." *Confectionery News*, March 18, 2019. <https://www.confectionerynews.com/Article/2019/03/15/Blockchain-innovation-in-the-cocoa-supply-chain>.

Nakweya, Gilbert. "Africa Grapples with Diesel Generators' Health Problems." *SciDev.Net*, April 2, 2019. <https://www.scidev.net/sub-saharan-africa/pollution/feature/africa-grapples-with-diesel-generators-health-problems.html>.

Naspers. *Integrated Annual Report 2017*, 2017. <https://www.naspers.com/investors#Annualreports603>.

National Association of Automotive Component and Allied Manufacturers (NAACAM). "Member Search." <https://www.naacam.co.za/find-a-member> (accessed September 6, 2019).

National Association of Automotive Component and Allied Manufacturers (NAACAM). "Supply Chain Partners Collaborate." *RNEWS (South Africa)*, March 28, 2017. <https://www.rnews.co.za/article/13811/supply-chain-partners-collaborate-to-showcase-catalytic-converter-industry-at-the-2017-naacam-show>.

National Oceanic and Atmospheric Administration (NOAA). *Fisheries of the United States 2014*. Silver Spring, MD: NOAA, September 2015.

National Oceanic and Atmospheric Administration (NOAA). *Fisheries of the United States 2015*. Silver Spring, MD: NOAA, September 2016.

National Oceanic and Atmospheric Administration (NOAA). *Fisheries of the United States 2016*. Silver Spring, MD: NOAA, September 2017.

National Oceanic and Atmospheric Administration (NOAA). *Fisheries of the United States 2017*. Silver Spring, MD: NOAA, September 2018.

National Pedigree Livestock Council (NPLC). "The History of Pedigrees." <http://www.nplc.net/aws/NPLC/pt/sp/history> (accessed January 23, 2020).

Naudé, Wim. "Entrepreneurship, Education and the Fourth Industrial Revolution in Africa." *Forschungsinstitut zur Zukunft der Arbeit GmbH (Research Institute on the Future of Work) (IZA)*, IZA Discussion Paper no. 10855, June 2017. <https://www.iza.org/publications/dp/10855/entrepreneurship-education-and-the-fourth-industrial-revolution-in-africa>.

Ncube, Caroline, Tobias Schonwetter, Jeremy de Beer, and Chidi Oguamanam. "A Principled Approach to Intellectual Property Rights and Innovation in the African Free Trade Agreement." In *Inclusive Trade in Africa: The African Continental Free Trade Area in Comparative Perspective*, edited by David Luke and Jamie Macleod, 177–94. London: Taylor and Francis, 2019. <https://www.taylorfrancis.com/books/e/9780429401121>.

- NEC Corporation. "The South Atlantic Cable System ready for service - NEC completes world's first submarine cable crossing the South Atlantic." News release, October 1, 2018. [https://www.nec.com/en/press/201810/global\\_20181001\\_02.html](https://www.nec.com/en/press/201810/global_20181001_02.html).
- Neo, Pearly. "Cocoa Connectivity: Cargill Targets Further Digital Traceability Advances for Indonesia." Food Navigator Asia, July 10, 2019. [https://www.foodnavigator-asia.com/Article/2019/07/10/Cocoa-connectivity-Cargill-targets-further-digital-traceability-advances-for-Indonesia?utm\\_source=copyright&utm\\_medium=OnSite&utm\\_campaign=copyright](https://www.foodnavigator-asia.com/Article/2019/07/10/Cocoa-connectivity-Cargill-targets-further-digital-traceability-advances-for-Indonesia?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright).
- Nhamire, Borges, and Matthew Hill. "Exxon Awards JGC, Others \$13 Billion Mozambique LNG Contract." Bloomberg, October 9, 2019. <https://www.bloomberg.com/news/articles/2019-10-09/exxon-awards-jgc-others-13-billion-mozambique-lng-contract>.
- NITA-U (Uganda). "National Backbone Infrastructure Project (NBI/EGI)." <https://www.nita.go.ug/projects/national-backbone-infrastructure-project-nbiegi> (accessed September 23, 2019).
- Nitidæ. "COCOBLOCK—The Blockchain for a Better Traceability of Cocoa." 2019. <https://www.nitidae.org/en/actions/cocoblock-la-blockchain-pour-une-meilleure-tracabilite-du-cacao>.
- Njue, Danson. "Smart Cities: Rwanda's Kigali Makes Progress on Road to Becoming Africa's Smartest City." Ovum, April 12, 2018. <https://ovum.informa.com/resources/product-content/smart-cities-rwandas-kigali-makes-progress-on-road-to-becoming-africas-smartest-city>.
- Njue, E., L. Kirimi, and M. Mathenge. "Uptake of Crop Insurance among Smallholder Farmers: Insights from Maize Producers in Kenya." Paper presented at International Association of Agricultural Economists Conference, Vancouver, British Columbia, July 28–August 2, 2018. <https://ideas.repec.org/p/ags/iaae18/277023.html>.
- Nkurunziza, Michel. "Kigali City Bus Stops to Go Hi-Tech." *New Times* (Rwanda), January 5, 2019. <https://www.newtimes.co.rw/news/kigali-city-bus-stops-go-hi-tech>.
- Nkurunziza, Michel. "Pension fund put to task over 'expensive' housing projects." *New Times* (Rwanda), September 12, 2019. <https://www.newtimes.co.rw/news/pension-fund-put-task-over-expensive-housing-projects>.
- Nodar, Janet. "US Petrochemical Market Grapples with Tariffs." January 30, 2019. [https://www.joc.com/breakbulk/us-petrochemical-market-grapples-tariffs\\_20190130.html](https://www.joc.com/breakbulk/us-petrochemical-market-grapples-tariffs_20190130.html).
- Noonan, Laura. "Banks Use Fintech to Make Up for Lost Time on Financial Inclusion." *Financial Times*, April 23, 2019. <https://www.ft.com/content/091c9dd0-4b36-11e9-bde6-79eaea5acb64>.
- NS Energy (UK). "Greater Tortue Ahmeyim LNG Project." <https://www.nsenegybusiness.com/projects/greater-tortue-ahmeyim-lng-project/> (accessed September 23, 2019).

NS Energy (UK). "Nigeria LNG Plant Expansion, Bonny Island."

<https://www.nsenenergybusiness.com/projects/nigeria-lng-plant-expansion-bonny-island/>  
(accessed September 9, 2019).

Nuki, Paul. "Pointing the Way: How Medical Drones Are Saving Lives in Africa." *Telegraph*, February 16, 2018. <https://www.telegraph.co.uk/global-health/women-and-girls/pointing-way-medical-drones-saving-lives-africa/>.

Nwuneli, Ndidi. "Fake Processed Food Is Becoming an Epidemic in African Urban Life." *Quartz Africa*, March 10, 2018. <https://qz.com/africa/1226112/fake-food-or-fraud-food-in-nigeria-kenya-and-other-african-countries/>.

OICA. See International Organization of Motor Vehicle Manufacturers (OICA).

O'Keeffe, Geraldine. "Three Fintech Trends for Financial Inclusion in Sub-Saharan Africa." Center for Financial Inclusion, February 20, 2018. <https://www.centerforfinancialinclusion.org/three-fintech-trends-for-financial-inclusion-in-sub-saharan-africa>.

O'Keeffe, John. "Cheers to the World's Fastest Growing Beer Market." *Mail and Guardian* (South Africa), August 3, 2017. <https://mg.co.za/article/2017-08-03-cheers-to-the-worlds-fastest-growing-beer-market>.

Occidental. "Occidental Completes Acquisition of Anadarko." Press release, August 8, 2019. <https://www.oxy.com/News/Pages/Article.aspx?Article=6135.html>.

Odell, Steve, and Julia Fadzeyeva. *Emerging Technology Projection: The Total Economic Impact of IBM Blockchain*. IBM, Forrester Emerging Technology, July 2018. <https://www.ibm.com/downloads/cas/QJ4XA0MD>.

Oh, Erick. "Nigeria's Film Industry: Nollywood Looks to Expand Globally." U.S. International Trade Commission. Executive Briefing on Trade, October 2014. [https://www.usitc.gov/publications/332/erick\\_oh\\_nigerias\\_film\\_industry.pdf](https://www.usitc.gov/publications/332/erick_oh_nigerias_film_industry.pdf).

OilVoice. "West Africa's Gas Sector Becoming a Hive of Activity in 2018." *OilVoice Opinion*, November 16, 2017. <https://oilvoice.com/Opinion/10637/West-Africas-Gas-Sector-Becoming-a-Hive-of-Activity-in-2018->.

Oirere, Shem. "Refining: Uncertainty Grips South Africa's Clean Fuels Program." *Hydrocarbon Processing*, April 2017. <https://www.hydrocarbonprocessing.com/magazine/2017/april-2017/columns/refining-uncertainty-grips-south-africa-s-clean-fuels-program>.

Okorie, Chijioke. "Nigerian Copyright Commission Roundtable Report: Supreme Court Decisions on Locus Standi of CMOs." *The IPKat (blog)*, February 13, 2019. <http://ipkitten.blogspot.com/2019/02/nigerian-copyright-commission.html>.

Okoth, Edwin. "Vehicle Assemblers Gear Up for New Automotive Policy." *Business Daily* (Kenya), June 25, 2019. <https://www.businessdailyafrica.com/datahub/Vehicle-assemblers-gear-up-for-new-automotive/3815418-5170826-fyffdrz/index.html>.

- Olingo, Allan. "East Africa's Motor Assembly Sector Raring to Fire on All Cylinders Again." *East African* (Kenya), March 5, 2018. <https://www.theeastafrican.co.ke/business/Motor-assembly-sector-raring-to-fire-on-all-cylinders-again-/2560-4329320-qvw46bz/index.html>.
- Olingo, Allan. "Kenya, US Sign Amended Air Cargo Agreement." *EastAfrican* (Kenya), February 6, 2020. <https://www.theeastafrican.co.ke/business/Kenya-US-sign-amended-air-cargo-agreement/2560-5445888-l15e2nz/index.html>.
- Oloketuyi, Jacob Oladeji. "African Fintech Startups Are Revolutionizing Banking." Medium, March 17, 2018. <https://medium.com/syncedreview/african-fintech-startups-are-revolutionizing-banking-b726a1b4ccfe>.
- Olomu, Joshua. "NFVCB Officials Now SPY Policemen to Fight Piracy." News Agency of Nigeria, August 4, 2019. <https://www.nan.ng/entertainment/nfvcb-officials-now-spy-policemen-to-fight-piracy/>.
- Olson, Donald W. "Gemstones." *Mineral Commodity Summaries 2018*. U.S. Geological Survey, January 2018. <https://www.usgs.gov/centers/nmic/gemstones-statistics-and-information>.
- Olson, Donald W. "Gemstones." *Mineral Commodity Summaries 2019*. Reston, VA: U.S. Geological Survey, February 2019. <https://www.usgs.gov/centers/nmic/gemstones-statistics-and-information>.
- Olubanwo, Femi, and Oluwatoba Oguntuase. "Nigeria: Strengthening Intellectual Property Rights and Protection in Nigeria." *Mondaq*, March 11, 2019. <http://www.mondaq.com/Nigeria/x/788714/Trademark/Strengthening+Intellectual+Property+Rights+And+Protection+In+Nigeria>.
- Oludimu, Titilola. "Professional Nigerian YouTubers Have to Look outside YouTube to Make Money." Techpoint.Africa, March 27, 2019. <https://techpoint.africa/2019/03/27/ways-nigerian-YouTubers-make-money/>.
- Oludimu, Titilola. "There Are Probably less than 50,000 Netflix Subscribers in Nigeria." Techpoint.Africa, September 24, 2019. <https://techpoint.africa/2019/09/24/netflix-subscribers-nigeria/>.
- Oludimu, Titilola. "When Was the Last Time You Used Your DVD Player?" Techpoint.Africa, June 25, 2019. <https://techpoint.africa/2019/06/25/mobile-replacing-cddvd-entertainment/>.
- Olurounbi, Ruth. "Nigeria Approves Two GMO Cotton Varieties to Increase Output." Bloomberg, November 12, 2019. <https://www.bloomberg.com/news/articles/2019-05-08/nigeria-approves-two-gmo-cotton-varieties-in-bid-to-boost-output>.
- Omanufeme, Steve. "Runaway Success." IMF Finance and Development, June 2016. <https://www.imf.org/external/pubs/ft/fandd/2016/06/omanufeme.htm>.
- Onyido, John. "Copyright Collective Rights Management in Nigeria." *The Copyright Lawyer Magazine*, August 14, 2017. <https://www.mondaq.com/Nigeria/Intellectual-Property/619512/Copyright-Collective-Rights-Management-In-Nigeria>.

- Opensignal. *Global State of Mobile Networks (Overall Download Speed Comparison)*, February 2017. <https://www.opensignal.com/reports/2017/02/global-state-of-the-mobile-network>.
- Opiah, Abigail. "Kenya Signs \$665.4m Deal with China for Konza Data Centre and Smart City Plan." *Data Economy*, April 29, 2019. <https://data-economy.com/kenya-signs-665-4m-deal-with-china-for-konza-data-centre-and-smart-city-plan/>.
- Opoku Gakpo, Joseph. "This Is How Nigeria Plans to Avoid Burkina Faso's GM Cotton Curse." *Scientific African Magazine*, October 4, 2019. <https://sciamag.com/2019/10/04/this-is-how-nigeria-plans-to-avoid-burkina-fasos-gm-cotton-curse/>.
- Oregon State University (OSU) Extension Service. "Here's the Scoop on Chemical and Organic Fertilizers." *Crop Production: Organic Agriculture* news story, March 9, 2015. <https://extension.oregonstate.edu/news/heres-scoop-chemical-organic-fertilizers>.
- Orendorff, Aaron. "Global E-commerce Statistics." Shopify, *Global Ecommerce*, February 14, 2019. <https://www.shopify.com/enterprise/global-ecommerce-statistics/>.
- Organic Cotton. "World Cotton Production." n.d. <https://www.organiccotton.org/oc/Cotton-general/World-market/World-cotton-production.php> (accessed November 12, 2019).
- Organisation for Economic Co-operation and Development (OECD). "Cotton." *Atlas on Regional Integration in West Africa*, August 2006. <https://www.oecd.org/swac/publications/38409410.pdf>.
- Organisation for Economic Co-operation and Development (OECD). "Measuring International Investment by Multinational Enterprises." 2015. <https://www.oecd.org/corporate/FDI-BMD4-brochure.pdf>.
- Organisation for Economic Co-operation and Development (OECD). *Participation of Developing Countries in Global Value Chains: Implications for Trade*. 2015. [https://www.oecd-ilibrary.org/trade/participation-of-developing-countries-in-global-value-chains\\_5js33lfw0xxn-en](https://www.oecd-ilibrary.org/trade/participation-of-developing-countries-in-global-value-chains_5js33lfw0xxn-en).
- Organisation for Economic Co-operation and Development (OECD). *Services Trade Restrictiveness Index (STRI) Policy Simulator*. <https://sim.oecd.org/> (accessed January 3, 2019).
- Organisation for Economic Co-operation and Development (OECD). "The Trade Policy Implications of Global Value Chains." [http://www.oecd.org/sti/ind/Trade\\_Policy\\_Implications\\_May\\_2013.pdf](http://www.oecd.org/sti/ind/Trade_Policy_Implications_May_2013.pdf) (accessed January 24, 2020).
- Organisation for Economic Co-operation and Development (OECD) and Food and Agriculture Organization of the United Nations (FAO). *OECD-FAO Agricultural Outlook 2016–2025*, 2016. [https://www.oecd-ilibrary.org/content/publication/agr\\_outlook-2016-en](https://www.oecd-ilibrary.org/content/publication/agr_outlook-2016-en).
- Organisation for Economic Co-operation and Development (OECD) and Food and Agriculture Organization of the United Nations (FAO). *OECD-FAO Agricultural Outlook 2019–2028*, 2019. [https://www.oecd-ilibrary.org/content/publication/agr\\_outlook-2019-en](https://www.oecd-ilibrary.org/content/publication/agr_outlook-2019-en).

- Organization of the Petroleum Exporting Countries (OPEC). "Table 3.5: World Crude Oil Production by Country" and "Table 9.3: World Marketed Production of Natural Gas by Country." *Annual Statistical Bulletin*, June 2019. <https://asb.opec.org/index.php/data-download>.
- Owino, Julie. "Policy Pushing for Production of Locally Assembled Vehicles on Course." *Capital FM Business* (Kenya), August 9, 2019. <https://www.capitalfm.co.ke/business/2019/08/policy-pushing-for-production-of-locally-assembled-vehicles-on-course/>.
- Owler. Company Profiles Database. <https://www.owler.com/company/jumia> (accessed October 20, 2019).
- Oxford Business Group. "Kenya Offers a Range of Options for Agricultural Insurance." Excerpt from *The Report: Kenya 2017*, 2017. <https://oxfordbusinessgroup.com/analysis/seeds-growth-agriculture-presents-range-options-insurers>.
- Oyewole, Sandra. "A Peek inside Nigeria's Film Industry." *WIPO Magazine*, April 2014. [https://www.wipo.int/wipo\\_magazine/en/2014/02/article\\_0001.html](https://www.wipo.int/wipo_magazine/en/2014/02/article_0001.html).
- Ozawa, Sachiko, Daniel R. Evans, Sophia Bessias, Deson G. Haynie, Tatenda T. Yemeke, Sarah K. Laing, and James E. Herrington. "Prevalence and Estimated Economic Burden of Substandard and Falsified Medicines in Low- and Middle-income Countries: A Systematic Review and Meta-Analysis." *Journal of the American Medical Association (JAMA) Network Open* 1, no. 4 (August 10, 2018). <https://jamanetwork.com/journals/jamaoncology/fullarticle/2696509>.
- Pacyniak, Bernie. "Hershey Expands Its Learn to Grow Program in Ivory Coast." *Candy Industry*, September 10, 2014. <https://www.candyindustry.com/articles/86395-hershey-expands-its-learn-to-grow-program-in-ivory-coast>.
- Page, Sheila, and Sanoussi Bilal. *Regional Integration in Western Africa*. Overseas Development Institute (UK), September 2001. <https://www.odi.org/resources/docs/4628.pdf>.
- Palisade Research. "Manganese—The Third Electric Vehicle Metal No One Is Talking About." *Mining.com*, March 24, 2017. <https://www.mining.com/web/manganese-the-third-electric-vehicle-metal-no-one-is-talking-about-it-heres-how-to-take-advantage/>.
- Panhuisen, S., and Pierrot, J. *Coffee Barometer 2018*. Hivos, 2018. <https://www.hivos.org/assets/2018/06/Coffee-Barometer-2018.pdf>.
- Pannekoek, Frans. "Where Blockchain and Slave Free Chocolate Come Together." *Chainpoint Blog*, July 31, 2018. <https://blog.chainpoint.com/blog/where-blockchain-and-slave-free-chocolate-come-together>.
- Papageorgiou, Nikos. "Nigeria: Data Protection Regulation 'Will Help Close the Gaps.'" *OneTrust DataGuidance* (UK), February 21, 2019. <https://www.dataguidance.com/nigeria-data-protection-regulation-will-help-close-the-gaps/>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Paquette, Danielle. "The 'Amazon of Africa' Faces a Big Challenge: No Addresses." *Washington Post*, August 3, 2019. [https://www.washingtonpost.com/world/africa/the-amazon-of-africa-faces-a-big-challenge-no-addresses/2019/08/03/8f84f700-ae0f-11e9-b071-94a3f4d59021\\_story.html?utm\\_term=.616187f70da1](https://www.washingtonpost.com/world/africa/the-amazon-of-africa-faces-a-big-challenge-no-addresses/2019/08/03/8f84f700-ae0f-11e9-b071-94a3f4d59021_story.html?utm_term=.616187f70da1).
- Paquette, Danielle. "Nigeria's 'Fake News' Bill Could Jail People for Lying on Social Media. Critics Call It Censorship." *Washington Post*, November 25, 2019. [https://www.washingtonpost.com/world/africa/nigerias-fake-news-bill-could-jail-people-for-lying-on-social-media-critics-call-it-censorship/2019/11/25/ccf33c54-0f81-11ea-a533-90a7becf7713\\_story.html](https://www.washingtonpost.com/world/africa/nigerias-fake-news-bill-could-jail-people-for-lying-on-social-media-critics-call-it-censorship/2019/11/25/ccf33c54-0f81-11ea-a533-90a7becf7713_story.html).
- Paquette, Danielle. "Trump Ends Trade Benefits for Cameroon over 'Persistent Human Rights Violations.'" *Washington Post*, November 1, 2019. <https://agoa.info/news/article/15684-trump-ends-trade-benefits-for-cameroon-over-persistent-human-rights-violations.html>.
- Paravicini, Giulia. "Ethiopia Appoints Ethio Telecom Privatization Adviser, Seeks Another for Licensing." Reuters, September 26, 2019. <https://www.reuters.com/article/us-ethiopia-privatisation/ethiopia-appoints-ethio-telecom-privatization-adviser-seeks-another-for-licensing-idUSKBN1WB1I5>.
- Park, Walter and Douglas Lippoldt. "Technology Transfer and the Economic Implications of the Strengthening of Intellectual Property Rights in Developing Countries." OECD Trade Policy Working Papers, No. 62, OECD Publishing, 2008. [http://fs2.american.edu/wgp/www/park\\_lippoldt08.pdf](http://fs2.american.edu/wgp/www/park_lippoldt08.pdf).
- Payne, Julia, and Amanda Cooper. "UPDATE 1—Nigeria Shores Up Fuel Needs Ahead of 2019 Election with BP Deal." Reuters, November 1, 2018. <https://www.reuters.com/article/bp-nigeria-gasoline/update-1-nigeria-shores-up-fuel-needs-ahead-of-2019-election-with-bp-deal-idUSL8N1XC5GQ>.
- PayPal. "We Get Where You're Coming From." <https://www.paypal.com/us/webapps/mpp/country-worldwide> (accessed October 22, 2019).
- PCMag. "Definition of: Feature Phone." <https://www.pcmag.com/encyclopedia/term/62894/feature-phone> (accessed September 18, 2019).
- Perenco. "Cameroon." <https://www.perenco.com/subsidiaries/cameroon> (accessed September 25, 2019).
- Perry, Yifat. "Cloud Computing in the Media and Entertainment Industry with Cloud Volumes ONTAP." NetApp blog, July 4, 2018. <https://cloud.netapp.com/blog/benefits-of-cloud-computing-in-media-industry>.
- Pharma Intelligence. "South Africa to Tighten Up on Patentability to Promote Innovation, Improve Medicines Access." August 21, 2017. <https://pharmaintelligence.informa.com/resources/product-content/tighten-up-on-patenting>.

- Pierpaoli, Emanuele, Giacomo Carli, Erika Pignatti, and Maurizio Canavari. "Drivers of Precision Agriculture Technologies Adoption: A Literature Review." *Procedia Technology* 8 (2013): 61–69. <https://doi.org/10.1016/j.protcy.2013.11.010>.
- Pilling, David. "African economy: the limits of 'leapfrogging.'" *Financial Times*, August 13, 2018. <https://www.ft.com/content/052b0a34-9b1b-11e8-9702-5946bae86e6d>.
- Pilling, David. "Diageo Brews Beer in Kenya but Feels the Draught." *Financial Times*, November 1, 2019. <https://www.ft.com/content/362074ee-d558-11e9-8d46-8def889b4137>.
- Pilling, David. "The 'Uber' of Trucks Shakes Up Freight Transport across Africa." *Financial Times*, November 1, 2019. <https://www.ft.com/content/37f03714-d558-11e9-8d46-8def889b4137>.
- Plastic Technologies Inc, "Solution Intrinsic Viscosity." <https://www.plastictechnologies.com/test/solution-intrinsic-viscosity/> (accessed October 22, 2019).
- Plume, Karl, and P.J. Huffstutter. "U.S. Bird Flu Outbreak in Poultry." Reuters, May 29, 2015. <https://www.reuters.com/article/us-health-birdflu-usa-factbox/u-s-bird-flu-outbreak-in-poultry-idUSKBN0OE2OG20150529>.
- PNC Bank. *Metal Industry Report, First Quarter 2019*, January 2019. <https://www.pnc.com/en/about-pnc/media/economic-reports.html>.
- Policy and Legal Advocacy Center (PLAC) (Nigeria). "Bill to Amend Copyright Act Passes Second Reading in House." June 7, 2017. <https://placng.org/i/bill-to-amend-copyright-act-passes-second-reading-in-house/>.
- Polyak, Desiree. "Vanadium." *Mineral Commodity Summaries, 2019*. U.S. Geological Survey. <https://www.usgs.gov/centers/nmic/vanadium-statistics-and-information>.
- Pouris, Anthipi and Anastassios Pouris. "Patents and Economic Development in South Africa." *South African Journal of Science*, vol. 107 no. 11-12. January 2011. [http://www.scielo.org.za/scielo.php?script=sci\\_arttext&pid=S0038-23532011000600008](http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0038-23532011000600008).
- Porto, Guido G., Marcelo Olarreaga, and Nicolas Chauvin. *Supply Chains in Export Agriculture, Competition, and Poverty in Sub-Saharan Africa*. Washington, DC: World Bank, 2011. [https://cepr.org/sites/default/files/geneva\\_reports/GenevaP219.pdf](https://cepr.org/sites/default/files/geneva_reports/GenevaP219.pdf).
- Prieur, Laurent, and Bate Felix. "Arab Maghreb Union Creates Investment Bank." Reuters, January 9, 2013. <http://www.reuters.com/article/2013/01/10/mauritania-investment-bank-idUSL5E9CA00520130110>.
- Privacy International. "State of Privacy Kenya." January 2019. <https://privacyinternational.org/state-privacy/1005/state-privacy-kenya>.
- Prokopivič, Karolina. "Why Drone Use Is Different in Africa." *Aviation Voice* (Lithuania), May 18, 2018. <https://aviationvoice.com/why-drone-use-is-different-in-africa-2-201805181030/>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Property Rights Alliance. “2019 International Property Rights Index: Countries.”

<https://internationalpropertyrightsindex.org/#world-map> (accessed January 21, 2020).

Pula Advisors (Switzerland and Kenya). “FAQ.” [www.pula-advisors.com/faq/](http://www.pula-advisors.com/faq/) (accessed October 15, 2019).

Punch (Nigeria). “NFVCB to Authenticate Nollywood Movie Labels to Curb Piracy.” March 15, 2019.

<https://punchng.com/nfvcb-to-authenticate-nollywood-movie-labels-to-curb-piracy/>.

Purdue University. College of Agriculture. “Why Do We Use GMOs?” n.d.

<https://ag.purdue.edu/GMOs/Pages/WhyGMOs.aspx> (accessed November 25, 2019).

Purnell, Newley. “The Hottest Phones for the Next Billion Users Aren’t Smartphones.” *Wall Street Journal*, July 23, 2019. <https://www.wsj.com/articles/the-hottest-phones-for-the-next-billion-users-arent-smartphones-11563879608> (fee required).

PwC. “Africa’s Next Automotive Hub.” PwC Nigeria Automotive Industry, 2015.

<https://www.pwc.com/ng/en/assets/pdf/africas-next-automotive-hub.pdf>.

PwC. *Insights from the Entertainment and Media Outlook: 2019–2023; An African Perspective*, October

2019. <https://pricewaterhousecoopers-pwc.africa-newsroom.com/files/download/f2f955fb493be20>.

Pyzyk, Katie. “ISRI Commodities Roundtable: China and Tariffs Are Forcing Market Changes.” *Waste Dive*, September 10, 2018. <https://www.wastedive.com/news/isri-commodities-roundtable-china-tariffs-forcing-market-changes/531941/>.

Quadratec. “How Catalytic Converters Work.”

[https://www.quadratec.com/jeep\\_knowledgebase/article-80.htm](https://www.quadratec.com/jeep_knowledgebase/article-80.htm) (accessed September 18, 2019).

Rainforest Alliance. “Our Response to the Washington Post’s Report on Challenges in Cocoa Farming in West Africa.” Rainforest Alliance, October 23, 2019. <https://www.rainforest-alliance.org/articles/response-to-washington-post-report-on-challenges-in-cocoa-farming-in-west-africa>.

Ralston, Robin, and Shawna Hite. “Understanding Genetically Modified Foods.” Ohio State University Extension, College of Food, Agricultural, and Environmental Sciences, fact sheet, August 23, 2016. <https://ohioline.osu.edu/factsheet/HYG-5058>.

Rao, Pavithra. “Africa Could Be the Next Frontier for Cryptocurrency.” *Africa Renewal*, United Nations, April–July 2018. <https://www.un.org/africarenewal/magazine/april-2018-july-2018/africa-could-be-next-frontier-cryptocurrency>.

Ramachandran, Vijaya, Jennifer Obado-Joel, Razaq Fatai, Junaid Sadiq Masood, and Blessing Omakwu. *The New Economy of Africa: Opportunities for Nigeria’s Emerging Technology Sector*. Center for Global Development, November 12, 2019. <https://www.cgdev.org/sites/default/files/new-economy-africa-opportunities-nigerias-emerging-technology-sector.pdf>.

- Ramsay, Peter. "Deepwater Struggles to Make Its Case." *Petroleum Economist*, May 21, 2019. <https://www.petroleum-economist.com/articles/upstream/exploration-production/2019/deepwater-struggles-to-make-its-case>.
- Ramsey, Jonathon. "Energy Density of EV and Gasoline Powertrains will Converge." *The Drive*, May 18, 2016, <https://www.thedrive.com/news/3539/energy-density-of-ev-and-gasoline-powertrains-will-converge>.
- Rand Refinery. "About Us." <http://www.randrefinery.com/about-us/> (accessed September 16, 2019).
- Rand Refinery. "Services." <http://www.randrefinery.com/services/> (accessed September 16, 2019).
- Rapaport News. "Global Diamond Production Value Rises." *Diamonds.Net*, July 7, 2019. <https://www.diamonds.net/News/NewsItem.aspx?ArticleID=63906&ArticleTitle=Global+Diamond+Production+Value+Rises>.
- Rapaport News. "Holiday Jewelry Sales Rise 4%." *Diamonds.Net*, December 27, 2018. <https://www.diamonds.net/News/NewsItem.aspx?ArticleID=63180&ArticleTitle=Holiday+Jewelry+Sales+Rise+4%25>.
- Rapaport News. "Holiday Sales Growth Misses Expectations." *Diamonds.Net*, February 17, 2019. <https://www.diamonds.net/news/NewsItem.aspx?ArticleID=63377>.
- Real Engineering. "How Rwanda Built a Drone Delivery Service." YouTube video, January 25, 2019. <https://www.youtube.com/watch?v=jEbRVNxL44c>.
- Reboredo, Ricardo, and Frances Brill. "Failed Fantasies in a South African Context: The Case of Modderfontein, Johannesburg." *Urban Forum* 30, no. 2 (2018): 171–89. <https://link.springer.com/article/10.1007/s12132-018-9348-1>.
- Reboredo, Ricardo, and Frances Brill. "Smart Cities in Developing Countries Can Learn from Johannesburg's Failed 'New York of Africa.'" *Quartz Africa*, March 8, 2019. <https://qz.com/africa/1568015/johannesburgs-lessons-for-eko-atlantic-konza-new-cairo/>.
- Recycling Today*. "China Releases New Proposed Contaminants Thresholds." November 16, 2017. <https://www.recyclingtoday.com/article/china-proposes-contaminants-thresholds/>.
- Reed, Stanley. "Finding Success on the Oil Frontier." *New York Times*, July 3, 2012. <https://www.nytimes.com/2012/07/04/business/global/tullow-oil-finds-success-exploring-where-others-dont.html>.
- Reid, Kim. "The Science of . . . 'We're Not Breaking Even Yet. It's Been 8 Years. It's Not Unusual.'" Interview by Bruce Whitfield. *The Money Show*, Radio 702 (Johannesburg), February 26, 2019. <http://www.702.co.za/articles/339323/we-re-not-breaking-even-yet-it-s-been-8-years-it-s-not-unusual>.
- Relief Web. "Kenya: Drought—2014–2019." United Nations Office for the Coordination of Humanitarian Affairs (OCHA), 2019. <https://reliefweb.int/disaster/dr-2014-000131-ken>.

Renjen, Punit. "How Leaders Are Navigating the Fourth Industrial Revolution." Deloitte, January 17, 2020. <https://www2.deloitte.com/us/en/insights/deloitte-review/issue-22/industry-4-0-technology-manufacturing-revolution.html>.

Research Program on Climate Change, Agriculture and Food Security (CCAFS) and CGIAR. "Climate Services and Safety Nets: Index-based Insurance." <https://ccafs.cgiar.org/themes/index-based-insurance> (accessed October 10, 2019).

Reuters. "BRIEF-AB InBev Announces Post-SABMiller Deal Leadership." August 4, 2016. <https://www.reuters.com/article/idUSFWN1AL08U>.

Reuters. "Drones Could Speed Up HIV Tests in Remote Areas." April 20, 2016. <https://www.reuters.com/article/us-malawi-hiv-drones-idUSKCN0XH1ZN>.

Revich, Jerry, Robert Koort, Patrick Archambault, Adam Samuelson, Michael Nannizzi, Mohammed Moawalla, and Andrew Bonin. "Precision Farming: Cheating Malthus with Digital Agriculture." Goldman Sachs Research, July 13, 2016. [https://docdrop.org/static/drop-pdf/GSR\\_agriculture-N1sH6.pdf](https://docdrop.org/static/drop-pdf/GSR_agriculture-N1sH6.pdf).

RH Bophelo (South Africa). "A Glimpse into the South African Healthcare Industry." 2019. <https://www.rhbophelo.co.za/understand-the-south-african-healthcare-industry/>.

Rice, Andrew. "The Mogul of Nigeria." *Fast Company*, April 2013. <http://www.fastcompany-digital.com/fastcompany/201304?pg=111#pg111>.

Richards, Mike. "Importing Used or Salvage Vehicles from the United States into Benin." *Auto Action Mall*, May 23, 2019. <https://www.autoauctionmall.com/learning-center/importing-used-salvage-vehicles-united-states-benin/>.

Ricker-Gilbert, Jacob, and T.S. Jayne. "Estimating the Enduring Effects of Fertiliser Subsidies on Commercial Fertiliser Demand and Maize Production: Panel Data Evidence from Malawi." *Journal of Agricultural Economics* 68, no. 1 (February 2017): 70–97. <https://doi.org/10.1111/1477-9552.12161>.

Rise Africa Rise. "Drones Will Change Africa. Here Is How." n.d. <https://riseafricarise.com/drones-will-change-africa-here-is-how/> (accessed July 2, 2019).

Roelf, Wendell. "South Africa May Ask Pharma Firms for Fee to Clear Drug Review Backlog." *Reuters*, April 9, 2018. <https://www.reuters.com/article/us-safrica-pharmaceuticals/south-africa-may-ask-pharma-firms-for-fee-to-clear-drug-review-backlog-idUSKBN1HG15I>.

Rogers, Everett M. *Diffusion of Innovations*. 3rd ed. New York: Free Press; London: Collier Macmillan, 1983.

Rosen, Jonathan R. "Zipline's Ambitious Medical Drone Delivery in Africa." *MIT Technology Review*, June 8, 2017. <https://www.technologyreview.com/s/608034/blood-from-the-sky-ziplines-ambitious-medical-drone-delivery-in-africa/>.

- Roser, Max, and Hannah Ritchie. "Fertilizers." *Our World in Data*, 2020. <https://ourworldindata.org/fertilizers> (accessed Feb 27, 2020).
- Roskill Information Services. "Chromium—Outlook to 2029, 15th Edition." June 26, 2019. <https://roskill.com/market-report/chromium/>.
- Roskill Information Services. "Titanium Minerals Global Industry, Markets & Outlook." December 8, 2016. <https://roskill.com/market-report/titanium-minerals/>.
- Rowling, Rupert, Eddie van der Walt and Ranjeetha Pakiam. "Why Palladium's Suddenly an Especially Precious Metal." *Washington Post*, February 21, 2019. [https://www.washingtonpost.com/business/why-palladiums-suddenly-an-especially-precious-metal/2019/02/21/2f863800-35b0-11e9-8375-e3dcf6b68558\\_story.html](https://www.washingtonpost.com/business/why-palladiums-suddenly-an-especially-precious-metal/2019/02/21/2f863800-35b0-11e9-8375-e3dcf6b68558_story.html).
- Rumney, Emma. "Ford to Add 1,200 Jobs, Shift in South Africa." *Automotive News*, July 17, 2019. <https://www.autonews.com/automakers-suppliers/ford-add-1200-jobs-shift-south-africa>.
- Runsewe, Oreoluwa. "Ghana Unveils Plans to Increase Its Cocoa Processing Capacity." *Ventures Africa*, January 7, 2019. <http://venturesafrica.com/ghana-plans-to-increase-its-cocoa-processing-capacity/>.
- Russell, Michelle. "Nigeria Launches Initiative to Revive Cotton Sector." *Just-Style*, September 24, 2019. [https://www.just-style.com/news/nigeria-launches-initiative-to-revive-cotton-sector\\_id137130.aspx](https://www.just-style.com/news/nigeria-launches-initiative-to-revive-cotton-sector_id137130.aspx).
- Sadeque, Samira. "Smartphones Lost Market Share to Feature Phones in Africa Last Year." *Quartz Africa*, February 14, 2018. <https://qz.com/africa/1206462/smartphones-lost-market-share-to-feature-phones-in-africa-last-year/>.
- Safripol, Preferred Polymer Partner. <http://www.safripol.com/> (accessed October 22, 2019).
- Sahara Group. "Sahara Gas Vessel Boosts LPG Availability with Historic 7,000MT Delivery to Nigeria." Press release, July 2, 2018. <https://www.sahara-group.com/2018/07/03/sahara-gas-vessel-boosts-lpg-availability-with-historic-7000mt-delivery-to-nigeria/>.
- Salaam-Blyther, Tiaji, Charles Hanrahan, and Nicolas Cook. *Child Labor in West African Cocoa Production: Issues and U.S. Policy*. Congressional Research Service (CRS) Report R32990, July 13, 2005. <https://nationalaglawcenter.org/wp-content/uploads/assets/crs/RL32990.pdf>.
- Salami, Ayo Luqman, and Funke Oladoke. "Insight: Nigerian Petroleum Industry Fiscal Bill—Encouraging Investment?" *Bloomberg Daily Tax Report*, June 5, 2019. <https://news.bloombergtax.com/daily-tax-report-international/insight-nigerian-petroleum-industry-fiscal-bill-encouraging-investment>.
- Sampat, Bhaven N., and Ken Shadlen. *The Effects of Restrictions on Secondary Pharmaceutical Patents: Brazil and India in Comparative Perspective*. Harvard University, Department of Economics, 2016. <https://pdfs.semanticscholar.org/4527/1e5d7c002400d4e3a8a6baff1fd75a9db583.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Sandler, Travis, & Rosenberg, P.A. (Sandler Travis). China 301 List 1.

<https://www.strtrade.com/assets/htmldocuments/China%20301%20List%201.pdf> (accessed July 9, 2019).

Sandvine. "The Global Internet." September 2019.

[https://www.sandvine.com/hubfs/Sandvine\\_Redesign\\_2019/Downloads/Internet%20Phenomena/Internet%20Phenomena%20Report%20Q32019%2020190910.pdf](https://www.sandvine.com/hubfs/Sandvine_Redesign_2019/Downloads/Internet%20Phenomena/Internet%20Phenomena%20Report%20Q32019%2020190910.pdf).

Sarkodie, Samuel Asumadu. "Lessons to Be Learnt from Ghana's Excess Electricity Shambles." *The Conversation*, August 5, 2019. <https://theconversation.com/lessons-to-be-learnt-from-ghanas-excess-electricity-shambles-121257>.

Sasse, Allegresse, and Paul Carsten. "Nigeria Recession Deals Blow to Smuggling Hub Benin." Reuters, March 20, 2017. <https://www.reuters.com/article/us-nigeria-benin-smuggling-idUSKBN17125X>.

Scarpelli, Brian. ACT | The App Association. Written submission to the U.S. International Trade Commission in connection with Inv. No. 332-571, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments*, July 17, 2019.

Schneidman, Witney. "Nollywood, Intellectual Property and Nigeria's New GDP." *Cov Africa (blog)*, Covington Africa Practice, April 10, 2014. <http://www.covafrika.com/2014/04/nollywood-intellectual-property-and-nigerias-new-gdp/>.

Science History Institute (SHI). "Herbert W. Boyer and Stanley N. Cohen." December 1, 2017. <https://www.sciencehistory.org/historical-profile/herbert-w-boyer-and-stanley-n-cohen>.

Searcey, Dionne, and Matt Richtel. "Obesity Was Rising as Ghana Embraced Fast Food. Then Came KFC." *New York Times*, October 2, 2017. <https://www.nytimes.com/2017/10/02/health/ghana-kfc-obesity.html>.

SEC. See U.S. Securities and Exchange Commission (SEC).

Seetenah, Boopen. "Inward FDI in Mauritius and Its Policy Context." Columbia University. Columbia Law School and the Earth Institute. Columbia Center on Sustainable International Investment. Columbia FDI profiles, April 30, 2013. [http://ccsi.columbia.edu/files/2014/03/Mauritius\\_IFDI\\_-\\_April\\_30\\_-\\_FINAL.pdf](http://ccsi.columbia.edu/files/2014/03/Mauritius_IFDI_-_April_30_-_FINAL.pdf).

Sehnke, Errol D. "Gold." *Mineral Commodity Summaries* (various years). Reston, VA: U.S. Geological Survey, January 1996 to February 1997. <https://www.usgs.gov/centers/nmic/gold-statistics-and-information>.

Semiconductor Industry Association (SIA). "Beyond Borders: The Global Semiconductor Value Chain." May 2016. <https://www.semiconductors.org/wp-content/uploads/2018/06/SIA-Beyond-Borders-Report-FINAL-June-7.pdf>.

Semiconductor Industry Association (SIA). "Semiconductors and the Future of the Harmonized System." May 6, 2019. <https://www.semiconductors.org/resources/semiconductors-the-future-of-the-harmonized-system/>.

- Sengupta, Caesar. "The Next Billion Users Are the Future of the Internet." *The Keyword* (blog), Google, February 14, 2018. <https://www.blog.google/perspectives/caesar-sengupta/next-billion-users-are-future-internet/>.
- Sengupta, Somini. "Hotter, Drier, Hungrier: How Global Warming Punishes the World's Poorest." *New York Times*, March 12, 2018. <https://www.nytimes.com/2018/03/12/climate/kenya-drought.html>.
- Sesema Public Relations. "FMC Technologies Expands Subsea Services Support in Nigeria." June 21, 2016. <http://sesema.com/fmc-technologies-expands-subsea-services-support-nigeria/>.
- Shabalala, Zandi, and Edward Stoddard. "South Africa's Sibanye-Stillwater to Be No. 2 Platinum Miner with Lonmin Buy." Reuters, December 14, 2017. <https://www.reuters.com/article/us-lonmin-m-a-sibanye-gold/south-africas-sibanye-stillwater-to-be-no-2-platinum-miner-with-lonmin-buy-idUSKBN1E8165>.
- Shaban, Abdur Rahman Alfa. "Ethiopia Bags a Continental First with \$2.2m Smart Parking Facility." *Africa News*, June 15, 2017. <https://www.africanews.com/2017/06/15/ethiopia-s-22m-smart-parking-facility-is-africa-s-first/>.
- Shadow and Act. "iRokotv Chief: Netflix Being in Nigeria Has Zero Impact on the Company and Its Future." April 20, 2017. <https://shadowandact.com/irokotv-chief-netflix-being-in-nigeria-has-zero-impact-on-the-company-and-its-future/>.
- Shapshak, Toby. "Africa's Fintech Ecosystem Raised \$320m and Grew 60 Percent in Two Years." *Forbes*, June 29, 2019. <https://www.forbes.com/sites/tobyshapshak/2019/06/29/africas-fintech-ecosystem-raised-320m-and-grew-60-in-two-years/>.
- Sharma, Romit. "How Blockchain and Technology Are Encouraging an Enhanced First Mile Delivery?" *TechCrack* (blog), 2018. <https://www.techcrackblog.com/2018/08/significance-of-blockchain-in-digitizing-first-mile.html>.
- Shedd, Kim B. "Cobalt." *Mineral Commodity Summaries*. Reston, VA: U.S. Geological Survey (USGS), 2019. <https://www.usgs.gov/centers/nmic/cobalt-statistics-and-information>.
- She Leads Africa (SLA). "Growth of E-commerce Gives Rise to Sophisticated African Digital Consumer." <https://sheleadsafrica.org/growth-of-ecommerce/> (accessed August 8, 2019).
- Shister, Amelia. "From Bean to Bar: Trends and Opportunities in Cocoa Supply Chain Transparency." U.S. International Trade Commission. *Executive Briefing on Trade*, July 2019. [https://www.usitc.gov/sites/default/files/publications/332/executive\\_briefings/ebot\\_amelia\\_shister\\_cocoa\\_supply\\_chain\\_pdf.pdf](https://www.usitc.gov/sites/default/files/publications/332/executive_briefings/ebot_amelia_shister_cocoa_supply_chain_pdf.pdf).
- Siba, Eyerusalem, and Mariama Sow. "Smart City Initiatives in Africa." *Africa in Focus* (blog), Brookings, November 1, 2017. <https://www.brookings.edu/blog/africa-in-focus/2017/11/01/smart-city-initiatives-in-africa/>.

- Siba, Eyerusalem, and Mariama Sow. "Strengthening Regional Value Chains: What's the Role of the African Continental Free Trade Agreement." *Africa in Focus (blog)*, Brookings, March 21, 2018. <https://www.brookings.edu/blog/africa-in-focus/2018/03/21/strengthening-regional-value-chains-whats-the-role-of-the-african-continental-free-trade-agreement/>.
- Sibanye-Stillwater. "Mimosa." n.d. <https://www.sibanyestillwater.com/business/southern-africa/pgm-operations/mimosa/> (accessed September 17, 2019).
- Sibiko, Kenneth, Prakashan Veettil, and Matin Qaim. "Small Farmers' Preferences for Weather Index Insurance: Insights from Kenya." *Agriculture and Food Security* 7, no. 1 (2018): 1–14. <https://agricultureandfoodsecurity.biomedcentral.com/track/pdf/10.1186/s40066-018-0200-6>.
- Siekman, Dan. "China to Produce Half of Global Macadamia Crop by 2022." *Produce Report*, August 21, 2018. <https://www.producereport.com/article/china-produce-half-global-macadamia-crop-2022>.
- Signé, Landry, and Chelsea Johnson. *African Consumer Market Potential: Trends, Drivers, Opportunities, and Strategies*. Brookings Institution, December 2018. <https://www.brookings.edu/wp-content/uploads/2018/12/Africas-consumer-market-potential.pdf>.
- Signé, Landry, and Chelsea Johnson. *The Potential of Manufacturing and Industrialization in Africa: Trends, Opportunities, and Strategies*. Brookings Institution, September 2018. <https://www.brookings.edu/wp-content/uploads/2018/09/Manufacturing-and-Industrialization-in-Africa-Signe-20180921.pdf>.
- Signé, Landry, and Colette van der Ven. *Keys to Success for the AfCFTA Negotiations*. Brookings Institution, May 2019. [https://www.brookings.edu/wp-content/uploads/2019/05/Keys\\_to\\_success\\_for\\_AfCFTA.pdf](https://www.brookings.edu/wp-content/uploads/2019/05/Keys_to_success_for_AfCFTA.pdf).
- Silva, Felipe de Figueiredo, Gregory Graff, and David Zilberman. "Venture Capital and the Transformation of Private R & D for Agriculture and Food." In *International Consortium on Applied Bioeconomy Research*, 2019. <https://ideas.repec.org/h/nbr/nberch/14298.html>.
- Silver, Laura, and Courtney Johnson. "Internet Connectivity Seen as Having Positive Impact on Life in Sub-Saharan Africa." Pew Research Center, October 9, 2018. <https://www.pewresearch.org/global/2018/10/09/internet-connectivity-seen-as-having-positive-impact-on-life-in-sub-saharan-africa/>.
- Simons, Bright. "Why "Leapfrogging" in Frontier Markets Isn't Working." Center for Global Development, March 31, 2019. <https://www.cgdev.org/publication/why-leapfrogging-frontier-markets-isnt-working>.
- Singerling, Sheryl A. "Platinum-Group Metals." *Mineral Commodity Summaries 2019*. Reston, VA: U.S. Geological Survey, February 2019. 124–125. <https://www.usgs.gov/centers/nmic/platinum-group-metals-statistics-and-information>.

- Smart Cities World Forums. "Huawei Launch 'Smart Transportation Solution' for Bus Sector in Africa." March 28, 2017. <http://www.smartcitiesworldforums.com/news/smart-cities-africa/smart-mobility-deployments-af/219-huawei-launch-smart-transportation-solution-for-bus-sector-in-africa>.
- Smart Energy International. "Africa Ready to Adopt Smart Grid Technology." May 14, 2019. <https://www.smart-energy.com/news/africa-smart-grid-technology/>.
- Smith, Matt. "Discoveries Boost Angola Upstream Mood." *Petroleum Economist*, August 27, 2019. <https://www.petroleum-economist.com/articles/upstream/exploration-production/2019/discoveries-boost-angola-upstream-mood>.
- Smith, Matt. "In Wake of Romaine E. Coli Scare, Walmart Deploys Blockchain to Track Leafy Greens." Walmart news release, September 24, 2018. <https://corporate.walmart.com/newsroom/2018/09/24/in-wake-of-romaine-e-coli-scare-walmart-deploys-blockchain-to-track-leafy-greens>.
- Sony Corporation v. Sony Holding Limited [ 2018 ] eKLR. Civil appeal no. 376 of 2015 (2018): 1–13. <http://kenyalaw.org/caselaw/cases/view/153543/>.
- South African Breweries. "South Africa's Top Brewer, SAB Heritage." <http://www.sab.co.za/heritage> (accessed September 19, 2019).
- South African Wine Industry and Systems (SAWIS). *SA Wine Industry 2018 Statistics NR43*, 2019. <http://www.wosa.co.za/wosadocs/72019/SAWIS%20Stats%20Book%202018.pdf>.
- South Coast Herald* (South Africa). "Nuts for Nuts: Market Value for Macadamias Up a Whopping 72%." July 17, 2018. <https://southcoastherald.co.za/302812/nuts-nuts-market-value-macadamias-whopping-72/>.
- Southern African Customs Union (SACU). "About SACU." <https://www.sacu.int/> (accessed September 30, 2019).
- Southern African Development Community (SADC). "Customs Union." <https://www.sadc.int/about-sadc/integration-milestones/customs-union/> (accessed September 27, 2019).
- Southern African Development Community (SADC). "Facts and Figures." <https://sadc.int/about-sadc/overview/sadc-facts-figures/> (accessed September 27, 2019).
- Southern African Development Community (SADC). "Free Trade Area." <https://www.sadc.int/about-sadc/integration-milestones/free-trade-area/> (accessed September 27, 2019).
- Southern African Development Community (SADC). "Member States." <https://sadc.int/member-states/> (accessed various dates, 2019).
- Southern African Development Community (SADC). "SADC and European Union (EU) Sign Three New Programmes Totaling €47 Million for a Five-Year Period." News release, August 18, 2019. <https://www.sadc.int/news-events/news/sadc-and-european-union-eu-sign-three-new-programmes-totalling-47-million-five-year-period/>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Sow, Mariama. "Africa in the News: JP Morgan Chase Plans Africa Expansion, Davos Meetings Attract African Leaders, and Total SA Builds Oil Pipeline in Kenya." *Africa in Focus* (blog), Brookings Institution, January 26, 2018. <https://www.brookings.edu/blog/africa-in-focus/2018/01/26/africa-in-the-news-jp-morgan-chase-plans-africa-expansion-davos-meetings-attract-african-leaders-and-total-sa-builds-oil-pipeline-in-kenya/>.

Specialty Steel Industry of North America (SSINA). "Design Guidelines for the Selection and Use of Stainless Steel." November 2, 2018. [http://www.ssina.com/download\\_a\\_file/designguidelines.pdf](http://www.ssina.com/download_a_file/designguidelines.pdf).

Speed+. "Informing the Mozambique National AGOA Utilization Strategy." June 15, 2017. <https://agoa.info/images/documents/15272/speed-017-r005b-informing-the-mozambique-agoa-strategy-2017-07-18.pdf>.

Speed+. "Mozambique National AGOA Utilization Strategy 2018–2025." May 16, 2018. <https://agoa.info/images/documents/15423/mozambique-national-agoa-utilization-strategy-2018-2025.pdf>.

Starbucks. *Fiscal 2018 Annual Report*, 2019. <https://investor.starbucks.com/financial-data/annual-reports/default.aspx>.

Starbucks. *Store Counts: by Market*. Starbucks Investor Relations, Supplemental Financial Data, 2019. <https://investor.starbucks.com/financial-data/supplemental-financial-data/default.aspx>.

Starbucks. "Story Map Journal." 2014. <https://starbucks.maps.arcgis.com/apps/MapJournal/index.html?appid=f89083cd220d409b81ab10c7fa6c6f67>.

*Star, The* (Malaysia). "Pasdec Enters RM380M Manufacturing Contract with Nissan South Africa." October 11, 2018. <https://www.thestar.com.my/business/business-news/2018/10/11/pasdec-enters-rm380m-manufacturing-contract-for-nissan-south-afria>.

Statcounter. "Mobile Operating System Market Share Worldwide." August 2019. <https://gs.statcounter.com/os-market-share/mobile/worldwide/#yearly-2018-2019>.

Statcounter. "Social Media Stats Africa." <https://gs.statcounter.com/social-media-stats/all/africa> (accessed various dates).

Statista. "Active Customers of Jumia Technologies AG as of 3rd Quarter 2019." November 21, 2019. <https://www.statista.com/statistics/1043008/annual-active-customers-jumia/>.

Statista. "Annual Gross Merchandise Volume of Jumia Technologies AG from 2017 to 2018." August 27, 2019. <https://www.statista.com/statistics/1043023/annual-gmv-jumia/>.

Statista. "Annual Net Revenue of Jumia Technologies AG from 2017 to 2018." August 26, 2019. <https://www.statista.com/statistics/1042966/annual-net-revenue-of-jumia/>.

Statista. "Annual Operating Loss of Jumia Technologies AG from 2017 to 2018." August 26, 2019. <https://www.statista.com/statistics/1042995/annual-operating-loss-jumia/>.

- Statista. "Average Electricity Prices in Africa in 2016, by Select Country (in U.S. Dollars per Megawatt Hour)." 2016. <https://www.statista.com/statistics/503727/retail-electricity-prices-in-africa-by-select-country/>.
- Statista, "E-commerce in China." 2019. <https://www.statista.com/topics/1007/e-commerce-in-china/>.
- Statista, "E-commerce in the United States." 2019. <https://www.statista.com/study/28028/e-commerce-in-the-united-states-statista-dossier/>.
- Statista. "Steel Production Figures in the U.S. from 2006 to 2019." February 2020. <https://www.statista.com/statistics/209343/steel-production-in-the-us/>.
- Statista. "World Cotton Production by Country 2019." n.d. <https://www.statista.com/statistics/263055/cotton-production-worldwide-by-top-countries/> (accessed November 12, 2019).
- Stedman, Chris. "Inauguration of Petredec LPG Terminal." Speech. Government of Mauritius, Commerce, March 20, 2014. <http://commerce.govmu.org/English/AboutUs/The%20Minister/Documents/Speech%20200314.pdf>.
- Steiner, Ina. "eBay Opens Door to African Sellers with Help of DHL." Ecommercebytes, August 22, 2017. <https://www.ecommercebytes.com/2017/08/22/ebay-opens-door-african-sellers-help-dhl/>.
- Stillwater Mining Co. (Stillwater). "Stillwater Mining Company Announces Completion of Acquisition by Sibanye." News release, May 4, 2017. <https://www.globenewswire.com/news-release/2017/05/04/978602/0/en/Stillwater-Mining-Company-Announces-Completion-of-Acquisition-by-Sibanye.html>.
- Stine, Lauren. "How a Little Sensor Is Making a Big Impact on the Global Cocoa Industry." Ag Funder News, April 15, 2019. <https://agfundernews.com/how-a-little-sensor-is-making-a-big-impact-on-the-global-cocoa-industry.html>.
- Stroud, Anna. "Coca-Cola SA Reformulates Beverages Following Tax." *Independent Online*, May 23, 2019. <https://www.iol.co.za/news/south-africa/coca-colasa-reformulates-beverages-following-tax-23828652>.
- sUAS News. "Drone Fleet Transports Vaccines to Immunize Children in Remote Health Facilities in the Democratic Republic of the Congo." August 9, 2019. <https://www.suasnews.com/2019/08/drone-fleet-transport-vaccines-to-immunize-children-in-remote-health-facilities-in-the-democratic-republic-of-congo/>.
- Subramani, Swapna, and Megha Kumar. "Enterprise IT Outlook: Trends to Watch in the Datacenter, Cloud, Outsourcing, and Security Markets in 2019 and Beyond." *International Data Corporation (IDC)*, 2019 (fee required).
- Sunding, David, and David Zilberman. "The Agricultural Innovation Process: Research and Technology Adoption in a Changing Agricultural Sector." Chap. 4 in *Handbook of Agricultural Economics*, vol. 1, part A, 207–61. Amsterdam: Elsevier, 2001. [https://doi.org/10.1016/S1574-0072\(01\)10007-1](https://doi.org/10.1016/S1574-0072(01)10007-1).

Suri, Tavneet, and William Jack. "The Long-run Poverty and Gender Impacts of Mobile Money." *Science*, December 9, 2016. <https://science.sciencemag.org/content/354/6317/1288>.

Suttie, David, and Rui Benfica. "Fostering Inclusive Outcomes in Sub-Saharan African Agriculture: Improving Agricultural Productivity and Expanding Agribusiness Opportunities." International Fund for Agricultural Development (IFAD), IFAD Research Series 03, 2016. [https://www.ifad.org/documents/38714170/39135332/03\\_Agribusiness\\_web.pdf/2d3fa83e-a8f5-4aa3-8c61-02f39e0b6589?eloutlink=imf2ifad](https://www.ifad.org/documents/38714170/39135332/03_Agribusiness_web.pdf/2d3fa83e-a8f5-4aa3-8c61-02f39e0b6589?eloutlink=imf2ifad).

Sy, Amadou N.R., Rodolfo Maino, Alexander Massara, Hector Perez-Saiz, and Preya Sharma. *Fintech in Sub-Saharan African Countries: A Game-changer?* International Monetary Fund, 2019. <https://www.imf.org/~media/Files/Publications/DP/2019/English/FTSSACEA.ashx>.

Syam, Nirmalya, and Viviana Muñoz Tellez. *Innovation and Global Intellectual Property Regulatory Regimes: The Tension between Protection and Access*. South Centre. Research Paper 67, June 2016. [https://www.southcentre.int/wp-content/uploads/2016/06/RP67\\_Innovation-and-Global-IP-Regulatory-Regimes\\_EN.pdf](https://www.southcentre.int/wp-content/uploads/2016/06/RP67_Innovation-and-Global-IP-Regulatory-Regimes_EN.pdf).

Takahashi, Dean. "Mastercard Tests Pay as You Go for Solar Energy in Africa." *VentureBeat*, February 26, 2018. <https://venturebeat.com/2018/02/26/mastercard-tests-pay-as-you-go-for-solar-energy-in-africa/>.

Taylor, Brian. "China Scrap Imports Decline after Tariffs on US Shipments." *Recycling Today*, October 24, 2018. <https://www.recyclingtoday.com/article/china-scrap-imports-recycling-september-2018/>.

Techloy. "How Microsoft's 4Afrika Program Is Empowering Startups in Nigeria." Medium, July 26, 2018. <https://medium.com/techloy/how-microsofts-4afrika-programme-is-empowering-startups-in-nigeria-c95f1a2bb292>.

Tefera, Delelegne A., Jos Bijman, and Maja A. Slingerland. "Multinationals and Modernisation of Domestic Value Chains in Africa: Case Studies from Ethiopia." *Journal of Development Studies*, vol. 56, no. 3 (March 25, 2019): 1–17. <https://doi.org/10.1080/00220388.2019.1590551>.

Tenneco Automotive Incorporated. "Catalytic Converters." [https://www.tenneco.com/catalytic\\_converters/](https://www.tenneco.com/catalytic_converters/) (accessed September 17, 2019).

Tenneco Incorporated. "Facilities Directory." [https://www.tenneco.com/global\\_presence/facilities\\_directory/](https://www.tenneco.com/global_presence/facilities_directory/) (accessed September 24, 2019).

Terazono, Emiko. "Chocolate Industry Accused of Failure on Child Labour." *Financial Times*, April 18, 2018. <https://www.ft.com/content/eb58ba84-425f-11e8-803a-295c97e6fd0b>.

Terazono, Emiko. "Choc Tactics: Ghana and Ivory Coast Plot 'Opec for Cocoa.'" *Financial Times*, July 19, 2019. <https://www.ft.com/content/0b45b450-a961-11e9-984c-fac8325aaa04>.

Thomas Net. "Top Aerospace/Aviation Companies and Manufacturers in the USA." <https://www.thomasnet.com/articles/top-suppliers/aerospace-companies-manufacturers/> (accessed September 23, 2019).

- Thompson, Alyse. "Blockchain for Cocoa? Maybe." *Candy Industry*, March 20, 2019. <https://www.candyindustry.com/articles/88585-blockchain-for-cocoa-maybe>.
- Times Higher Education* (THE). "World University Rankings 2017." *The World Universities Insights Limited* (UK), 2017. [https://www.timeshighereducation.com/world-university-rankings/2017/world-ranking#!/page/0/length/25/sort\\_by/rank/sort\\_order/asc/cols/stats](https://www.timeshighereducation.com/world-university-rankings/2017/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats).
- Tomás, Juan Pedro. "US to Lead Global IoT Spending in 2019, IDC Predicts." *Enterprise IoT Insights*, January 4, 2019. <https://enterpriseiotinsights.com/20190104/internet-of-things/us-lead-global-iot-spending-2019-194-billion-study>.
- Tomlinson, Catherine, John Ashmore, Anele Yawa, and Julia Hill. "Reforming South Africa's Procedures for Granting Patents to Improve Medicine Access." *South African Medical Journal* 105, no. 9, September 2015. [http://www.scielo.org.za/scielo.php?script=sci\\_arttext&pid=S0256-95742015000900018](http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0256-95742015000900018).
- Tong, Baldwin. "Africa: A Growing Middle Class." *World Data Lab* (blog) (British Indian Ocean Territory), April 25, 2019. <https://worlddata.io/blog/africa-a-growing-middle-class>.
- Tony's Chocolonely*. "Tony's Impact." <https://tonyschocolonely.com/us/en/our-mission/tonys-impact> (accessed October 14, 2019).
- Tony's Chocolonely*. "Transforming the Cocoa Industry." <https://www.chainpoint.com/our-customers/tonys-chocolonely/> (accessed July 26, 2019).
- Tordo, Silvana. "National Oil Companies and Value Creation." World Bank Working Papers, July 2011. <https://doi.org/10.1596/978-0-8213-8831-0>.
- Total. "Total Agrees with Occidental to Contingent Acquisition of Anadarko's Assets in Africa." Press release, May 5, 2019. <https://www.total.com/en/media/news/press-releases/total-agrees-occidental-contingent-acquisition-anadarkos-assets-africa>.
- Toto, DeAnne. "Aluminum Seeks Its Luster." *Recycling Today*, April 3, 2019. <https://www.recyclingtoday.com/article/aluminum-scrap-outlook/>.
- Trade Data Services, Inc. Import Genius database. <https://app.importgenius.com/> (accessed various dates).
- Trade Law Centre (Tralac) (South Africa). "AGOA and Botswana." December 21, 2018. <https://agoa.info/images/documents/15551/botswanacountrybrochureagoafinal.pdf>.
- Trade Law Centre (Tralac) (South Africa). *The African Continental Free Trade Area: A Tralac Guide 6th Edition*, June 2019. <https://www.tralac.org/publications/article/13997-african-continental-free-trade-area-a-tralac-guide.html>.
- Trade Law Centre (Tralac) (South Africa). "African Continental Free Trade Area (AfCFTA) Legal Texts and Policy Documents." <https://www.tralac.org/resources/by-region/cfta.html> (accessed August 8, 2019).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Trade Law Centre (Tralac) (South Africa). “Comesa to Set Up Team on Digital Free Trade Area.” July 26, 2018. <https://www.tralac.org/news/article/13303-comesa-to-set-up-team-on-digital-free-trade-area.html>.

Trade Law Centre (Tralac) (South Africa). “Conclusion of the Bilateral Tariff Negotiations between SACU and the EAC.” June 7, 2019. <https://www.tralac.org/news/article/14096-conclusion-of-the-bilateral-tariff-negotiations-between-sacu-and-the-eac.html>.

Trade Law Centre (Tralac) (South Africa). “The Institutional Arrangements of the Tripartite Free Trade Area.” *Tralac Blog*, September 13, 2019. <https://www.tralac.org/blog/article/14248-the-institutional-arrangements-of-the-tripartite-free-trade-area.html>.

Trade Law Centre (Tralac) (South Africa). “The Institutional Implications of Article 19 of the AfCFTA—Where Do the Regional Economic Communities Fit In?” *Tralac Blog*, September 13, 2019. <https://www.tralac.org/blog/article/14242-the-institutional-implications-of-article-19-of-the-afcfta-where-do-the-regional-economic-communities-fit-in.html>.

Trade Law Centre (Tralac) (South Africa). “Southern African Customs Union (SACU)’s Trade and Tariff Profile.” *Tralac Blog*, December 14, 2018. <https://www.tralac.org/blog/article/13807-southern-african-customs-union-sacu-s-trade-and-tariff-profile.html>.

Trade Law Centre (Tralac) (South Africa). “Trade Policy Review: East African Community (Burundi, Kenya, Rwanda, Tanzania and Uganda).” March 21, 2019. <https://www.tralac.org/news/article/13962-trade-policy-review-east-african-community-burundi-kenya-rwanda-tanzania-and-uganda.html>.

Tshabala, Subusiso. “In just 5 years, submarine cables have brought a 20-fold increase in bandwidth in Africa.” *Quartz Africa*, June 4, 2015. <https://qz.com/africa/420219/in-just-5-years-submarine-cables-have-brought-a-20-fold-increase-in-bandwidth-in-africa/>.

Tullett, Jonathan. “Disruptive Impact of Microsoft’s Launch of an Azure Region in South Africa.” *International Data Corporation (IDC) Market Note*, April 2019 (fee required).

Turner, Brian. “September 2018 Soybeans Prices Recap—Farmlead (Graincents).” *Farmlead* (blog), October 1, 2018. <https://farmlead.com/blog/insights/sep-2018-soybeans-prices-recap-graincents/>.

Turner, Elza. “Refinery News Roundup: So Far Muted Impact from Strikes in Europe.” January 6, 2020. <https://www.spglobal.com/platts/en/market-insights/latest-news/oil/010620-refinery-news-roundup-so-far-muted-impact-from-strikes-in-europe>.

Turner, Murray. “Friday Beer—Lagunitas Brewing Co IPA.” *Barley and Hops* (blog) (South Africa). September 21, 2018. <https://barleyandhops.co.za/2018/09/friday-beer-lagunitas-brewing-co-ipa/>.

UAS Vision. “Vayu’s Drones Deliver Healthcare in Rural Madagascar.” August 11, 2016. <https://www.uasvision.com/2016/08/11/vayus-drones-deliver-healthcare-in-rural-madagascar/>.

UAV Coach. “Master List of Drone Laws (Organized by State and Country).” <https://uavcoach.com/drone-laws/> (accessed May 31, 2019–July 2, 2019).

- UbuntuNet Alliance. "ITU Is Worried About High Cost of Broadband in Africa." December 1, 2016. <https://ubuntunet.net/2016/12/itu-is-worried-about-high-cost-of-broadband-in-africa/>.
- Ubwani, Zephania. "Ethiopian Airlines to Open Tanzania's Horticulture to the World." *The Citizen* (Tanzania), August 3, 2019. <https://www.thecitizen.co.tz/news/1840340-5221530-99ebew/index.html>.
- Undercurrent News. "Dongwon's Senegalese Tuna Plant Posts First Profit in Seven Years." April 30, 2018. <https://www.undercurrentnews.com/2018/04/30/dongwons-senegalese-tuna-plant-posts-first-profit-in-seven-years/>.
- Uniafrica. "The Dynamism in the African Beer Market." February 23, 2018. <https://www.uniafrica.org/the-dynamism-in-the-african-beer-market/?lang=en>.
- United Nations Capital Development Fund (UNCDF). "Financial Inclusion." <https://www.uncdf.org/financial-inclusion> (accessed January 21, 2020).
- United Nations Capital Development Fund (UNCDF). "Financial Inclusion and the SDGs." <https://www.uncdf.org/financial-inclusion-and-the-sdgs> (accessed January 21, 2020).
- United Nations Conference on Trade and Development (UNCTAD). "African Continental Free Trade Area: Policy and Negotiation Options for Trade in Goods." 2016. [https://unctad.org/en/PublicationsLibrary/webditc2016d7\\_en.pdf](https://unctad.org/en/PublicationsLibrary/webditc2016d7_en.pdf).
- United Nations Conference on Trade and Development (UNCTAD). "Classifications." [https://stats.unctad.org/handbook/Annexes/Classifications.html#ref\\_Unctad\\_2019a](https://stats.unctad.org/handbook/Annexes/Classifications.html#ref_Unctad_2019a) (accessed February 18, 2020).
- United Nations Conference on Trade and Development (UNCTAD). *Commodities at a Glance: Special Issue on Coffee in East Africa*. Commodities at a Glance Series, no. 10, September 2018. [https://unctad.org/en/PublicationsLibrary/ditccom2018d1\\_en.pdf](https://unctad.org/en/PublicationsLibrary/ditccom2018d1_en.pdf).
- United Nations Conference on Trade and Development (UNCTAD). "The Continental Free Trade Area: Making It Work for Africa." UNCTAD Policy Brief no. 44, December 2015. [http://unctad.org/en/PublicationsLibrary/presspb2015d18\\_en.pdf](http://unctad.org/en/PublicationsLibrary/presspb2015d18_en.pdf).
- United Nations Conference on Trade and Development (UNCTAD). "Data Protection and Privacy Legislation Worldwide." [https://unctad.org/en/Pages/DTL/STI\\_and\\_ICTs/ICT4D-Legislation/eCom-Data-Protection-Laws.aspx](https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Legislation/eCom-Data-Protection-Laws.aspx) (accessed November 19, 2019).
- United Nations Conference on Trade and Development (UNCTAD). *East African Community Regional Integration: Trade and Gender Implications*, 2018. [https://unctad.org/en/PublicationsLibrary/ditc2017d2\\_en.pdf](https://unctad.org/en/PublicationsLibrary/ditc2017d2_en.pdf).
- United Nations Conference on Trade and Development (UNCTAD). *Economic Development in Africa: Intra-African Trade; Unlocking Private Sector Dynamism*. New York and Geneva: UNCTAD, 2013. [http://unctad.org/en/PublicationsLibrary/aldcafrica2013\\_en.pdf](http://unctad.org/en/PublicationsLibrary/aldcafrica2013_en.pdf).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

United Nations Conference on Trade and Development (UNCTAD). *Economic Development in Africa Report 2019*, 2019. <https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2463>.

United Nations Conference on Trade and Development (UNCTAD). *Economic Development in Africa Report 2019: Made in Africa—Rules of Origin for Enhanced Intra-African Trade*. New York and Geneva: United Nations, June 2019. [https://unctad.org/en/PublicationsLibrary/aldcafrica2019\\_en.pdf](https://unctad.org/en/PublicationsLibrary/aldcafrica2019_en.pdf).

United Nations Conference on Trade and Development (UNCTAD). *Key Statistics and Trends in Regional Trade in Africa*. Geneva, Switzerland, 2019. [https://unctad.org/en/PublicationsLibrary/ditctab2019d3\\_en.pdf](https://unctad.org/en/PublicationsLibrary/ditctab2019d3_en.pdf).

United Nations Conference on Trade and Development (UNCTAD). “UNCTAD B2C E-commerce Index 2018; Focus on Africa.” 2018. [https://unctad.org/en/PublicationsLibrary/tn\\_unctad\\_ict4d12\\_en.pdf](https://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d12_en.pdf).

United Nations Conference on Trade and Development (UNCTAD). “UNCTAD-EORA Global Value Chain Database: Methodology and Further Research Agenda.” *Transnational Corporations* 21, no. 3 (2015): 57–75. [https://www.un-ilibrary.org/unctad-eora-global-value-chain-database-methodology-and-further-research-agenda\\_ec2b4828-en.pdf?itemId=%2Fcontent%2Fpaper%2Fec2b4828-en&mimeType=pdf](https://www.un-ilibrary.org/unctad-eora-global-value-chain-database-methodology-and-further-research-agenda_ec2b4828-en.pdf?itemId=%2Fcontent%2Fpaper%2Fec2b4828-en&mimeType=pdf).

United Nations Conference on Trade and Development (UNCTAD). “UNCTAD-Eora GVC Database 2018.” <https://worldmrio.com/unctadgvc/> (accessed October 21, 2019).

United Nations Conference on Trade and Development (UNCTAD). UNCTAD STAT database. “Merchandise: Intra-trade and Extra-trade of Country Groups by Product, Annual, 1995–2018.” [https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS\\_ChosenLang=en](https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en) (accessed September 27, 2019).

United Nations Conference on Trade and Development (UNCTAD). *World Investment Report 2019: Special Economic Zones*, 2019. <https://unctad.org/mwg-internal/de5fs23hu73ds/progress?id=ekNVc3uoYRkMQG9UCGWyXJ0lw6z0CR3IOXVWeYbtefU,&dl>.

United Nations Department of Economic and Social Affairs (UN DESA). *E-government Survey 2016*. New York: UN, August 2016. <https://www.un.org/development/desa/publications/2016-e-government-survey.html>.

United Nations Department of Economic and Social Affairs (UN DESA). *E-government Survey 2018*. New York: UN, July 2018. <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2018>.

United Nations Department of Economic and Social Affairs (UN DESA). “World Population Prospects 2019: Highlights.” June 17, 2019. <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>.

- United Nations Development Programme (UNDP). “Discussion Paper: Gains and Losses in Kenya’s Road towards African Integration.” July 2014.  
<https://www.undp.org/content/undp/en/home/librarypage/poverty-reduction/gains-and-losses-in-kenya-s-road-towards-african-integration.html>.
- United Nations Economic Commission for Africa (UNECA). “AMU—Arab Maghreb Union.”  
<https://www.uneca.org/oria/pages/amu-arab-maghreb-union> (accessed September 30, 2019).
- United Nations Economic Commission for Africa (UNECA). *Assessing Regional Integration in Africa IX: Next Steps for the African Continental Free Trade Area*. Addis Ababa, Ethiopia: UNECA, July 2019.  
<https://www.uneca.org/publications/assessing-regional-integration-africa-aria-ix>.
- United Nations Economic Commission for Africa (UNECA). “CEN-SAD—The Community of Sahel-Saharan States.” <https://www.uneca.org/oria/pages/regional-economic-communities> (accessed February 5, 2020).
- United Nations Economic Commission for Africa (UNECA). “ECA Policy Brief.” 2018.  
[https://www.uneca.org/sites/default/files/PublicationFiles/eca\\_policy\\_brief\\_promoting\\_fintech\\_start-ups\\_rev1.pdf](https://www.uneca.org/sites/default/files/PublicationFiles/eca_policy_brief_promoting_fintech_start-ups_rev1.pdf).
- United Nations Economic Commission for Africa (UNECA). *How ‘AGOA 2.0’ Could Be Different*. AGOA white paper, April 2014.  
[https://www.uneca.org/sites/default/files/PublicationFiles/agoa\\_white\\_paper-april-2014.pdf](https://www.uneca.org/sites/default/files/PublicationFiles/agoa_white_paper-april-2014.pdf).
- United Nations Economic Commission for Africa (UNECA) and International Growth Centre (IGC), Sierra Leone. *Sierra Leone National AGOA Response Strategy 2019 to 2025*, February 12, 2019.  
<https://agoa.info/images/documents/15571/sierra-leone-agoa-response-strategy-paper-final.pdf>.
- United Nations Educational, Scientific and Cultural Organization (UNESCO)/Institute for Statistics (UIS). Cultural Activities database. <http://uis.unesco.org/en/news/uis-releases-new-data-cultural-activities> (accessed August 15, 2019).
- United Nations Educational, Scientific, and Cultural Organization (UNESCO). Institute for Statistics database. <http://uis.unesco.org/> (accessed February 19, 2020).
- United Nations High Commissioner for Refugees (UNHCR). “Why Innovation and Technology Aren’t the Same.” March 13, 2017. <https://www.unhcr.org/innovation/innovation-technology-arent-the-same/>.
- United Nations Industrial Development Organization (UNIDO). *Agribusiness for Africa’s Prosperity*. Vienna, Austria: UNIDO, 2011. [http://www.unido.org/fileadmin/user\\_media/Services/Agro-Industries/Agribusiness\\_for\\_Africas\\_Prosperty\\_e-book\\_NEW.pdf](http://www.unido.org/fileadmin/user_media/Services/Agro-Industries/Agribusiness_for_Africas_Prosperty_e-book_NEW.pdf).
- United Nations Industrial Development Organization (UNIDO). *Global Value Chains in Africa*, 2015.  
<https://www.unido.org/api/opentext/documents/download/9928077/unido-file-9928077>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

United Nations Industrial Development Organization (UNIDO). *Industrial Development Report 2018. Demand for Manufacturing: Driving Inclusive and Sustainable Industrial Development*, 2017. [https://www.unido.org/sites/default/files/files/2017-11/IDR2018\\_FULL%20REPORT.pdf](https://www.unido.org/sites/default/files/files/2017-11/IDR2018_FULL%20REPORT.pdf).

United Nations Statistics Division (UNSD). “Table 9: List of countries, areas and geographical groupings.” [https://unstats.un.org/unsd/demographic-social/products/worldswomen/annex\\_tables/List%20of%20countries%20-%20Table%209.xls](https://unstats.un.org/unsd/demographic-social/products/worldswomen/annex_tables/List%20of%20countries%20-%20Table%209.xls) (accessed October 21, 2019).

United Nations World Tourism Organization (UNWTO). *World Tourism Barometer* 16, no. 3, June 2018. <http://marketintelligence.unwto.org/content/unwto-world-tourism-barometer>.

U.S. Agency for International Development (USAID). “Brief 1: What Is Agricultural Biotechnology?” *Agricultural Biotechnology Briefs*, 2004. [http://absp2.cornell.edu/resources/briefs/documents/warp\\_briefs\\_eng\\_scr.pdf](http://absp2.cornell.edu/resources/briefs/documents/warp_briefs_eng_scr.pdf).

U.S. Agency for International Development (USAID). “E-commerce Development Survey and Index.” April 2017. [https://pdf.usaid.gov/pdf\\_docs/PA00MP8T.pdf](https://pdf.usaid.gov/pdf_docs/PA00MP8T.pdf).

U.S. Agency for International Development (USAID). East Africa Trade and Investment Hub. “Burundi National AGOA Strategy Draft.” February 19, 2014. <https://agoa.info/images/documents/5944/burundiagoastrategyfinalfeb2014.pdf>.

U.S. Agency for International Development (USAID). East Africa Trade and Investment Hub. *Madagascar National AGOA Strategy*, April 9, 2019. <https://agoa.info/images/documents/5942/madagascarnationalagoastrategyapril2015.pdf>.

U.S. Agency for International Development (USAID). East Africa Trade and Investment Hub. *Mauritius National AGOA Strategy*, May 30, 2013. <https://agoa.info/images/documents/5945/mauritiusagoastrategyfinalmay2013.pdf>.

U.S. Agency for International Development (USAID). “East Africa Trade and Investment Hub. Textile and Apparel in Africa.” August 4, 2019. [https://www.eatradehub.org/textile\\_and\\_apparel\\_in\\_africa\\_ethiopia\\_s\\_impressive\\_growth\\_story](https://www.eatradehub.org/textile_and_apparel_in_africa_ethiopia_s_impressive_growth_story).

U.S. Agency for International Development (USAID). “New Ethiopia AGOA Strategy in Full Swing.” *East Africa Trade and Investment Hub* (blog), January 17, 2019. [https://www.eatradehub.org/new\\_ethiopia\\_agoa\\_strategy\\_in\\_full\\_swing](https://www.eatradehub.org/new_ethiopia_agoa_strategy_in_full_swing).

U.S. Agency for International Development (USAID) and Chemonics International. *Kenya—National AGOA Strategy 2012*, June 28, 2012. <https://agoa.info/images/documents/5943/kenyaagoastrategyfinaljune2012.pdf>.

U.S. Central Intelligence Agency (CIA). “Africa: Western Sahara.” *World Factbook*. <https://www.cia.gov/library/publications/the-world-factbook/geos/wi.html> (accessed January 27, 2020).

- U.S. Chamber of Commerce Global Intellectual Property Center (GIPC). Inspiring Tomorrow: U.S. Chamber International IP Index. 7th ed. Washington, DC: GIPC, February 2019. <https://www.theglobalipcenter.com/ipindex2019/>.
- U.S. Chamber of Commerce Global Intellectual Property Center (GIPC). "International IP Index 2020." <https://www.theglobalipcenter.com/ipindex2020/> (accessed January 21, 2020).
- U.S. Customs and Border Protection. "Forced Labor." <https://www.cbp.gov/trade/programs-administration/forced-labor> (accessed March 13, 2020).
- U.S. Department of Agriculture (USDA). "Agricultural Biotechnology Glossary." n.d. <https://www.usda.gov/topics/biotechnology/biotechnology-glossary> (accessed November 12, 2019).
- U.S. Department of Agriculture (USDA). "Biotechnology FAQs." November 12, 2019. <https://www.usda.gov/topics/biotechnology/biotechnology-frequently-asked-questions-faqs>.
- U.S. Department of Agriculture (USDA). Economic Research Service (ERS). "Fruit and Tree Nut Yearbook Tables: Supply and Utilization Tables." <https://www.ers.usda.gov/data-products/fruit-and-tree-nut-data/fruit-and-tree-nut-yearbook-tables/> (accessed August 27, 2019).
- U.S. Department of Agriculture (USDA). Economic Research Service (ERS). "Recent Trends in GE Adoption." Data Products. Adoption of Genetically Engineered Crops in the U.S., September 18, 2019. <https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx>.
- U.S. Department of Agriculture (USDA). Economic Research Service (ERS). "Risk in Agriculture." Farm Practices and Management. Risk Management, August 20, 2019. <https://www.ers.usda.gov/topics/farm-practices-management/risk-management/risk-in-agriculture.aspx>.
- U.S. Department of Agriculture (USDA). Economic Research Service (ERS). "The United States Is the World's Leading Poultry Exporter to Sub-Saharan Africa." by Fawzi Taha. *Amber Waves*, March 7, 2016. <https://www.ers.usda.gov/amber-waves/2016/march/the-united-states-is-the-world-s-leading-poultry-exporter-to-sub-saharan-africa/>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Angola: Angola Becomes Third Largest Market for U.S. Poultry*. International Agricultural Trade Reports, April 19, 2019. <https://www.fas.usda.gov/data/angola-angola-becomes-third-largest-market-us-poultry>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *A Turning Point for Agricultural Exports to Sub-Saharan Africa*. International Agricultural Trade Reports, November 2, 2015. <https://www.fas.usda.gov/data/turning-point-agricultural-exports-sub-saharan-africa>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *China—People's Republic of: Tree Nuts Annual; U.S. Tree Nuts to Lose Market Share in China due to Additional Tariffs*. GAIN Report No. CHI19061, September 12, 2019. <https://www.fas.usda.gov/data/china-tree-nuts-annual-3>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). Office of Global Analysis. *Coffee: World Markets and Trade*, December 2019. <https://www.fas.usda.gov/data/coffee-world-markets-and-trade>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). Global Agricultural Trade System, BICO (HS-10) Product Code 0040AT. <https://apps.fas.usda.gov/gats/default.aspx> (accessed Oct 15, 2019).
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Kenya: Grain and Feed Annual*, by Kennedy Gitonga. GAIN Report, March 21, 2017. <https://www.fas.usda.gov/data/kenya-grain-and-feed-annual-4>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Kenya: Tree Nuts Annual; Kenya Macadamia Annual Report*, by Mary Onsongo. GAIN Report no. KE9025, October 1, 2009. [https://gain.fas.usda.gov/Recent%20GAIN%20Publications/TREE%20NUTS%20ANNUAL\\_Nairobi\\_Kenya\\_10-1-2009.pdf](https://gain.fas.usda.gov/Recent%20GAIN%20Publications/TREE%20NUTS%20ANNUAL_Nairobi_Kenya_10-1-2009.pdf).
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Nigeria: Agricultural Biotechnology Annual, 2019*. GAIN Report no. NG19003, May 20, 2019. <https://www.fas.usda.gov/data/nigeria-agricultural-biotechnology-annual-3>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Nigeria Animal Feed Sector Snapshot—2019*, by Uche M. Nzeka and Mariano J. Beillard. GAIN Report no. NG-19005, May 2019. [https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Nigeria Animal Feed Sector Snapshot Lagos Nigeria 5-20-2019](https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Nigeria%20Animal%20Feed%20Sector%20Snapshot%20Lagos%20Nigeria%205-20-2019).
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Nigeria's Oilseeds and Products Annual 2019*, by Uche M. Nzeka, Jamie Haig, and Mariano J. Beillard. GAIN report no. NG-19008, July 2019. [https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Nigeria's Oilseeds and Products Annual 2019 Lagos Nigeria 7-29-2019](https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Nigeria's%20Oilseeds%20and%20Products%20Annual%202019%20Lagos%20Nigeria%207-29-2019).
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Oilseeds: World Markets and Trade*, November 2019. <https://usda.library.cornell.edu/concern/publications/tx31qh68h?locale=en>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). Production, Supply and Distribution (PSD) Online database. <https://apps.fas.usda.gov/psdonline/> (accessed multiple dates).
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *Prospects for U.S. Exports of Craft Beer Ingredients to South Africa*. GAIN Report no. SA1913, April 25, 2019. <https://www.fas.usda.gov/data/south-africa-prospects-us-exports-craft-beer-ingredients-south-africa>.

- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *South African Sugar Industry Crushed by Not So Sweet Tax*. GAIN Report no. SA1904, March 13, 2019. <https://www.fas.usda.gov/data/south-africa-south-african-sugar-industry-crushed-not-so-sweet-tax>.
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). *South Africa: The United States Fills the Chicken Meat Quota for Second Successive Year*, by Worship Mugido. GAIN Report no. SA 1918, May 29, 2019. <https://www.fas.usda.gov/data/south-africa-united-states-fills-chicken-meat-quota-second-successive-year>.
- U.S. Department of Agriculture (USDA). National Agricultural Statistics Service (NASS). *Hawaii Macadamia Nuts*. July 12, 2017. [https://www.nass.usda.gov/Statistics\\_by\\_State/Hawaii/Publications/Fruits\\_and\\_Nuts/072017MacNutFinal.pdf](https://www.nass.usda.gov/Statistics_by_State/Hawaii/Publications/Fruits_and_Nuts/072017MacNutFinal.pdf).
- U.S. Department of Agriculture (USDA). National Institute of Food and Agriculture (NIFA). "Precision, Geospatial and Sensor Technologies Programs." <https://nifa.usda.gov/program/precision-geospatial-sensor-technologies-programs> (accessed January 23, 2020).
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). Balance of Payments and Direct Investment Positions Database. <https://www.bea.gov/international/di1usdbal> (accessed August 5, 2019).
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). "Definition of International Services." October 2018. [https://www.bea.gov/international/international\\_services\\_definition.htm](https://www.bea.gov/international/international_services_definition.htm).
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). "Geographic Area Definitions." n.d. [https://apps.bea.gov/international/bp\\_web/geographic\\_area\\_definitions.pdf](https://apps.bea.gov/international/bp_web/geographic_area_definitions.pdf) (accessed August 8, 2019 and October 10, 2019).
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). Interactive data. International Services tables 2.1, 2.2, 2.3, 2.4, 3.1, 3.4, 4.1, 4.4, 5.1, October 19, 2019. <https://apps.bea.gov/iTable/iTable.cfm?reqid=62&step=9&isuri=1&6210=4>.
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). International Transactions, Services, & IIP, International Services, tables 3.1 and 3.3 (accessed November 13, 2019).
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). *NIPA Handbook: Concepts and Methods*, November 2017. <https://www.bea.gov/system/files/2019-12/All-Chapters.pdf>.
- U.S. Department of Commerce (USDOC). Bureau of Economic Analysis (BEA). *U.S. International Economic Accounts: Concepts and Methods*, June 2014. [https://www.bea.gov/international/concepts\\_methods.htm](https://www.bea.gov/international/concepts_methods.htm).
- U.S. Department of Commerce (USDOC). U.S. Commercial Service (CS). "Doing Business in Ethiopia: 2013 Country Commercial Guide for U.S. Companies." 2013. <https://photos.state.gov/libraries/ethiopia/956093/PDF%20Files/CCG-Ethiopia-Final.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- U.S. Department of Commerce (USDOC). U.S. Commercial Service (CS). “Doing Business in Ethiopia: 2014 Country Commercial Guide for U.S. Companies.” 2014. <https://photos.state.gov/libraries/ethiopia/956093/PDF%20Files/Country%20Commercial%20Guide%202014.pdf>.
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). “Commerce Official to Lead Department’s First Ever Education Trade Mission to Africa.” Press release, March 2, 2016. <https://legacy.trade.gov/press/press-releases/2016/commerce-official-to-lead-departments-first-ever-education-trade-mission-to-africa-030216.asp>.
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). “Ethiopia: Market Overview.” October 2019. [https://www.export.gov/article?series=a0pt0000000PAAtjAAG&type=Country\\_Commercial\\_kav](https://www.export.gov/article?series=a0pt0000000PAAtjAAG&type=Country_Commercial_kav).
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). “Ethiopia—Protecting Intellectual Property.” October 30, 2010. <https://www.trade.gov/knowledge-product/ethiopia-protecting-intellectual-property>.
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). Export.gov. “Angola—Agricultural Products.” August 22, 2019. <https://www.export.gov/article?id=Angola-Agricultural-Products>.
- U.S. Department of Commerce (USDOC). International Trade Agency (ITA). National Travel and Tourism Office. “2017 Top Destinations Visited by U.S. Resident Travelers 2016–2017.” Outbound Overview. Market Research. [https://travel.trade.gov/outreachpages/outbound.general\\_information.outbound\\_overview.asp](https://travel.trade.gov/outreachpages/outbound.general_information.outbound_overview.asp)
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). “Nigeria—Automotive.” August 13, 2019. <https://www.export.gov/article?id=Nigeria-Automobiles>.
- U.S. Department of Commerce (USDOC) International Trade Administration (ITA). “Nigeria—Import Tariffs.” August 13, 2019. <https://www.export.gov/article?id=Nigeria-Import-Tariffs>.
- U.S. Department of Commerce (USDOC). International Trade Agency (ITA). “U.S. Commercial Guide: Ethiopia.” 2017. <https://www.trade.gov/knowledge-product/ethiopia-market-overview?section-nav=4826>.
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). Office of Textiles and Apparel (OTEXA). “Major Shippers Report: *U.S. General Imports by Part Category*.” <https://otexa.trade.gov/scripts/tqads2.exe/ctrypage> (accessed September 5, 2019).
- U.S. Department of Commerce (USDOC). International Trade Administration (ITA). Office of Textiles and Apparel (OTEXA). “*Trade Preference Programs: The African Growth and Opportunity Act (AGOA)*.” [https://otexa.trade.gov/AGOA\\_Trade\\_Preference.htm](https://otexa.trade.gov/AGOA_Trade_Preference.htm) (accessed September 29, 2019).
- U.S. Department of Homeland Security (USDHS). U.S. Customs and Border Protection (CBP). “QB 18-136 2019 AGOA Limits.” <https://www.cbp.gov/trade/quota/bulletins/qb-18-136-2019-agoa-limits> (accessed November 7, 2019).

- U.S. Department of Labor (USDOL). "Survey Research on Child Labor in West African Cocoa Growing Areas." July 30, 2015. <https://www.dol.gov/agencies/ilab/final-report-survey-research-child-labor-west-african-cocoa-growing-areas>.
- U.S. Department of State (USDOS). "U.S. Relations with Morocco." October 4, 2019. <https://www.state.gov/u-s-relations-with-morocco/>.
- US Department of State (USDOS). Bureau of Consular Affairs (CA). "Alerts and Warnings." <https://travel.state.gov/content/passports/en/alertswarnings.html64.html> (accessed January 7, 2020).
- U.S. Department of State (USDOS). Bureau of Consular Affairs (CA). Nonimmigrant Visa Statistics: FY2016/2017/2018 NIV Detail Table, November 14, 2019. <https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics/nonimmigrant-visa-statistics.html> (accessed February 19, 2020).
- U.S. Department of State (USDOS). Bureau of Consular Affairs (CA). Visa Statistics 2016, 2017, 2018. <https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics.html> (accessed February 19, 2020).
- U.S. Department of Transportation (USDOT). Bureau of Transportation Statistics (BTS). "T-100 International Market (U.S. Carriers Only)." Air Carrier Statistics (Form 41 Traffic), U.S. Carriers database. [https://www.transtats.bts.gov/Tables.asp?DB\\_ID=110&DB\\_Name=Air%20Carrier%20Statistics%20%28Form%2041%20Traffic%29-%20%20U.S.%20Carriers&DB\\_Short\\_Name=Air%20Carriers](https://www.transtats.bts.gov/Tables.asp?DB_ID=110&DB_Name=Air%20Carrier%20Statistics%20%28Form%2041%20Traffic%29-%20%20U.S.%20Carriers&DB_Short_Name=Air%20Carriers) (accessed August 23, 2019).
- U.S. Energy Information Administration (EIA). *Annual Energy Outlook 2019*, January 24, 2019. <https://www.eia.gov/outlooks/aeo/>.
- U.S. Energy Information Administration (EIA). "Crude Oil Prices Increased in 2017, and Brent-WTI Spread Widened." *Today in Energy*, January 3, 2018. <https://www.eia.gov/todayinenergy/detail.php?id=34372>.
- U.S. Energy Information Administration (EIA). "Crude Oil Production." Petroleum and Other Liquids database. [https://www.eia.gov/dnav/pet/pet\\_crd\\_crpdn\\_adc\\_mbbldpd\\_m.htm](https://www.eia.gov/dnav/pet/pet_crd_crpdn_adc_mbbldpd_m.htm) (accessed various dates).
- U.S. Energy Information Administration (EIA). "Exports by Destination." Petroleum and Other Liquids database. [https://www.eia.gov/dnav/pet/pet\\_move\\_expc\\_a\\_EPM0F\\_EEX\\_mbbldpd\\_a.htm](https://www.eia.gov/dnav/pet/pet_move_expc_a_EPM0F_EEX_mbbldpd_a.htm) (accessed various dates).
- U.S. Energy Information Administration (EIA). "Hydrocracking is an Important Source of Diesel and Jet Fuel." January 18, 2013. <https://www.eia.gov/todayinenergy/detail.php?id=9650>.
- U.S. Energy Information Administration (EIA). "More Stringent Marine Sulfur Limits Mean Changes for U.S. Refiners and Ocean Vessels." *Today in Energy*, February 4, 2019. <https://www.eia.gov/todayinenergy/detail.php?id=38233>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- U.S. Energy Information Administration (EIA). "Natural Gas Explained: Use of Natural Gas." July 10, 2019. <https://www.eia.gov/energyexplained/natural-gas/use-of-natural-gas.php>.
- U.S. Energy Information Administration (EIA). "Natural Gas Plant Field Production." Petroleum and Other Liquids Database. [https://www.eia.gov/dnav/pet/pet\\_pnp\\_gp\\_a\\_EPLLBAN\\_FPF\\_mbb1\\_a.htm](https://www.eia.gov/dnav/pet/pet_pnp_gp_a_EPLLBAN_FPF_mbb1_a.htm) (accessed various dates).
- U.S. Energy Information Administration (EIA). "Natural Gas Spot and Futures Prices (NYMEX)." Natural Gas database. [https://www.eia.gov/dnav/ng/ng\\_pri\\_fut\\_s1\\_a.htm](https://www.eia.gov/dnav/ng/ng_pri_fut_s1_a.htm) (accessed various dates).
- U.S. Energy Information Administration (EIA). "Oil: Crude and Petroleum Products Explained." May 23, 2019. <https://www.eia.gov/energyexplained/oil-and-petroleum-products/>.
- U.S. Energy Information Administration (EIA). "Refinery and Blender Net Production." Petroleum and Other Liquids Database. [https://www.eia.gov/dnav/pet/PET\\_PNP\\_REFP\\_A\\_EPLLBAN\\_YPR\\_MBB1\\_A.htm](https://www.eia.gov/dnav/pet/PET_PNP_REFP_A_EPLLBAN_YPR_MBB1_A.htm) (accessed various dates).
- U.S. Energy Information Administration (EIA). "South Africa." October 26, 2017. <https://www.eia.gov/beta/international/analysis.php?iso=ZAF>.
- U.S. Energy Information Administration (EIA). "Spot Prices." Petroleum and Other Liquids database. [https://www.eia.gov/dnav/pet/pet\\_pri\\_spt\\_s1\\_a.htm](https://www.eia.gov/dnav/pet/pet_pri_spt_s1_a.htm) (accessed various dates).
- U.S. Energy Information Administration (EIA). *Trends in U.S. Oil and Natural Gas Upstream Costs*, March 2016. <https://www.eia.gov/analysis/studies/drilling/>.
- U.S. Energy Information Administration (EIA). "U.S. Imports by Country of Origin." Petroleum and Other Liquids Database. [https://www.eia.gov/dnav/pet/pet\\_move\\_impcus\\_a2\\_nus\\_ep00\\_im0\\_mbb1\\_m.htm](https://www.eia.gov/dnav/pet/pet_move_impcus_a2_nus_ep00_im0_mbb1_m.htm) (accessed various dates).
- U.S. Environmental Protection Agency (USEPA). National Service Center for Environmental Publications. "What you Should Know About Using, Installing, or Buying Aftermarket Catalytic Converters." <https://nepis.epa.gov/Exe/ZyNET.exe/P100TSYK.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2000+Thru+2005&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C00thru05%5Ctxt%5C00000037%5CP100TSYK.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL> (accessed September 15, 2019).
- U.S. Geological Survey (USGS). "2015 Minerals Yearbook: Ferroalloys." 2018. <https://s3-us-west-2.amazonaws.com/prd-wret/assets/palladium/production/mineral-pubs/ferroalloys/myb1-2015-feall.pdf>.

- U.S. Geological Survey (USGS). "2016 Minerals Yearbook: Zinc." 2018. <https://s3-us-west-2.amazonaws.com/prd-wret/assets/palladium/production/mineral-pubs/zinc/myb1-2016-zinc.pdf>.
- U.S. Geological Survey (USGS). "Manganese." *Mineral Commodity Summaries*, 2020. <https://s3-us-west-2.amazonaws.com/pubs.usgs.gov/periodicals/mcs2020/mcs2020-manganese.pdf>.
- U.S. Geological Survey (USGS). "Mineral Commodity Summaries: Chromium." 2018. <https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/atoms/files/mcs-2018-chrom.pdf>.
- U.S. Geological Survey (USGS). "Mineral Commodity Summaries: Chromium." 2019. <https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/s3fs-public/atoms/files/mcs-2019-chrom.pdf>.
- U.S. Geological Survey (USGS). "Mineral Commodity Summaries: Manganese." 2019. <https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/atoms/files/mcs-2019-manga.pdf>.
- U.S. Geological Survey (USGS). Mineral Commodity Summaries. *Titanium Minerals and Concentrates 2019*, by George M. Bedinger, February 2019. <https://www.usgs.gov/centers/nmic/titanium-statistics-and-information>.
- U.S. Geological Survey (USGS). "Mineral Commodity Summaries: Zinc." 2019. <https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/atoms/files/mcs-2019-zinc.pdf>.
- U.S. Government Publishing Office (USGPO). *Federal Register*. "Determinations under the African Growth and Opportunities Act." <https://www.federalregister.gov/documents/2014/12/15/2014-29169/determinations-under-the-african-growth-and-opportunity-act>.
- U.S. Government Publishing Office (USGPO). Trade and Development Act of 2000. Pub. L. 106-200, Sec. 105. <https://www.govinfo.gov/app/details/PLAW-106publ200>.
- U.S. Government Publishing Office (USGPO). Trade Preferences Extension Act of 2015. Pub. L. 114-27, 129 Stat. 368. June 29, 2015. <https://www.congress.gov/bill/114th-congress/house-bill/1295/text>.
- U.S. Government Publishing Office (USGPO). Trade Preferences Extension Act of 2015, January 6, 2015. <https://www.gpo.gov/fdsys/pkg/BILLS-114hr1295enr/pdf/BILLS-114hr1295enr.pdf>.
- U.S. International Trade Commission (USITC). *AGOA: Trade and Investment Performance Overview*. USITC Publication 4461. Washington, DC: USITC, 2014. [https://usitc.gov/publications/industry\\_econ\\_analysis\\_332/2014/agoa\\_trade\\_and\\_investment\\_performance\\_overview.htm](https://usitc.gov/publications/industry_econ_analysis_332/2014/agoa_trade_and_investment_performance_overview.htm).
- U.S. International Trade Commission (USITC). *China's Agricultural Trade: Competitive Conditions and Effects on U. S. Exports*. USITC Publication 4219. Washington, DC: USITC, 2011. <https://www.usitc.gov/publications/332/pub4219.pdf>.

U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

U.S. International Trade Commission (USITC). *Generalized System of Preferences: Possible Modifications, 2018 Review*. USITC Publication 4972. Washington, DC: USITC, September 2019.  
<https://www.usitc.gov/sites/default/files/publications/332/pub4972.pdf>.

U.S. International Trade Commission (USITC). *Global Digital Trade I: Market Opportunities and Key Foreign Trade Restrictions*. USITC Publication 4716. Washington, DC: USITC, August 2017.  
[https://www.usitc.gov/sites/default/files/publications/332/pub4716\\_0.pdf](https://www.usitc.gov/sites/default/files/publications/332/pub4716_0.pdf).

U.S. International Trade Commission (USITC). Hearing transcript in connection with Inv. No. 332-571, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments*, July 24, 2019. <https://www.usitc.gov/publications/332/pub4780.pdf>.

U.S. International Trade Commission (USITC). Hearing transcript in connection with Inv. No. 332-572, *Generalized System of Preferences: Possible Modifications, 2018 Review*, July 3, 2019.

U.S. International Trade Commission (USITC). Interactive Tariff and Trade DataWeb (DataWeb)/U.S. Department of Commerce (USDOC). <https://dataweb.usitc.gov> (accessed various dates).

U.S. International Trade Commission (USITC). *Macadamia Nuts: Economic and Competitive Factors Affecting the U.S. Industry*. USITC Publication 2573. Washington, DC: USITC, November 1992.  
<https://www.usitc.gov/publications/332/pub2573.pdf>.

U.S. International Trade Commission (USITC). *Polyethylene Terephthalate (PET) Resin from Canada, China, India, and Oman*. Investigation Nos. 701-TA-531-532 and 731-TA-1270-1273 (Final). USITC Publication 4604. Washington, DC: USITC, April 2016.  
[https://www.usitc.gov/publications/701\\_731/pub4604.pdf](https://www.usitc.gov/publications/701_731/pub4604.pdf).

U.S. International Trade Commission (USITC). *Polyethylene Terephthalate Resin from Brazil, Indonesia, Korea, Pakistan, and Taiwan*. Investigation Nos. 731-TA-1387–1391 (Final). USITC Publication 4835. Washington, DC: USITC, November 2018.  
[https://www.usitc.gov/publications/701\\_731/pub4835.pdf](https://www.usitc.gov/publications/701_731/pub4835.pdf).

U.S. International Trade Commission (USITC). *Recent Trends in U.S. Services Trade: 2017 Annual Report*. Publication 4682. Washington, DC: USITC 2017.  
<https://www.usitc.gov/publications/332/pub4682.pdf>.

U.S. International Trade Commission (USITC). *Recent Trends in U.S. Services Trade: 2018 Annual Report*. USITC Publication 4789. Washington, DC: USITC, June 2018.  
<https://www.usitc.gov/publications/332/pub4789.pdf>.

U.S. International Trade Commission (USITC). *Recent Trends in U.S. Services Trade: 2019 Annual Report*. USITC Publication 4975. Washington, DC: USITC, September 2019.  
<https://www.usitc.gov/publications/332/pub4975.pdf>.

U.S. International Trade Commission (USITC). *Shifts in U.S. Merchandise Trade 2015*. USITC Publication 4641. Washington, DC: USITC, September 2016.  
[https://www.usitc.gov/research\\_and\\_analysis/trade\\_shifts\\_2015/index.htm](https://www.usitc.gov/research_and_analysis/trade_shifts_2015/index.htm) (accessed various dates).

- U.S. International Trade Commission (USITC). *Shifts in U.S. Merchandise Trade, 2018*. USITC Publication 5012. Washington, DC: USITC, December 2019. [https://www.usitc.gov/research\\_and\\_analysis/trade\\_shifts\\_2018/index.htm](https://www.usitc.gov/research_and_analysis/trade_shifts_2018/index.htm).
- U.S. International Trade Commission (USITC). *Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report*. USITC Publication 4071. Washington, DC: USITC, 2009. <https://www.usitc.gov/publications/332/pub4071.pdf>.
- U.S. International Trade Commission (USITC). "The Sub-Saharan African Services Economy: Insights and Trends." USITC Working Paper ID-0467. Washington, DC: USITC, July 2017. [https://www.usitc.gov/publications/332/sub-saharan\\_african\\_id-17-046\\_final\\_071217sae.pdf](https://www.usitc.gov/publications/332/sub-saharan_african_id-17-046_final_071217sae.pdf).
- U.S. International Trade Commission (USITC). *The Year in Trade 2018*. USITC Publication 4986. Washington, DC: USITC, October 2019. <https://www.usitc.gov/publications/332/pub4986.pdf>.
- U.S. International Trade Commission (USITC). *U.S.-Mexico-Canada Trade Agreement: Likely Impact on the U.S. Economy and on Specific Industry Sectors*. USITC Publication 4889. Washington, DC: USITC, April 2019. <https://www.usitc.gov/publications/332/pub4889.pdf>.
- U.S. International Trade Commission (USITC). *U.S. Trade and Investment with Sub-Saharan Africa: Recent Developments*. USITC Publication 4780. Washington, DC: USITC, April 2018. <https://www.usitc.gov/publications/332/pub4780.pdf>.
- U.S. Securities and Exchange Commission (SEC). "Jumia Technologies AG, Form F-1, Prospectus." March 12, 2019. <https://www.sec.gov/Archives/edgar/data/1756708/000119312519071692/d650749df1.htm>.
- U.S. Securities and Exchange Commission (SEC). "Jumia Technologies Registration Statement Form F-1." March 12, 2019. <https://www.sec.gov/Archives/edgar/data/1756708/000119312519071692/d650749df1.htm>.
- U.S. Trade Representative (USTR). *2016 Biennial Report on the Implementation of the Africa Growth and Opportunity Act*. Washington, DC: USTR, June 2016. <https://ustr.gov/sites/default/files/2016-AGOA-Implementation-Report.pdf>.
- U.S. Trade Representative (USTR). *2018 Biennial Report on the Implementation of the African Growth and Opportunity Act*. Washington, DC: USTR, June 29, 2018. [https://ustr.gov/sites/default/files/2018\\_AGOA\\_Implementation.pdf](https://ustr.gov/sites/default/files/2018_AGOA_Implementation.pdf).
- U.S. Trade Representative (USTR). *2019 Special 301 Report*, April 2019. [https://ustr.gov/sites/default/files/2019\\_Special\\_301\\_Report.pdf](https://ustr.gov/sites/default/files/2019_Special_301_Report.pdf).
- U.S. Trade Representative (USTR). *Annual Review of Country Eligibility for Benefits under AGOA*, July 6, 2018. [https://ustr.gov/sites/default/files/2018\\_AGOA\\_Implementation.pdf](https://ustr.gov/sites/default/files/2018_AGOA_Implementation.pdf).
- U.S. Trade Representative (USTR). *Beyond AGOA: Looking to the Future of U.S.-Africa Trade and Investment*, September 2016. <https://ustr.gov/sites/default/files/2016-AGOA-Report.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- U.S. Trade Representative (USTR). "Fact Sheet: African Growth and Opportunity Act: 2018 Biennial Report." <https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2018/june/fact-sheet-african-growth-and-opportunity> (accessed December 20, 2019).
- U.S. Trade Representative (USTR). "Morocco Free Trade Agreement." <https://ustr.gov/trade-agreements/free-trade-agreements/morocco-fta> (accessed October 08, 2019).
- U.S. Trade Representative (USTR). *National Trade Estimate and Foreign Trade Barriers Report*, 2011. <https://ustr.gov/sites/default/files/files/Press/Reports/2018%20National%20Trade%20Estimate%20Report.pdf>.
- U.S. Trade Representative (USTR). *National Trade Estimate and Foreign Trade Barriers Report*, 2013. <https://ustr.gov/sites/default/files/2013%20NTE.pdf>.
- U.S. Trade Representative (USTR). *National Trade Estimate and Foreign Trade Barriers Report*, 2019. [https://ustr.gov/sites/default/files/2019\\_National\\_Trade\\_Estimate\\_Report.pdf](https://ustr.gov/sites/default/files/2019_National_Trade_Estimate_Report.pdf).
- U.S. Trade Representative (USTR). "President Obama Removes Swaziland, Reinstates Madagascar for AGOA Benefits." Press release, June 26, 2014. <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2014/June/President-Obama-removes-Swaziland-reinstates-Madagascar-for-AGOA-Benefits>.
- U.S. Trade Representative (USTR). "Statement of USTR Robert Lighthizer at the Opening Plenary of the 2018 U.S.-Sub-Saharan Africa Trade and Economic Cooperation Forum (AGOA Forum)." Press release, July 11, 2018. <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2018/july/statement-ustr-robert-lighthizer-0>.
- U.S. Trade Representative (USTR). "West African Economic and Monetary Union." <https://ustr.gov/countries-regions/africa/regional-economic-communities-rec/west-african-economic-and-monetary-union-uemoa> (accessed October 08, 2019).
- University of California, Davis (UCD). Center for Consumer Research (CCR). "Benefits of Biotechnology." June 28, 2017. <https://ccr.ucdavis.edu/biotechnology/benefits-biotechnology>.
- University of Illinois Extension. "Hybrids and Heirlooms." by Barbara Larson. *Home Hort Hints*, February–March 2001. <https://web.extension.illinois.edu/hortihints/0102a.html>.
- University of Montana. Maureen and Mike Mansfield Center. Ethics and Public Affairs Program. "Bt Cotton: Explanation." n.d. <http://www.umt.edu/ethics/debating%20science%20program/odc/Biotechnology/Alternatives/Bt%20Cotton1/default.php> (accessed November 12, 2019).
- University of Witwatersrand. "Overview: Carbides and Cermets." <https://www.wits.ac.za/strongmaterials/focus-areas/carbides-and-cermets/> (accessed September 25, 2019).

- Van Oss, Hendrick G., and Philip M. Mobbs. "The Mineral Industry of South Africa." *Minerals Yearbook 1993*, vol. 3. Washington, DC: U.S. Bureau of Mines, 1993. <http://digicoll.library.wisc.edu/cgi-bin/EcoNatRes/EcoNatRes-idx?type=article&did=EcoNatRes.MinYB1993v3Afr.HvanOss4&id=EcoNatRes.MinYB1993v3Afr&size=M>.
- Van Zyl, Gareth. "No More Manhattan for Modderfontein: Chinese Megacity a Non-starter." *Biznews*, March 7, 2019. <https://www.biznews.com/thought-leaders/2019/03/07/manhattan-modderfontein-chinese-megacity-non-starter>.
- Vedanta Limited. "Consolidated Financial Statement—Form 20F." July 14, 2019. <https://www.vedantalimited.com/InvestorReports/VEDL%2020F%20Fy'19.pdf>.
- Velluet, Quentin. "PayPal Enters the African Market with Xoom." *Africa Report*, August 14, 2019. <https://www.theafricareport.com/16251/paypal-enters-the-african-market-with-xoom/>.
- Venter, Irma. "New-look APDP Could Change Face of the Local Auto Industry." *Engineering News*, February 1, 2019. [https://www.engineeringnews.co.za/article/driving-force-2019-02-01/rep\\_id:4136](https://www.engineeringnews.co.za/article/driving-force-2019-02-01/rep_id:4136).
- Ventureburn. "Kenya's CMA Admits Three Fintechs to Regulatory Sandbox." August 1, 2019. <https://ventureburn.com/2019/08/kenya-fintechs-admitted-regulatory-sandbox/>.
- Veras, Otavio. "Smart Cities in Africa: Nairobi and Cape Town." *How We Made It in Africa*, April 10, 2017. <https://www.howwemadeitinafrica.com/smart-cities-africa-nairobi-cape-town/58209/>.
- Verma, Ashish Swarup, Shishir Agrahari, Shruti Rastogi, and Anchal Singh. "Biotechnology in the Realm of History." *Journal of Pharmacy and Bioallied Sciences* 3, no. 3 (2011): 321–23. <https://doi.org/10.4103/0975-7406.84430>.
- Vidija, Patrick. "US, Kenya Add All-Cargo Rights to Air Transport Agreement." *The Star (Kenya)*, February 6, 2020. <https://www.the-star.co.ke/news/2020-02-06-us-kenya-add-all-cargo-rights-to-air-transport-agreement/>.
- Vidooly. "Most Subscribed YouTube Channels in Nigeria." <https://vidooly.com/top-YouTube-channels/NG/mostsubscribed> (accessed October 7, 2019).
- Visa. "Visa Takes Everywhere Startup Program to Sub-Saharan Africa." *Finextra*, March 14, 2018. <https://www.finextra.com/pressarticle/73020/visa-takes-everywhere-startup-programme-to-sub-saharan-africa>.
- Vodafone. "Vodafone Foundation Helps Save Mothers' and Children's Lives in One of the World's Worst HIV Hotspots." Press release, November 30, 2016. <https://www.vodafone.com/content/index/media/vodafone-group-releases/2016/foundation-helps-save.html>.
- VOICE Network (EU). *2018 Cocoa Barometer*, April 19, 2018. <https://www.voicenetwork.eu/wp-content/uploads/2019/07/2018-Cocoa-Barometer.pdf>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Volz, Matthew. "South African Company Acquires Stillwater Mining Co." *Flathead Beacon* (Kalispell, Montana), May 4, 2017. <https://flatheadbeacon.com/2017/05/04/south-african-company-acquires-stillwater-mining-co/>.
- Wadhams, Nick. "U.S. Says No Change in Plans to Halt Iranian Oil Waivers." *Bloomberg*, May 30, 2019. <https://www.bloomberg.com/news/articles/2019-05-30/state-department-says-no-change-in-plan-to-end-iran-oil-waivers>.
- Wallace, Paul. "Nigeria's Central Bank Finally Throws In Towel on Naira Peg." *Bloomberg*, June 15, 2016. <https://www.bloomberg.com/news/articles/2016-06-14/nigeria-central-bank-to-announce-new-currency-policy-wednesday>.
- Walsh, Michael P. "Moving toward Clean Vehicles and Fuels: A Global Overview." *EM Magazine*, June 2009. <https://walshcarlines.com/pdf/AWMAwalsh.pdf>.
- Wang, Ping Ya. "No Slums and a 'Vision City': An Impression of Kigali's Housing from My First Fieldtrip." Centre for Sustainable Healthy and Learning Cities and Neighborhoods, September 2, 2019. <http://www.centreforsustainablecities.ac.uk/news/slums-vision-city-kigali-housing/>.
- Wards Intelligence. "South African Vehicle Production by Manufacturer, 2014–2018." Data sheet, July 5, 2019. <https://subscribers.wardsintelligence.com/datasheet/south-africa-vehicle-production-manufacturer-2014-2018>.
- Wards Intelligence. *Wards Automotive Yearbook 2019*, 2019.
- Warren, Tom. "Google Invests \$22 Million in the OS Powering Nokia Feature Phones." *The Verge*, June 28, 2019. <https://www.theverge.com/2018/6/28/17513036/google-kaios-investment-feature-phones-firefox-os-apps-services-strategy>.
- Watabaji, Mulugeta, Adrienn Molnar, and Xavier Gellynck. "Integrative Role of Value Chain Governance: Evidence from the Malt Barley Value Chain in Ethiopia." *Journal of the Institute of Brewing* 122, no. 4 (November 2, 2016) 670–81. <https://onlinelibrary.wiley.com/doi/full/10.1002/jib.378>.
- Weetracker. *African Venture Capital 2018 Report—USD 725.6 Mn Invested in 458 Deals*, January 4, 2019. <https://weetracker.com/2019/01/04/what-a-year-the-state-of-venture-capital-in-africa-2018/>.
- Weigart, Maxime. "How the Private Sector Is Shaping African E-commerce." International Center for Trade and Sustainable Development, *Bridges Africa*, March 14, 2018. <https://www.ictsd.org/bridges-news/bridges-africa/news/how-the-private-sector-is-shaping-african-e-commerce>.
- Wells Fargo. "Semiconductor Industry Primer." September 15, 2017. <https://www.scribd.com/document/380802025/Wells-Fargo-Semiconductor-primer-pdf>.
- West African Economic and Monetary Union (WAEMU). "About UEMOA." <http://www.uemoa.int/en/about-uemoa> (accessed September 30, 2019).

- White, Lawrence. "JPMorgan Plans Expansion into Ghana and Kenya." Reuters, January 24, 2018. <https://www.reuters.com/article/us-davos-meeting-jpmorgan-africa/jpmorgan-plans-expansion-into-ghana-and-kenya-idUSKBN1FD23R>.
- WholeFoods Magazine*. "Green and Gold Macadamias Invests in Macadamia Innovation." May 6, 2019. <https://wholefoodsmagazine.com/suppliers/news-suppliers/green-gold-macadamias-invest-in-macadamia-innovation/>.
- Whoriskey, Peter. "Chocolate Companies Sell 'Certified Cocoa.' But Some of Those Farms Use Child Labor, Harm Forests." *Washington Post*, October 23, 2019. <https://www.washingtonpost.com/business/2019/10/23/chocolate-companies-say-their-cocoa-is-certified-some-farms-use-child-labor-thousands-are-protected-forests/>.
- Whoriskey, Peter, and Rachel Siegel. "Hershey, Nestle and Mars Won't Promise Their Chocolate Is Free of Child Labor." *Washington Post*, June 5, 2019. <https://www.washingtonpost.com/graphics/2019/business/hershey-nestle-mars-chocolate-child-labor-west-africa/>.
- Willuhn, Marian. "Smart Grids Way Forward for Sub-Saharan Africa—Report." *PV Magazine*, July 20, 2018. <https://www.pv-magazine.com/2018/07/20/smart-grids-way-forward-for-sub-saharan-africa-report/>.
- Wilson, Tom. "Ethiopia Takes First Step Towards Liberalizing Finance Sector." *Financial Times*, August 8, 2019. <https://www.ft.com/content/cca86246-b9dd-11e9-8a88-aa6628ac896c>.
- Wilson, Tom. "Kenyan Cooking Start-up Uses Tech to Cut Costs and Save Lives." *Financial Times*, November 1, 2019. <https://www.ft.com/content/c7c62ca6-d556-11e9-8d46-8def889b4137>.
- Wilson, Tom. "Pioneering Kenya Eyes Next Stage of Mobile Money." *Financial Times*, April 23, 2019. <https://www.ft.com/content/130fe0cc-4b36-11e9-bde6-79eaea5acb64>.
- Woodhams, Samuel, and Migliano, Simon. "The Global Cost of Internet Shutdowns in 2019." Top 10 VPN, January 7, 2020. <https://www.top10vpn.com/cost-of-internet-shutdowns/>.
- Woolfrey, Sean, and San Bilal. "The Impact of Economic Partnership Agreements on the Development of African Value Chains." European Centre for Development Policy Management (ECDPM), June 2017. <https://ecdpm.org/wp-content/uploads/DP213-Impact-EPAs-African-Value-Chains.pdf>.
- World Bank. "Agriculture and Climate Risk Enterprise (ACRE): Kilimo Salama—Kenya, Rwanda, Tanzania." Partner Profiles, Global Index Insurance Facility. <http://documents.worldbank.org/curated/en/858031490693709582/pdf/113740-BRI-PartnerProfiles-ACRE-PUBLIC.pdf> (accessed August 22, 2019).
- World Bank. *Doing Business 2019: Training for Reform*, 2019. [https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report\\_web-version.pdf](https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB2019-report_web-version.pdf).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- World Bank. [Doing Business Measuring Business Regulations: Economy Rankings](https://www.doingbusiness.org/en/reports/global-reports/doing-business-2020). <https://www.doingbusiness.org/en/reports/global-reports/doing-business-2020> (accessed September 25, 2019).
- World Bank. *Global Consumption Database*. <http://datatopics.worldbank.org/consumption/detail> (accessed November 20, 2019).
- World Bank. “Global Findex Database 2017.” August 2018. <https://globalfindex.worldbank.org/sites/globalfindex/files/2018-08/Global%20Findex%20Database.xlsx>.
- World Bank. “Mozambique to Increase Financial Inclusion and Stability with World Bank Support.” Press release, December 13, 2018. <https://www.worldbank.org/en/news/press-release/2018/12/13/mozambique-to-increase-financial-inclusion-and-stability-with-world-bank-support>.
- World Bank. “The Race for Universal Energy Access Speeds Up.” July 20, 2018. <https://www.worldbank.org/en/news/feature/2018/07/10/the-race-for-universal-energy-access-speeds-up>.
- World Bank. “Remittance Prices Worldwide.” <https://remittanceprices.worldbank.org/en> (accessed August 26, 2019).
- World Bank. *Tourism in Africa: Harnessing Tourism for Growth and Improved Livelihoods*. Report overview, 2013. <http://www.worldbank.org/content/dam/Worldbank/document/Africa/Report/africa-tourism-report-2013-overview.pdf>.
- World Bank. “World Bank Analytical Classifications: Historical Classification by Income.” <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> (accessed September 3, 2019).
- World Bank. “World Bank Country and Lending Groups: Historical Classification by Income.” Database. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> (accessed February 13, 2020).
- World Bank. World Development Indicators. “Account Ownership at a Financial Institution or with a Mobile-Money-service Provider (% of Population Ages 15+).” <https://data.worldbank.org/indicator/FX.OWN.TOTL.ZS> (accessed October 28, 2019).
- World Bank. World Development Indicators. “Average transaction cost of sending remittances to a specific country (%).” <https://data.worldbank.org/indicator/FX.OWN.TOTL.ZS> (accessed February 13, 2020).
- World Bank. World Development Indicators. “Current Health Expenditure (% of GDP).” <https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?locations=NG-ZA-GH-KE> (accessed September 9, 2019).

- World Bank. World Development Indicators. "Domestic Credit Provided by Financial Sector (% of GDP)." <https://data.worldbank.org/indicator/FS.AST.DOMS.GD.ZS> (accessed October 28, 2019).
- World Bank. World Development Indicators. "GDP (Current US\$)." <https://databank.worldbank.org/source/world-development-indicators> (accessed November 18, 2019).
- World Bank. World Development Indicators. "GDP Growth (Annual %)." <https://databank.worldbank.org/source/world-development-indicators> (accessed November 18, 2019).
- World Bank. World Development Indicators. "GDP per Capita (constant 2010 US\$)." <https://databank.worldbank.org/source/world-development-indicators> (accessed January 22, 2020).
- World Bank. World Development Indicators. "GNI (Current US\$)." <https://databank.worldbank.org/source/world-development-indicators> (accessed February 13, 2020).
- World Bank. World Development Indicators. "Individuals Using the Internet (% of Population)." <https://databank.worldbank.org/source/world-development-indicators> (accessed November 18, 2019).
- World Bank. World Development Indicators. "Labor Force, Total." <https://data.worldbank.org/indicator/SL.TLF.TOTL.IN> (accessed December 23, 2019).
- World Bank. World Development Indicators. "Logistic Performance Index." [https://lpi.worldbank.org/sites/default/files/International\\_LPI\\_from\\_2007\\_to\\_2018.xlsx](https://lpi.worldbank.org/sites/default/files/International_LPI_from_2007_to_2018.xlsx) (accessed February 14, 2020).
- World Bank. World Development Indicators. "Mobile Cellular Subscriptions (per 100 people)." <https://databank.worldbank.org/source/world-development-indicators> (accessed November 18, 2019).
- World Bank. World Development Indicators. "Oil Rents (% of GDP)." [https://data.worldbank.org/indicator/NY.GDP.PETR.RT.ZS?most\\_recent\\_value\\_desc=true](https://data.worldbank.org/indicator/NY.GDP.PETR.RT.ZS?most_recent_value_desc=true) (accessed October 22, 2019).
- World Bank. World Development Indicators. "Population." <https://databank.worldbank.org/source/world-development-indicators> (accessed November 18, 2019).
- World Bank. World Development Indicators. "Urban Population (% of Total Population)." <https://databank.worldbank.org/source/world-development-indicators> (accessed November 18, 2019).
- World Bank. *World Development Report 2016*. World Bank Group, 2016. <https://www.worldbank.org/en/publication/wdr2016>.

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

World Bank. World Integrated Trade Solution (WITS). <https://wits.worldbank.org/> (accessed September 17, 2019).

World Bank. World Integrated Trade Solution (WITS). “Trade Summary for Sub-Saharan Africa.” <https://wits.worldbank.org/countrysnapshot/en/SSF> (accessed November 20, 2019).

World Bank. World Integrated Trade Solution (WITS). “Trade Summary for Sub-Saharan Africa in 2018.” <https://wits.worldbank.org/CountryProfile/en/Country/SSF/Year/2017/Summary> (accessed January 22, 2020).

World Bureau of Metal Statistics (WBMS). “Zinc.” World Metal Statistics, June 2019. <https://www.world-bureau.com/>.

WorldCover. “What We Do.” [www.worldcovr.com](http://www.worldcovr.com) (accessed October 18, 2019).

World Economic Forum (WEF). *The Africa Competitiveness Report 2015*. Geneva: WEF, 2015. [http://www3.weforum.org/docs/WEF\\_ACR\\_2015/Africa\\_Competitiveness\\_Report\\_2015.pdf](http://www3.weforum.org/docs/WEF_ACR_2015/Africa_Competitiveness_Report_2015.pdf).

World Economic Forum (WEF). *The Africa Competitiveness Report 2017: Addressing Africa’s Demographic Dividend*. Geneva: WEF, 2017. <https://www.weforum.org/reports/africa-competitiveness-report-2017>.

World Economic Forum (WEF). *Grow Africa: Partnering to Achieve African Agriculture Transformation*. Geneva: WEF, January 2016. [http://www3.weforum.org/docs/IP/2016/NVA/GrowAfrica\\_PartneringtoAchieveAfricanAgricultureTransformation\\_Jan2016.pdf](http://www3.weforum.org/docs/IP/2016/NVA/GrowAfrica_PartneringtoAchieveAfricanAgricultureTransformation_Jan2016.pdf).

World Economic Forum. *The Travel and Tourism Competitiveness Report 2017*. Geneva: WEF, April 5, 2017. <https://www.weforum.org/reports/the-travel-tourism-competitiveness-report-2017>.

World Gold Council (WGC). “Gold Demand Trends Full Year 2016.” London: WGC, February 3, 2017. <https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-full-year-2016>.

World Gold Council (WGC). “Gold Demand Trends Full Year 2017.” London: WGC, February 6, 2018. <https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-full-year-2017>.

World Gold Council (WGC). “Gold Demand Trends Full Year and Q4 2018.” London: WGC, January 31, 2019. <https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-full-year-2018>.

World Health Organization (WHO). “Strengthening Pharmaceutical Systems and Improving Access to Quality Medicines: Ethiopia 2012-2016.” 2016. <https://www.who.int/medicines/areas/coordination/Ethiopia-brochure.pdf>.

World Initiative for Soy in Human Health (WISHH). “Origins, Mission and Vision.” <http://www.wishh.org/what-we-do/origins-mission-vision/> (accessed September 17, 2019).

- World Initiative for Soy in Human Health (WISHH). "U.S. Soy Usage Grows in Ghana." November 28, 2018. <http://www.wishh.org/asawishh-africa-regional-consultant-josh-neiderman-traveled-to-ghana-to-meet-with-stakeholders/>.
- World Intellectual Property Organization (WIPO). Advisory Committee on Enforcement (Twelfth Session). "Awareness Building and Strategic Campaigns as a Means for Building Respect for IP." June 29, 2017. [https://www.wipo.int/meetings/en/doc\\_details.jsp?doc\\_id=383423](https://www.wipo.int/meetings/en/doc_details.jsp?doc_id=383423).
- World Intellectual Property Organization (WIPO). "Copyright: What Is Copyright?" <https://www.wipo.int/copyright/en/> (accessed January 21, 2020). World Intellectual Property Organization (WIPO). *IP Facts and Figures 2018*. 2019. <https://www.wipo.int/publications/en/details.jsp?id=4382>.
- World Intellectual Property Organization (WIPO). "Joint Recommendation Concerning Provisions on the Protection of Well-Known Marks." 2000. <https://www.wipo.int/publications/en/details.jsp?id=346>.
- World Intellectual Property Organization (WIPO). "Nigeria Joins Four Key Copyright Treaties." October 4, 2017. [https://www.wipo.int/portal/en/news/2017/article\\_0017.html](https://www.wipo.int/portal/en/news/2017/article_0017.html).
- World Intellectual Property Organization (WIPO). "Patents: What Is a Patent?" <https://www.wipo.int/patents/en/> (accessed January 21, 2020).
- World Intellectual Property Organization (WIPO). "Statistical Country Profiles" [https://www.wipo.int/ipstats/en/statistics/country\\_profile/](https://www.wipo.int/ipstats/en/statistics/country_profile/) (accessed October 18, 2019).
- World Intellectual Property Organization (WIPO). Technical Assistance Database (accessed January 9, 2020). <https://www.wipo.int/tad/en/>.
- World Intellectual Property Organization (WIPO). "Trademarks: What Is a trademark?" <https://www.wipo.int/trademarks/en/> (accessed January 21, 2020).
- World Intellectual Property Organization (WIPO). "Well-known Marks." [https://www.wipo.int/sme/en/ip\\_business/marks/well\\_known\\_marks.htm](https://www.wipo.int/sme/en/ip_business/marks/well_known_marks.htm) (accessed January 21, 2020).
- World Intellectual Property Organization (WIPO). "What Is Intellectual Property?" <https://www.wipo.int/about-ip/en/> (accessed January 21, 2020).
- World Intellectual Property Organization (WIPO). World Intellectual Property Report, 2013. <https://www.wipo.int/publications/en/details.jsp?id=384&plang=EN>.
- World Oil*. "Africa Oil Makes Significant Discovery, Opens South Africa Petroleum Province." February 7, 2019. <https://www.worldoil.com/news/2019/2/7/africa-oil-makes-significant-discovery-opens-south-africa-petroleum-province>.
- World Oil*. "Anadarko Announces FID on Area 1 Mozambique LNG Project." June 19, 2019. <https://www.worldoil.com/news/2019/6/19/anadarko-announces-fid-on-area-1-mozambique-lng-project>.

- World Oil*. “Aquaterra Energy Lands Double Platform Contract for NNPC/FIRST E&P JV in Nigeria.” November 27, 2018. <https://www.worldoil.com/news/2018/11/27/aquaterra-energy-lands-double-platform-contract-for-nnpc-first-ep-jv-in-nigeria>.
- World Oil*. “BHGE Launches Multimodal Facility Expansion in Angola.” June 10, 2019. <https://www.worldoil.com/news/2019/6/10/bhge-launches-multimodal-facility-expansion-in-angola>.
- World Oil*. “BP Awards Contracts to McDermott, BHGE for Greater Tortue Ahmeyim Natural Gas Project.” March 11, 2019. <https://www.worldoil.com/news/2019/3/11/bp-awards-contracts-to-mcdermott-bhge-for-greater-tortue-ahmeyim-natural-gas-project>.
- World Oil*. “BP Awards Contracts to BHGE, McDermott for Greater Tortue Ahmeyim Natural Gas Project.” April 14, 2019. <https://www.worldoil.com/news/2019/4/14/bp-awards-contracts-to-bhge-mcdermott-for-greater-tortue-ahmeyim-natural-gas-project>.
- World Oil*. “Eni Announces Akoma Discovery in CTP-block 4, Offshore Ghana.” May 9, 2019. <https://www.worldoil.com/news/2019/5/9/eni-announces-akoma-discovery-in-ctp-block-4-offshore-ghana>.
- World Oil*. “Eni Reports Major Oil Discovery Offshore Angola.” March 13, 2019. <https://www.worldoil.com/news/2019/3/13/eni-reports-major-oil-discovery-offshore-angola>.
- World Oil*. “ExxonMobil, Partners to Redevelop Angola Block 15 to Increase Production.” June 5, 2019. <https://www.worldoil.com/news/2019/6/5/exxonmobil-partners-to-redevelop-angola-block-15-to-increase-production>.
- World Oil*. “New Discovery Expands Natural Gas Resource Potential Offshore Mauritania, Senegal.” July 1, 2019. <https://www.worldoil.com/news/2019/7/1/new-discovery-expands-natural-gas-resource-potential-offshore-mauritania-senegal>.
- World Oil*. “Rovuma LNG Development Plan Approved by Mozambique Government.” May 14, 2019. <https://www.worldoil.com/news/2019/5/14/rovuma-lng-development-plan-approved-by-mozambique-government>.
- World Platinum Investment Council (WPIC). “Palladium Premium Indicates Platinum Opportunity.” *Platinum Perspectives*, October 2018. [https://www.platinuminvestment.com/files/685777/WPIC\\_Platinum\\_Perspectives\\_Palladium\\_October\\_2018.pdf](https://www.platinuminvestment.com/files/685777/WPIC_Platinum_Perspectives_Palladium_October_2018.pdf).
- World Steel Association. “World Steel in Figures—2018.” 2018. <https://www.worldsteel.org/en/dam/jcr:f9359dff-9546-4d6b-bed0-996201185b12/World+Steel+in+Figures+2018.pdf>.
- World Steel Association. “World Steel in Figures—2019.” June 3, 2019. <https://www.worldsteel.org/media-centre/press-releases/2019/world-steel-in-figures-2019.html>.

- World Steel Dynamics. *SteelBenchmarker*. [http://steelbenchmarker.com/files/price\\_history.xls](http://steelbenchmarker.com/files/price_history.xls) (accessed August 12, 2019).
- World Trademark Review. "Lego Prevails, Jaguar Land Rover Wins Big in China, and IPOs Extend Mediation Scheme: News Digest." March 26, 2019 (accessed January 9 2020). <https://www.worldtrademarkreview.com/lego-prevails-jaguar-land-rover-wins-big-china-and-singapore-ipo-extends-mediation-scheme-news>.
- World Trade Organization (WTO). "Compulsory Licensing of Pharmaceuticals and TRIPS." [https://www.wto.org/english/tratop\\_e/trips\\_e/public\\_health\\_faq\\_e.htm](https://www.wto.org/english/tratop_e/trips_e/public_health_faq_e.htm) (accessed January 21, 2020).
- World Trade Organization (WTO). "MC11 in Brief: Electronic Commerce." December 2017. [https://www.wto.org/english/thewto\\_e/minist\\_e/mc11\\_e/briefing\\_notes\\_e/bfecom\\_e.htm](https://www.wto.org/english/thewto_e/minist_e/mc11_e/briefing_notes_e/bfecom_e.htm).
- World Trade Organization (WTO). Statistics Database, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BPM6)." <http://stat.wto.org/StatisticalProgram/WSDDBStatProgramHome.aspx?Language=E> (accessed multiple dates).
- World Trade Organization (WTO). Tariff Analysis Online. <http://www.tao.wto.org/report/TariffLines.aspx> (accessed March 4, 2020).
- World Trade Organization (WTO). "WTO Members Agree to Extend Drug Patent Exemption for Poorest Members." News Release, November 6, 2015. [https://www.wto.org/english/news\\_e/news15\\_e/trip\\_06nov15\\_e.htm](https://www.wto.org/english/news_e/news15_e/trip_06nov15_e.htm).
- Yergin, Daniel. *The Quest: Energy, Security, and the Remaking of the Modern World*. New York, NY: Penguin, 2011.
- Yohannes, Robel. "Ethiopia: Textile Sector on the Rise." *Ethiopian Herald*, April 5, 2018. Online at AllAfrica.com. <https://allafrica.com/stories/201804050981.html>.
- Yohannes, Robel. "Ethiopia: Trademark Protecting Businesses." *Ethiopian Herald*, February 28, 2018. Online at AllAfrica.com. <https://allafrica.com/stories/201802280755.html>.
- You, Liangzhi, Claudia Ringler, Ulrike Wood-Sichra, Richard Robertson, Stanley Wood, Tingju Zhu, Gerald Nelson, Zhe Guo, and Yan Sun. "What Is the Irrigation Potential for Africa? A Combined Biophysical and Socioeconomic Approach." *Food Policy* 36, no. 6 (December 2011): 770–82. <https://doi.org/10.1016/j.foodpol.2011.09.001>.
- Yuan, Matthew. "A Medical Drone Startup's Approach to Navigating Regulation, Building Trust, and Creating Amazing Teams." Medium, June 10, 2019, <https://medium.com/profiles-in-entrepreneurship/a-medical-drone-startups-approach-to-navigating-regulation-building-trust-and-creating-amazing-38737c02ff9b>.
- Yuan, Wen Jen. "China's Trade and Investment in Financial Services in Africa." U.S. International Trade Commission. Executive Briefing on Trade, October 2014. [https://www.usitc.gov/publications/332/ebot\\_china\\_trade\\_investment\\_finservices-africa.pdf](https://www.usitc.gov/publications/332/ebot_china_trade_investment_finservices-africa.pdf).

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

- Zamfir, Ionel. "The Tripartite Free Trade Area Project: Integration in Southern and Eastern Africa." European Parliamentary Research Service (EPRS) briefing, March 2015. [http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/551308/EPRS\\_BRI\(2015\)551308\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/551308/EPRS_BRI(2015)551308_EN.pdf).
- Zandbergen, Katie. "M-Pesa: A Tale of Global Prosperity." *Forum at HBS* (blog), Harvard Business School, January 14, 2019. <https://www.hbs.edu/forum-for-growth-and-innovation/blog/post/m-pesa-a-tale-of-global-prosperity>.
- Zawadzki, Sabina. "Anadarko Approves \$20 Billion LNG Export Project in Mozambique." Reuters, June 18, 2019. <https://www.reuters.com/article/us-mozambique-anadarko-lng/anadarko-approves-20-billion-lng-export-project-in-mozambique-idUSKCN1TJ2DJ>.
- Zhou, Yujun, Kathy Baylis, Jonathan Coppess, and Qianting Xie. "Evaluating Potential Long-Run Impacts of Chinese Tariff on US Soybeans." *Farmdoc Daily*, University of Illinois at Urbana-Champaign, September 26, 2018. <https://farmdocdaily.illinois.edu/2018/09/evaluating-potential-long-run-impacts-of-chinese-tariff-on-us-soybeans.html>.
- Zijlma, Anouk. "How to Fly Direct from the USA." TripSavvy, May 5, 2019. [2019.https://www.tripsavvy.com/direct-flights-from-usa-to-africa-1454130](https://www.tripsavvy.com/direct-flights-from-usa-to-africa-1454130).
- Zimnisky, Paul. "Diamonds: A Not So Shiny Outlook." *Mining Review Africa*, January 15, 2019. <http://www.paulzimnisky.com/Diamonds%20A%20Not%20So%20Shiny%20Outlook%20-%20Paul%20Zimnisky%20-%20Mining%20Review%20Africa%20-%20January%202019.pdf?attredirects=0>.
- Zimnisky, Paul. "Global Diamond Production by Mine, 2018." Diamond Analytics, March 3, 2018. <http://www.paulzimnisky.com/global-diamond-production-by-mine-2018>.
- Zimnisky, Paul. "Replenishing the Diamond Pipeline." *Northern Miner*, August 20, 2018. <https://www.northernminer.com/news/minerals-commentary-replenishing-the-diamond-pipeline-is-a-daunting-task-for-miners/1003798402/>.
- Zion Market Research. "Global Industry Size and Share of Beer Market to Gain USD 750.00 Billion by 2022." News release. Globe Newswire, August 29, 2019. <https://www.globenewswire.com/news-release/2019/08/29/1908385/0/en/Global-Industry-Size-Share-of-Beer-Market-to-Gain-USD-750-00-Billion-By-2022-Zion-Market-Research.html>.
- Zipline. "About." <https://flyzipline.com/about/#actions> (accessed various dates, July–November 2019).
- Zipline. "Our Impact." <https://www.flyzipline.com/impact/> (accessed various dates, July–November 2019).
- Zipline. "Zipline." <https://www.flyzipline.com/> (accessed various dates, July–November 2019).



# **Appendix A**

## **Request Letter**

DOCKET NUMBER  3387
Office of the Secretary Int'l Trade Commission



THE UNITED STATES TRADE REPRESENTATIVE  
EXECUTIVE OFFICE OF THE PRESIDENT  
WASHINGTON

May 6, 2019



The Honorable David S. Johanson  
Chairman  
U.S. International Trade Commission  
500 E Street, S.W.  
Washington, DC 20436

Dear Chairman Johanson:

I am writing today regarding the Office of the United States Trade Representative's ongoing work on trade and investment issues related to sub-Saharan Africa (SSA).

This Administration seeks factual information on SSA's trade performance under the African Growth and Opportunity Act (AGOA). Specifically, the Administration seeks to gain further understanding of how enforcement of intellectual property rights and other policy measures affect trade and investment across the region, as well as a better understanding of growing markets for biotechnology and digital products and services, particularly for key markets such as South Africa, Nigeria, Kenya, Ghana, Rwanda, Ethiopia, and Cote d'Ivoire.

Therefore, pursuant to section 332(g) of the Tariff Act of 1930, and the authority delegated by the President to the United States Trade Representative, I request that the U.S. International Trade Commission (the Commission) conduct an investigation and provide a report on U.S. trade and investment with SSA. To the extent that information is available, the report should focus primarily on the years 2016-2018, or the latest three years for which data are available, but where appropriate examine longer-term trends since 2000. This report should include the following:

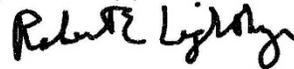
1. An overview of U.S. exports of goods and services to SSA, which should, to the extent information is available:
  - a. Identify the sectors in which U.S. exports of goods and services to SSA have increased the most, in both value and percentage terms, and indicate major factors behind this growth.
  - b. Identify the SSA countries to which U.S. exports of goods and services have increased the most, in both value and percentage terms, and indicate the major factors behind this growth.
  - c. Identify SSA countries to which U.S. outward FDI has increased the most, in both value and percentage terms, and indicate major factors behind this growth.

- d. Provide examples of how products and services from the United States integrate into key SSA value chains; identify possible opportunities for U.S. firms to better integrate into these value chains, where appropriate; and describe national or regional policies and other macroeconomic factors that may affect future demand for these U.S. products.
2. An overview of U.S. imports of goods and services from SSA, which should, to the extent information is available:
  - a. Identify the sectors in which U.S. imports of goods and services from SSA have increased the most, in both value and percentage terms, and indicate major factors behind this growth. Data on goods should include both AGOA (including GSP) imports and total imports.
  - b. Identify the SSA countries in which exports of goods and services to the United States have increased the most, in both value and percentage terms, and indicate the major factors behind this growth. Data on goods should include both AGOA (including GSP) imports and total imports.
3. To the extent information is available, describe the intellectual property environment, including national and regional laws, enforcement measures, and infringement issues, in key SSA markets. Through case studies describe the effects of the intellectual property environment on trade and investment in the key SSA markets.
4. Provide a broad overview and examples of technological innovation in the SSA food and agricultural production, processing, and marketing system. This should include a broad description of SSA food and agricultural producers' use of technological improvements in such areas as crop and livestock nutrition and genetics (including biotechnology); machinery and equipment; data processing and analytics; and digital market information and risk management systems. Through case studies, describe how the adoption of such technological improvements has affected certain SSA food and agricultural producers' overall production and export performance. Additionally, describe current national and regional regulatory policies and market conditions in key countries in SSA that may affect the adoption of technological improvements in the SSA food and agricultural sector.
5. Provide a broad overview and describe recent developments in the digital economy for key SSA markets. Provide information on the market for digital technologies in those key SSA markets as well as the role of digital products and services from the United States. To the extent that data are available, describe the market for digital products and services, such as internet-connected devices, cloud computing, e-commerce, internet of things, blockchain, and internet search and digital content, as well as how adoption of digital technologies affects other industry sectors, such as manufacturing and other services. Describe current national and regional regulatory and policy measures and market conditions in key countries in SSA that affect digital trade.

6. Provide a summary of recent developments of regional integration efforts in SSA, including progress on the negotiation and implementation of the African Continental Free Trade Area.
7. Briefly summarize the AGOA utilization strategies that have been developed by SSA countries.
8. To the extent practicable, provide a summary of the most recent 2019 data on U.S. trade flows of goods with SSA.

I request that the Commission deliver the report by March 31, 2020. As I intend to make the report available to the public, I request that the Commission not include any confidential business information or national security information in the report. Your assistance in this matter is appreciated.

Sincerely yours,



Robert E. Lighthizer

## **Appendix B**

### *Federal Register* **Notice**



that falls under Section 304 of the NHPA.

**Walter D. Cruickshank,**  
*Acting Director, Bureau of Ocean Energy Management.*

[FR Doc. 2019-12962 Filed 6-18-19; 8:45 am]

BILLING CODE 4310-MIR-P

**INTERNATIONAL TRADE COMMISSION**

[Investigation No. 332-571]

**U.S. Trade and Investment With Sub-Saharan Africa: Recent Trends and New Developments**

**AGENCY:** United States International Trade Commission.

**ACTION:** Institution of investigation and scheduling of public hearing.

**SUMMARY:** Following receipt of a request dated May 6, 2019 from the United States Trade Representative (USTR) under the section 332(g) of the Tariff Act of 1930, the U.S. International Trade Commission (Commission) has instituted Investigation No. 332-571, *U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments*, for the purpose of preparing the report requested by the USTR. The Commission has scheduled a public hearing in connection with this investigation for July 24, 2019.

**DATES:**

- July 12, 2019: Deadline for filing requests to appear at the public hearing.
- July 17, 2019: Deadline for filing pre-hearing briefs and statements.
- July 24, 2019: Public hearing.
- July 31, 2019: Deadline for filing post-hearing briefs and statements.
- August 16, 2019: Deadline for filing all other written submissions.
- March 31, 2020: Transmittal of Commission report to USTR.

**ADDRESSES:** All Commission offices, including the Commission's hearing rooms, are located in the United States International Trade Commission Building, 500 E Street SW, Washington, DC. All written submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW, Washington, DC 20436. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at <https://edis.usitc.gov/edis3-internal/app>.

**FOR FURTHER INFORMATION CONTACT:** Project Leaders Arthur Chambers ([arthur.chambers@usitc.gov](mailto:arthur.chambers@usitc.gov) or 202-205-2766) or Wen Jin (Jean) Yuan

([wenjin.yuan@usitc.gov](mailto:wenjin.yuan@usitc.gov) or 202-205-2383) for information specific to this investigation. For information on the legal aspects of this investigation, contact William Gearhart of the Commission's Office of the General Counsel ([william.gearhart@usitc.gov](mailto:william.gearhart@usitc.gov) or 202-205-3091). The media should contact Margaret O'Laughlin, Office of External Relations ([margaret.olaughlin@usitc.gov](mailto:margaret.olaughlin@usitc.gov) or 202-205-1819). Hearing-impaired individuals may obtain information on this matter by contacting the Commission's TDD terminal at 202-205-1810. General information concerning the Commission may also be obtained by accessing its internet server (<https://www.usitc.gov>). Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000.

**Background:** The Commission instituted this investigation following receipt of a letter from the USTR dated May 6, 2019. The letter requested that the Commission conduct an investigation and provide a report on U.S. trade and investment with sub-Saharan Africa (SSA). The USTR asked that the Commission's report, to the extent information is available, focus primarily on the years 2016-2018, or the latest three years for which data are available, but where appropriate examine longer-term trends since 2000. The USTR asked that this report should include the following:

1. An overview of U.S. exports of goods and services to SSA, which should, to the extent information is available:
  - a. Identify the sectors in which U.S. exports of goods and services to SSA have increased the most, in both value and percentage terms, and indicate major factors behind this growth.
  - b. Identify the SSA countries to which U.S. exports of goods and services have increased the most, in both value and percentage terms, and indicate the major factors behind this growth.
  - c. Identify SSA countries to which U.S. outward FDI has increased the most, in both value and percentage terms, and indicate major factors behind this growth.
  - d. Provide examples of how products and services from the United States integrate into key SSA value chains; identify possible opportunities for U.S. firms to better integrate into these value chains, where appropriate; and describe national or regional policies and other macroeconomic factors that may affect future demand for these U.S. products.
2. An overview of U.S. imports of goods and services from SSA, which

should, to the extent information is available:

a. Identify the sectors in which U.S. imports of goods and services from SSA have increased the most, in both value and percentage terms, and indicate major factors behind this growth. Data on goods should include both AGOA (including GSP) imports and total imports.

b. Identify the SSA countries in which exports of goods and services to the United States have increased the most, in both value and percentage terms, and indicate the major factors behind this growth. Data on goods should include both AGOA (including GSP) imports and total imports.

3. To the extent information is available, describe the intellectual property environment, including national and regional laws, enforcement measures, and infringement issues, in key SSA markets. Through case studies describe the effects of the intellectual property environment on trade and investment in the key SSA markets.

4. Provide a broad overview and examples of technological innovation in the SSA food and agricultural production, processing, and marketing system. This should include a broad description of SSA food and agricultural producers' use of technological improvements in such areas as crop and livestock nutrition and genetics (including biotechnology); machinery and equipment; data processing and analytics; and digital market information and risk management systems. Through case studies, describe how the adoption of such technological improvements has affected certain SSA food and agricultural producers' overall production and export performance. Additionally, describe current national and regional regulatory policies and market conditions in key countries in SSA that may affect the adoption of technological improvements in the SSA food and agricultural sector.

5. Provide a broad overview and describe recent developments in the digital economy for key SSA markets. Provide information on the market for digital technologies in those key SSA markets as well as the role of digital products and services from the United States. To the extent that data are available, describe the market for digital products and services, such as internet-connected devices, cloud computing, e-commerce, Internet of Things, blockchain, and internet search and digital content, as well as how adoption of digital technologies affects other industry sectors, such as manufacturing and other services. Describe current national and regional regulatory and

policy measures and market conditions in key countries in SSA that affect digital trade.

6. Provide a summary of recent developments of regional integration efforts in SSA, including progress on the negotiation and implementation of the African Continental Free Trade Area.

7. Briefly summarize the AGOA utilization strategies that have been developed by SSA countries.

8. To the extent practicable, provide a summary of the most recent 2019 data on U.S. trade flows of goods with SSA.

9. The USTR asked the Commission provide its report by March 31, 2020.

**Public Hearing:** A public hearing in connection with this investigation will be held at the U.S. International Trade Commission Building, 500 E Street SW, Washington, DC, beginning at 9:30 a.m. on July 24, 2019. Requests to appear at the hearing should be filed with the Secretary no later than 5:15 p.m., July 12, 2019, in accordance with the requirements in the “written submissions” section below. All pre-hearing briefs and statements should be filed not later than 5:15 p.m., July 17, 2019; and all post-hearing briefs and statements addressing matters raised at the hearing should be filed not later than 5:15 p.m., July 31, 2019. In the event that, as of the close of business on July 12, 2019, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or nonparticipant may call the Secretary to the Commission (202–205–2000) after July 12, 2019, for information concerning whether the hearing will be held.

**Written Submissions:** In lieu of or in addition to participating in the hearing, interested parties are invited to file written submissions concerning this investigation. All written submissions should be addressed to the Secretary, and should be received not later than 5:15 p.m., August 16, 2019. All written submissions must conform to the provisions of section 201.8 of the Commission’s Rules of Practice and Procedure (19 CFR 201.8). Section 201.8 and the Commission’s Handbook on Filing Procedures require that interested parties file documents electronically on or before the filing deadline and submit eight (8) true paper copies by noon eastern time on the next business day. In the event that confidential treatment of a document is requested, interested parties must file, at the same time as the eight paper copies, at least four (4) additional true paper copies in which the confidential business information must be deleted (see the following

paragraphs for further information regarding confidential business information). Persons with questions regarding electronic filing should contact the Office of the Secretary, Docket Services Division (202–205–1802).

**Confidential Business Information.** Any submissions that contain confidential business information must also conform to the requirements of section 201.6 of the Commission’s Rules of Practice and Procedure (19 CFR 201.6). Section 201.6 of the rules requires that the cover of the document and the individual pages be clearly marked as to whether they are the “confidential” or “non-confidential” version, and that the confidential business information is clearly identified by means of brackets. All written submissions, except for confidential business information, will be made available for inspection by interested parties.

In his request letter, the USTR stated that his office intends to make the Commission’s report available to the public and asked that the Commission not include any confidential business information or national security information in the report. The Commission will not include any confidential business information in the report that it sends to the USTR or makes available to the public. However, all information, including confidential business information, submitted in this investigation may be disclosed to and used: (i) By the Commission, its employees and Offices, and contract personnel (a) for developing or maintaining the records of this or a related proceeding, or (b) in internal investigations, audits, reviews, and evaluations relating to the programs, personnel, and operations of the Commission including under 5 U.S.C. Appendix 3; or (ii) by U.S. government employees and contract personnel for cybersecurity purposes. The Commission will not otherwise disclose any confidential business information in a manner that would reveal the operations of the firm supplying the information.

**Summaries of Written Submissions:** The Commission intends to publish summaries of the positions of interested persons. Persons wishing to have a summary of their position included in the report should include a summary with their written submission and should specifically state the summary is intended for that purpose, and it should be titled as such. The summary may not exceed 500 words, should be in MSWord format or a format that can be easily converted to MSWord, and

should not include any confidential business information. The summary will be included in the report as provided if it meets these requirements and is germane to the subject matter of the investigation. The Commission will identify the name of the organization furnishing the summary and will include a link to the Commission’s Electronic Document Information System (EDIS) where the full written submission can be found.

By order of the Commission.

Issued: June 14, 2019.

**Lisa Barton,**

*Secretary to the Commission.*

[FR Doc. 2019–13029 Filed 6–18–19; 8:45 am]

BILLING CODE 7020–02–P

## INTERNATIONAL TRADE COMMISSION

[Investigation Nos. 701–TA–447 and 731–TA–1116 (Second Review)]

### Circular Welded Carbon-Quality Steel Pipe From China

#### Determinations

On the basis of the record<sup>1</sup> developed in the subject five-year reviews, the United States International Trade Commission (“Commission”) determines, pursuant to the Tariff Act of 1930 (“the Act”), that revocation of the countervailing and antidumping duty orders on circular welded carbon-quality steel pipe from China would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.<sup>2</sup>

#### Background

The Commission, pursuant to section 751(c) of the Act (19 U.S.C. 1675(c)), instituted these reviews on November 1, 2018 (83 FR 54936) and determined on March 11, 2019 that it would conduct expedited reviews (84 FR 17889, April 26, 2019).

The Commission made these determinations pursuant to section 751(c) of the Act (19 U.S.C. 1675(c)). It completed and filed its determinations in these reviews on June 14, 2019. The views of the Commission are contained in USITC Publication 4901 (June 2019), entitled *Circular Welded Carbon-Quality Steel Pipe from China: Investigation Nos. 701–TA–447 and 731–TA–1116 (Second Review)*.

By order of the Commission.

<sup>1</sup> The record is defined in sec. 207.2(f) of the Commission’s Rules of Practice and Procedure (19 CFR 207.2(f)).

<sup>2</sup> Commissioner Meredith M. Broadbent not participating.



## **Appendix C**

# **Calendar of Hearing Witnesses**

CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

**Subject:** U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments  
**Inv. No.:** 332-571  
**Date and Time:** July 24, 2019 - 9:30 a.m.

Sessions were held in connection with this investigation in the Main Hearing Room (Room 101), 500 E Street, S.W., Washington, DC.

**EMBASSY APPEARANCES:**

**Embassy of the Republic of Rwanda**  
Washington, DC

**Her Excellency Mathilde Mukantabana, Ambassador of the Republic of Rwanda to the United States of America**

**Embassy of the Federal Democratic Republic of Ethiopia**  
Washington, DC

**His Excellency Fitsum Arega, Ambassador of the Federal Democratic Republic of Ethiopia to the United States of America**

**Embassy of the Republic of South Africa**  
Washington, DC

**The Honorable Yoliswa Mvebe, Chargé d' Affaires Ad Interim of South Africa to the United States of America**

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

### PANEL 1:

#### ORGANIZATION AND WITNESS:

#### TIME ALLOCATION:

Atlantic Council  
Washington, DC 10 minutes

**Aubrey Hruby**, Senior Fellow, Africa Center

New Markets Lab (“NML”)  
Washington, DC 10 minutes

**Katrin Kuhlmann**, President and Founder

Microsoft Corporation  
Washington, DC 10 minutes

**Mike Yeh**, Assistant General Counsel, Middle East and Africa

### PANEL 2:

#### ORGANIZATION AND WITNESS:

#### TIME ALLOCATION:

International Intellectual Property Alliance  
Washington, DC 10 minutes

**Kevin M. Rosenbaum**, Counsel

Intellectual Property Consultant and Attorney  
Washington, DC 10 minutes

**Getachew Mengisite Alemu**, Intellectual Property Law Expert

The App Association  
Washington, DC 10 minutes

**Brian Scarpelli**, Senior Global Policy Counsel

Public Citizen  
Washington, DC 10 minutes

**Zain Rizvi**, Law and Policy Researcher, Access to Medicines Program

**Joelle Dountio Ofimboudem**, Law Fellow, Access to Medicines Program

American Property Casualty Insurance Association (“APCIA”)  
Washington, DC 10 minutes

**Stephen Simchak**, Vice President and Chief International Counsel

Manchester Trade Limited, Inc.  
Washington, DC 10 minutes

**Stephen Lande**, President

Appendix C  
Calendar of Hearing Witnesses

**PANEL 2 (continued):**

Johns Hopkins University/ SAIS  
Baltimore, MD 10 minutes

**Anthony Carroll**, Adjunct Professor

**PANEL 3:**

**ORGANIZATION AND WITNESS:**

**TIME ALLOCATION:**

American Apparel & Footwear Association  
Washington, DC 10 minutes

**Steve Lamar**, Executive Vice President

Caleres  
Saint Louis, MO 10 minutes

**Dan Friedman**, President, Sourcing and Supply Chain

Brookfield Associates, LLC  
Washington, DC 10 minutes

**Gail W. Strickler**, President, Global Trade

Corporate Council on Africa  
Washington, DC 10 minutes

**Laird Treiber**, Senior Adviser to the President

The Stevenson Group LLC  
Washington, DC 10 minutes

**Ambassador C. Steven McGann**, Founder

Brookings Institution  
Washington, DC 10 minutes

**Landry Signé**, David M. Rubenstein Fellow, Africa Growth Initiative

The Jewelers Vigilance Committee (“JVC”)  
New York, NY 10 minutes

**Tiffany Stevens**, President, Chief Executive Officer

- END -

## **Appendix D**

# **Summary of the Views of Interested Parties**

## Views of Interested Parties

Interested parties had the opportunity to file written submissions to the Commission in the course of this investigation and to provide summaries of the positions expressed in the submissions for inclusion in this report. This appendix contains these written summaries, provided that they meet certain requirements set out in the notice of investigation. The Commission has not edited these summaries. This appendix also contains the names of interested parties who filed full written submissions during investigation (table D.1). A copy of each written submission is available in the Commission's Electronic Docket Information System (EDIS).<sup>1657</sup> The Commission also held a public hearing in connection with this investigation on July 24, 2019. The full text of the transcript of the Commission's hearing is also available on EDIS.

## Written Summaries

### The US Processed Pear Industry<sup>1658</sup>

As requested in the June 19 Federal Register notice, the US industry hereby provides a summary of its submission for inclusion in the "Summary of Positions of Interested Parties" segment of the ITC's Section 332 Report.

The US processed pear industry urges the ITC to incorporate into the body of its Section 332 Report the following conditions of competition and US industry concerns respecting South Africa's processed pear sector:

- South African processed pears are highly competitive and substitutable with US production, and have long undercut US prices and displaced US sales in the US market.
- With the benefit of zero-duty AGOA treatment and unfair pricing, South Africa's processed pear industry has increased its US market presence and disrupted US industry sales in the years since AGOA began.
- The US industry continues to suffer serious contraction and other injury as a result of unfairly priced US imports, including from South Africa.
- South African processed pears should not be receiving AGOA duty-free treatment for the following reasons, among others:

-- highly competitive, low-priced South African processed pears continue to displace US sales in the US market;

-- all other major South African canned fruit sectors -- i.e., canned peaches (HTS 2008.70.20) and fruit mixtures (HTS 2008.97.90) -- have been denied zero-duty AGOA treatment since AGOA began; and

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<sup>1657</sup> Available online at <http://edis.usitc.gov>.

<sup>1658</sup> The comments are filed by the Northwest Horticultural Council, Pacific Northwest Canned Pear Service, Washington-Oregon Canning Pear Association, California Pear Advisory Board, and California Pear Growers Association, collectively the "US processed pear industry" or "US industry".

-- US canned pears, like canned peaches and fruit mixtures, have been designated import sensitive under the 2002 and 2015 US Trade Promotion Authority (“TPA”) laws, yet have wrongly been denied that import-sensitive treatment under AGOA.

The US industry further asks the ITC to recommend in its Section 332 Report that should the United States launch US trade negotiations with South Africa or any other SSA country, the following treatment be accorded to canned pears:

- The 15.3% US MFN tariff on processed pears (HTS 2008.40.00) should be deemed import-sensitive, as required under TPA, and applied at that rate upon entry into force of any agreement. If tariff-elimination exemptions are allowed under that agreement, the US processed pear tariff should be subject to such exemptions. If exemptions are not allowed, the US processed pear tariff should be subject to maximum possible phase-out periods over the term of the agreement.
- Strict rules of origin (“ROOs”) should be established for processed pears under any agreement reached with one or more SSA countries other than South Africa. The ROOs should be comparable to the processed pear ROO provisions under the United States-Korea Free Trade Agreement and other similar prior free trade agreements, including the requirement that 100% of the fresh and frozen pears used in processed pears be grown in the territory of the parties, with no de minimis exception.

## The US Processed Peach Industry<sup>1659</sup>

As requested in the June 19 Federal Register notice, the US industry hereby provides a summary of this submission for inclusion in the “Summary of Positions of Interested Parties” segment of the ITC’s Section 332 Report.

The US processed peach industry urges the ITC to incorporate into the body of its Section 332 Report the following conditions of competition and recommendations respecting South Africa’s processed peach sector:

- South African processed peaches are highly competitive and substitutable with US production, and have long undercut US prices and displaced US sales in the US market.
- The US industry continues to suffer serious contraction and other injury as a result of unfairly priced US imports, including from South Africa.
- In 2019 year-to-date, South Africa is the third largest supplier of processed peaches to the US market and is selling canned peaches at prices well below the California industry’s price, even without AGOA preferences.
- Should the United States launch US trade negotiations with South Africa or any other SSA country, the following treatment should be accorded to processed peaches:
  - -- The 17% US MFN tariff on processed peaches (HTS 2008.70.20), 14.9% tariff on fruit mixtures (HTS 2008.97.90), and 14.5% tariff on frozen peaches (HTS 0811.90.80) should be deemed import-sensitive, as required under TPA, and applied at the MFN rate upon entry into force of any trade agreement. If tariff-elimination exemptions are allowed under any such agreement, the US

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<sup>1659</sup> The comments are filed by the California Cling Peach Board and the California Canning Peach Association, collectively the “US processed peach industry” or “US industry”.

processed peach tariffs should be covered by those exemptions. If exemptions are not allowed, the US processed peach tariffs should be subject to maximum possible phase-out periods over the term of the agreement.

- -- Strict rules of origin (“ROOs”) should be established for processed peaches under any agreement reached with one or more SSA countries. The ROOs should be comparable to the processed peach ROO provisions under the United States-Korea Free Trade Agreement and other similar prior free trade agreements, including the requirement that 100% of the fresh and frozen peaches used in processed peaches be grown in the territory of the parties, with no de minimis exception.

## The Express Association of America

- The comments from the Express Association of America – which represents DHL, FedEx, and UPS, the three largest express delivery service providers in the world – focus on express industry concerns about three major policy areas in Sub-Saharan Africa (SSA): postal, trade facilitation, and ecommerce. In addition to supporting U.S. business expansion to SSA markets, these policy considerations are also key elements to promoting intra-regional trade and the economic success of SSA companies.
- The emergence of regressive postal laws, regulations, and policies across SSA can negatively impact investment and growth. Continued prohibitive and overreaching restrictions on the express industry, especially, ultimately reduce SSA’s connectivity to world markets, increase the cost of doing business in the region, lower competitiveness, and limit foreign direct investment. Across SSA, new postal laws, regulations, and policies are being introduced, including: increased licensing fees that are disproportionate to administrative costs; market access restrictions (such as limiting weight, size, or value of goods the industry can transport); restrictions on terms and conditions of carriage by express delivery operators; taxes as a percentage of corporate revenue; and higher transportation liability limits. Express carriers and postal operators, historically and currently, provide two separate and distinct services that cater to different groups of clients. Therefore, it is important that express carriers are carved out from the ambit of postal regulators: unlike the posts, the express delivery industry caters to consumers that want fast delivery, track and trace features, on-demand and flexible pick-up options, and other unique offerings.
- Of equally critical importance to the growth of SSA markets is the progress by governments in trade facilitation and customs modernization reforms. The express delivery industry encourages the implementation of pre-arrival processing, separation of release from payment of duties, efficient risk management, single window platforms, and a commercially meaningful de minimis threshold as a foundation for modern borders. As SSA seeks to lower the cost of logistics and increase intra-Africa trade (especially with the African Continental Free Trade Area), trade facilitation reforms are a key ingredient that should accompany physical logistics improvements such as transportation infrastructure development.
- Lastly, the growth of e-commerce globally presents myriad opportunities for SSA industries to grow to new markets and for U.S. businesses – especially MSMEs – to access consumers in SSA. The express delivery industry’s networks are part of the digitally enabled transaction; both freedom from postal-related restrictions as well as trade facilitation are important to ensuring carriers can meet customer demands. Other policies that should not be ignored center around market access for the express delivery industry (ensuring National Treatment with domestic providers) as well as

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

digital regulations that don't impose overly burdensome requirements on e-commerce enablers. In SSA, least-developed and landlocked countries stand to benefit the most from the internet's ability to connect their markets to the global trade arena – making e-commerce among the top recommendations for the Administration's consideration when undertaking bilateral talks with SSA governments.

**Table D.1** Information provided by interested parties

Organization	Hearing testimony	Written submission
American Apparel & Footwear Association	•	
American Property Casualty Insurance Association	•	
American Sugar Alliance		•
Anthony Carroll (adjunct professor, Johns Hopkins University)	•	
Atlantic Council	•	•
BIO Ventures for Global Health		•
Brookfield Associates, LLC	•	
Brookings Institution	•	
Caleres	•	•
California Canning Peach Association		•
California Cling Peach Board		•
California Pear Advisory Board		•
California Pear Growers Association		•
Consortium for Common Food Names		•
Corporate Council on Africa	•	•
Embassy of Federal Democratic Republic of Ethiopia	•	
Embassy of Kingdom of Lesotho	•	
Embassy of Madagascar		•
Embassy of Mauritius		•
Embassy of the Republic of South Africa	•	•
Embassy of the Republic of Cameroon		•
Embassy of the Republic of Rwanda	•	
Express Association of America		•
Getachew Alemu (intellectual property consultant and attorney)	•	•
Global Intellectual Property Strategy Center		•
Information Technology and Innovation Foundation		•
International Intellectual Property Alliance	•	•
Manchester Trade Limited, Inc.	•	
Microsoft Corporation	•	•
New Markets Lab	•	•
Northwest Horticultural Council		•
Pacific Northwest Canned Pear Service		•
Public Citizen	•	•
The App Association	•	•
The Jewelers Vigilance Committee	•	
The Stevenson Group LLC	•	•
U.S. Africa Business Center (U.S. Chamber of Commerce)		•
U.S. Grains Council		•
Washington-Oregon Canning Pear Association		•

Source: USITC EDIS



# Appendix E

## Data Tables

**Table E.1** Trademark applications and grants by domestic and foreign filers in Ethiopia and Kenya (by number of applications)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total from 2014–18	Total from 2004–18	% of Total from 2014–18
<b>Ethiopia</b>																		
Trademark applications filed	8	3	63	129	446	455	450	560	781	2,163	3,173	2,192	1,788	1,912	2,239	11,304	16,362	69.1
Domestic	7	2	22	55	329	270	149	154	294	614	591	1,001	611	994	1,266	4,463	6,359	70.2
Foreign	1	1	41	74	117	185	301	406	487	1,549	22,582	1,191	1,177	918	973	26,841	30,003	89.5
Trademark applications granted	-	-	-	-	67	48	118	80	144	508	421	423	2,021	1,927	1,962	6,754	7,719	87.5
Domestic	-	-	-	-	1	1	2	78	1	1	1	3	393	837	668	1,902	1,986	95.8
Foreign	-	-	-	-	66	47	116	2	143	507	420	420	1,628	1,090	1,294	4,852	5,733	84.6
0																	0	
<b>Kenya</b>																		
Trademark applications filed	1,396	1,713	1,919	2,180	2,125	2,453	2,926	3,532	3,582	3,969	4,584	4,693	4,843	5,054	4,866	24,040	49,835	48.2
Domestic	778	1,017	1,228	1,428	1,372	1,675	2,031	2,501	2,329	2,787	3,224	3,432	3,573	3,675	3,654	17,558	34,704	50.6
Foreign	618	696	691	752	753	778	895	1,031	1,253	1,182	1,360	1,261	1,270	1,349	1,212	6,452	15,101	42.7
Trademark applications granted	1,972	5,362	2,715	1,902	2,112	1,999	2,352	2,588	2,955	3,058	3,159	3,492	3,828	3,927	3,631	18,037	45,052	40.0
Domestic	719	1,967	1,305	1,073	1,211	1,159	1,360	1,586	1,924	1,883	2,123	2,350	2,781	2,783	2,624	12,661	26,848	47.2
Foreign	1,253	3,665	1,410	829	901	840	992	1,002	1,031	1,175	1,036	1,142	1,047	1,144	1,007	5,376	18,474	29.1

Source: Ethiopia Intellectual Property Office and Kenya Industrial Property Institute. Data updated through September 2019 (received October 1, 2019).

**Table E.2** U.S. imports for consumption under AGOA, by leading growth digests, in percentage change terms 2016–18

Product	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
		Thousand \$			%
Canned fish	658	6,123	35,354	34,695	632.8
Certain builders' hardware	4	55	160	156	573.1
Farm and garden machinery and equipment	8	78	139	131	327.9
Carpets and rugs	12	6	201	190	314.5
Radio and television broadcasting equipment	47	315	668	621	276.1
Industrial fasteners of base metals	26	164	212	187	187.3
All other products (AGOA)	10,442,780	13,642,964	12,063,316	1,620,536	7.5
Total	10,443,534	13,649,705	12,100,050	1,656,516	7.6

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of 8-digit subheadings in the Harmonized Tariff Schedule of the United States (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” Shifts in U.S. Merchandise Trade 2015, September 2016. [https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/tradeshifts/2015/d3/digest\\_hts8\\_dir\\_final.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/tradeshifts/2015/d3/digest_hts8_dir_final.pdf).

**Table E.3** Selected recent trademark enforcement reforms in Ethiopia: administrative, legal, and policy reforms

Initiative	Motivation	Effect (anticipated or realized)
<b>Administrative</b>		
Administrative reorganization of EIPO	Improve trademark enforcement	This mid-2007 reorganization, which was supported by the Prime Minister, was done to align EIPO's mission with that of the anticorruption and tax collection initiatives of the Attorney General's office, and give EIPO greater enforcement capabilities. <sup>a</sup>
Online trademark filing system	Modernize and expedite trademark filing, review, and registration process	On Dec 21, 2018, EIPO launched a new system to end its dependence on paper systems, circumvent outdated administrative procedures, and expedite the trademark application system and review period. <sup>b</sup>
Plans for a specialized IP court	Ensure that adjudicated cases are handled by experts	In 2017, plans were developed to launch a new tribunal system specializing in trademarks, copyrights, and patent cases. Currently, IP cases are handled by special EIPO committees and appeals sent to Federal High Court. <sup>c</sup> Legal experts have criticized it for a lack of knowledge and misapplication of IP law. <sup>d</sup>
More trademark examiners	Expedite trademark registration	EIPO recently increased the number of trademark examiners from 5 to 12. <sup>e</sup>
Deeper technical training	Enhance trademark expertise	EIPO recently differentiated its hiring process to now include “formality examiners” focused on administration and “substantive examiners” to focus on analysis and review. Also increased university training requirements for examiners. <sup>f</sup>
Special IP police unit	Enhance seizure efforts	Rumored to be in preparation. <sup>g</sup>
<b>Legal and Policy Reforms</b>		
Technology policies	Build a knowledge-based Ethiopian economy	National IP Strategy and Technology Transfer Initiative is being initiated by the prime minister that will ultimately require a better system of IP protection.

Initiative	Motivation	Effect (anticipated or realized)
Legal status of franchising	Combat abuse of trademarks in services sectors	In July 2016, a new commercial registration and business license law allowed firm franchising. Aimed at lessening services trademark abuse. <sup>h</sup>
Geographic indicators (GIs)	Expand trademark protection to include GIs	Likely to benefit domestic firms, as it would provide further options on ways to protect trademarks. Also considered necessary for WTO accession.
“IP 4 Development”	Educate rural communities about the value of IP protection	EIPO’s Trademark Directorate has launched an initiative to spread broader trademark awareness among farmers in rural communities by encouraging them to use identical collective marks on a number of their products. <sup>i</sup>
Economic liberalization for WTO accession	Obtain WTO membership, often associated with increased FDI	Ethiopia has been in WTO accession negotiations since 2003. It has not been until recently that the necessary substantive liberalization measures have been taken by the government. New WTO membership has been associated with increases in FDI. <sup>j</sup>

Sources: Compiled by USITC based on interviews with government officials, industry representatives, and local IPR experts by USITC staff, Addis Ababa, Ethiopia, September 30 – October 2, 2019. Other sources included Adams and Adams, the Ethiopian Intellectual Property Office, the European Patent Office, the World Bank, the World Intellectual Property Organization, and the World Health Organization.

<sup>a</sup> Ethiopia’s institutional framework for IP has undergone several reorganizations. In 2009, EIPO was brought under the Attorney General’s office and the Ministry of Science and Technology to align EIPO’s goals with Ethiopia’s National Development Agenda. EIPO, “The Ethiopian IP System,” October 2019; Hoffman and Boudry, “Protecting Traditional Practices of Country of Origin in Developing Countries Through Fair Trade and IPRs,” 2014; WIPO, “Ethiopia’s IP System-An Introduction” (accessed September 20, 2019).

<sup>b</sup> EIPO, “Office Launches Online Trademark Filing System,” December 21, 2018.

<sup>c</sup> Ezega News, “Ethiopian IP Office to Establish Courts to Handle Disputes,” April 19, 2017.

<sup>d</sup> Adams & Adams, “Trade Marks in Ethiopia-What You Need to Know” (accessed September 20, 2019)

<sup>e</sup> EIPO, “The Ethiopian IP System,” Presentation for U.S. International Trade Commission, October 2019.

<sup>f</sup> EIPO, “The Ethiopian IP System,” Presentation for U.S. International Trade Commission, October 2019.

<sup>g</sup> Based on interviews with government officials by USITC staff, Addis Ababa, Ethiopia, October 4–7, 2019.

<sup>h</sup> Several U.S. companies, including Hilton, Marriott, PepsiCo, Pizza Hut, Ramada, Radisson Blue, and Sheraton, now have franchise operations in Ethiopia. World Bank, “Ethiopia Economic Update: The Inescapable Manufacturing Services Nexus: Exploring the Potential of Distribution Services Ethiopia Economic Update,” 2017, 41.

<sup>i</sup> WIPO, Advisory Committee on Enforcement (Twelfth Session), “Awareness Building and Strategic Campaigns as a Means for Building Respect for IP,” June 29, 2017.

<sup>j</sup> Based on interviews with industry representatives by USITC staff, Addis Ababa, Ethiopia, October 1, 2019.

**Table E.4** Selected recent trademark enforcement reforms in Ethiopia: domestic outreach efforts and international coordination

Initiative	Motivation	Effect (anticipated or realized)
<b>Domestic outreach efforts</b>		
Providing more technical workshops	Improve technical expertise in law enforcement and judicial systems	EIPO and the Ethiopian Ministry of Innovation and Technology (MinT) established workshops to train government regulators, customs officials, police, and judges twice a year. Police have become more proactive, are starting to call EIPO to ask for firms’ trademark status. <sup>a</sup>
Government-university partnerships	Educate stakeholders on how to protect trademarks	Initiatives are in preparation; they are coordinated by EIPO and MinT.
<b>International coordination</b>		
Partnership with European Patent Office	Enhance technical capacity	As of July 2019, the European Patent Office and EIPO formed a joint partnership to upgrade the national intellectual property system to attract FDI. <sup>b</sup>

## U.S. Trade and Investment with Sub-Saharan Africa: Recent Trends and New Developments

Initiative	Motivation	Effect (anticipated or realized)
U.S. Embassy and U.S. Patent and Trademark Office	Improve its capabilities	Offer workshops providing MinT with digital processing reform, as well as help expanding public internet capabilities and other technical projects.
World Health Organization (WHO)	Curb fake pharmaceutical sales	Helps Ethiopia gain access to legitimate medicines. <sup>c</sup>
Joint effort with WIPO	Modernize registration process and access WIPO database	This was accomplished through cooperation with WIPO. Also improves access to specialized WIPO databases. <sup>d</sup>
WTO accession	Accede to membership	Working since 2003 to improve IP protection and enforcement to qualify for membership. Accession anticipated in coming years.

<sup>a</sup> Based on interviews with industry representatives, and local IPR experts by USITC staff, Addis Ababa, Ethiopia, October 4–7 2019.

<sup>b</sup> European Patent Office, “EPO Launches Reinforced Partnership with Ethiopia,” July 1, 2019.

<sup>c</sup> World Health Organization, “Strengthening Pharmaceutical Systems and Improving Access to Quality Medicines: Ethiopia,” 2016.

<sup>d</sup> Banya, “Use of Technical & Scientific Information for Technological Capacity Building: Establishment of Technology Innovation Support Centers (TISC) in Africa,” WIPO Presentation at the African Regional Intellectual Property Organization, March 25, 2014.

**Table E.5** Nominal gross domestic product (GDP) and real GDP growth rate, SSA countries, 2016–18

	GDP (million \$) <sup>a</sup>			GDP Growth Rate (%)		
	2016	2017	2018	2016	2017	2018
Angola	101,124	122,124	105,751	-2.6	-0.1	-2.1
Benin	8,579	9,270	10,354	4.0	5.8	6.9
Botswana	15,646	17,406	18,616	4.3	2.9	4.5
Burkina Faso	10,867	12,330	14,125	5.9	6.3	6.8
Burundi	2,960	3,172	3,037	-0.6	0.5	1.6
Cabo Verde	1,663	1,770	1,977	4.7	3.7	5.1
Cameroon	32,622	34,923	38,675	4.6	3.5	4.1
Central African Republic	1,824	2,067	2,220	4.8	4.5	3.8
Chad	10,091	9,976	11,273	-6.3	-3.0	2.6
Comoros	1,012	1,075	1,178	3.3	3.8	3.4
Congo, Democratic Republic of	37,135	38,019	47,228	2.4	3.7	5.8
Congo, Republic of	9,036	8,701	11,264	-2.8	-3.1	1.0
Côte d'Ivoire	35,297	38,054	43,007	8.0	7.7	7.4
Djibouti	2,619	2,767	2,956	6.9	5.1	5.5
Equatorial Guinea	11,233	12,290	13,432	-8.8	-4.7	-6.1
Eritrea	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Eswatini	3,841	4,446	4,711	1.3	2.0	2.4
Ethiopia	74,297	81,760	84,356	9.4	9.5	6.8
Gabon	14,014	14,893	16,854	2.1	0.5	0.8
Gambia	1,467	1,505	1,633	1.9	4.8	6.5
Ghana	55,010	58,997	65,556	3.4	8.1	6.3
Guinea	8,604	10,325	10,907	10.8	10.3	6.2
Guinea-Bissau	1,178	1,347	1,458	6.3	5.9	3.8
Kenya	69,189	78,757	87,908	5.9	4.9	6.3
Lesotho	2,314	2,565	2,739	3.2	-2.3	1.1
Liberia	3,278	3,285	3,264	-1.6	2.5	1.2

	GDP (million \$) <sup>a</sup>			GDP Growth Rate (%)		
	2017	2018	2019	2017	2018	2019
Madagascar	11,849	13,176	13,853	4.0	3.9	4.6
Malawi	5,433	6,303	7,065	2.5	4.0	3.5
Mali	14,011	15,338	17,163	5.8	5.4	4.9
Mauritania	4,679	4,906	5,235	1.8	3.1	3.6
Mauritius	12,232	13,259	14,220	3.8	3.8	3.8
Mozambique	11,937	13,219	14,717	3.8	3.7	3.4
Namibia	11,286	13,566	14,522	1.1	-0.9	-0.5
Niger	7,528	8,120	9,291	4.9	4.9	6.5
Nigeria	404,650	375,745	397,270	-1.6	0.8	1.9
Rwanda	8,476	9,140	9,509	6.0	6.1	8.6
São Tomé and Príncipe	348	375	422	4.2	3.9	2.7
Senegal	19,027	21,082	24,130	6.4	7.1	6.8
Seychelles	1,428	1,503	1,590	4.5	4.3	3.6
Sierra Leone	3,675	3,740	4,085	6.1	4.2	3.4
Somalia	4,198	4,509	4,721	n.a.	n.a.	n.a.
South Africa	296,357	349,554	368,289	0.4	1.4	0.8
South Sudan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sudan	95,558	123,053	40,852	4.7	4.3	-2.3
Tanzania	49,774	53,321	58,001	6.9	6.8	5.4
Togo	4,484	4,808	5,359	5.6	4.4	4.9
Uganda	24,134	25,995	27,461	4.8	3.9	6.2
Zambia	20,955	25,868	26,720	3.8	3.4	3.8
Zimbabwe	20,549	22,813	31,001	0.8	4.7	6.2

Source: World Bank, World Development Indicators, "GDP (current US\$)" (accessed February 5, 2020); World Bank, World Development Indicators, "GDP Growth (annual %)" (accessed February 5, 2020).

Note: n.a. = not available.

<sup>a</sup> GDP (current USD)

**Table E.6** Gross national income (GNI) per capita and income level classification, SSA countries, 2016–18

SSA country	GNI per capita (current \$)			Income level classification		
	2016	2017	2018	2016	2017	2018
Angola	3,770	3,560	3,370	LM	LM	LM
Benin	820	800	870	L	L	L
Botswana	6,880	7,020	7,750	UM	UM	UM
Burkina Faso	600	590	670	L	L	L
Burundi	270	280	280	L	L	L
Cabo Verde	3,130	3,080	3,420	LM	LM	LM
Cameroon	1,380	1,340	1,440	LM	LM	LM
Central African Republic	410	440	490	L	L	L
Chad	730	640	670	L	L	L
Comoros	1,320	1,280	1,380	L	L	LM
Congo, Democratic Republic of	470	460	490	L	L	L
Congo, Republic of	1,820	1,480	1,640	LM	LM	LM
Côte d'Ivoire	1,490	1,480	1,600	LM	LM	LM
Djibouti	2,890	3,000	3,190	LM	LM	LM
Equatorial Guinea	8,260	7,080	6,840	UM	UM	UM
Eritrea	n.a.	n.a.	n.a.	L	L	L
Eswatini	3,660	3,590	3,930	LM	LM	LM
Ethiopia	670	740	790	L	L	L
Gabon	7,080	6,500	6,830	UM	UM	UM
Gambia	620	660	710	L	L	L
Ghana	1,830	1,900	2,130	LM	LM	LM
Guinea	780	820	850	L	L	L
Guinea-Bissau	650	680	750	L	L	L
Kenya	1,360	1,440	1,620	LM	LM	LM
Lesotho	1,320	1,250	1,390	LM	LM	LM
Liberia	620	620	610	L	L	L
Madagascar	470	470	510	L	L	L
Malawi	340	340	360	L	L	L

	GNI per capita (current \$)			Income level classification		
Mali	780	770	840	L	L	L
Mauritania	1,150	1,110	1,160	LM	LM	LM
Mauritius	10,640	11,000	12,050	UM	UM	UM
Mozambique	530	470	460	L	L	L
Namibia	4,980	4,800	5,220	UM	UM	UM
Niger	370	360	390	L	L	L
Nigeria	2,470	2,100	1,960	LM	LM	LM
Rwanda	720	730	780	L	L	L
São Tomé and Príncipe	1,700	1,700	1,890	LM	LM	LM
Senegal	1,270	1,280	1,410	L	L	LM
Seychelles	13,830	14,220	15,600	H	H	H
Sierra Leone	490	520	490	L	L	L
Somalia	n.a.	n.a.	n.a.	L	L	L
South Africa	5,470	5,410	5,750	UM	UM	UM
South Sudan	n.a.	n.a.	n.a.	L	L	L
Sudan	2,130	2,390	1,560	LM	LM	LM
Tanzania	970	970	1,020	L	L	L
Togo	600	600	660	L	L	L
Uganda	660	620	620	L	L	L
Zambia	1,380	1,300	1,430	LM	LM	LM
Zimbabwe	1,290	1,370	1,790	L	L	LM

Source: World Bank, World Development Indicators, “GNI (current US\$)” (accessed February 13, 2020); World Bank, “World Bank Country and Lending Groups – Historical Classification by Income” (accessed February 13, 2020).

Notes: n.a.=not available; L=low income; LM=low-middle income; UM=upper-middle income; H=high income. The classification of income level is based on gross national income (GNI) per capita. The thresholds change over time. In 2018, the thresholds for different income groups, measured as GNI per capita, are as follows: low income (L), <=\$1,025; lower-middle income (LM), \$1,026–\$3,995; upper-middle income (UM), \$3,996–\$12,375; and high income (H), >\$12,375. Source: World Bank, “World Bank Analytical Classifications: Current Classification and Historical Classification by Income” (accessed September 3, 2019).

**Table E.7** Ease of Doing Business Rankings, SSA countries, 2018

Economy	Global	Rank	Starting a	Dealing with	Getting	Registering	Getting	Protecting	Paying	Trading	Enforcing	Resolving
	Rank	within SSA	Business	Construction Permits	Electricity	Property	Credit	Minority Investors	Taxes	across Borders	Contracts	Insolvency
Angola	173	38	26	11	23	38	46	7	15	38	48	38
Benin	153	27	8	5	37	23	27	26	38	9	40	14
Botswana	86	5	31	2	17	5	14	6	6	3	25	7
Burkina Faso	151	25	12	6	41	30	27	26	26	15	35	13
Burundi	168	35	1	35	43	8	44	20	23	35	33	30
Cabo Verde	131	15	20	3	24	4	23	39	10	12	2	38
Cameroon	166	34	15	24	15	42	9	21	43	46	36	25
Central African Republic	183	44	44	43	44	39	27	26	46	31	46	33
Chad	181	43	46	33	38	26	27	37	47	37	31	33
Comoros	164	33	35	10	18	16	19	26	33	13	44	38
Congo, Democratic Republic of	184	45	9	37	35	34	27	39	41	47	43	38
Congo, Republic of	180	42	43	22	42	43	23	26	45	44	32	22
Côte d'Ivoire	122	13	3	28	19	15	6	26	37	30	16	6
Djibouti	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Equatorial Guinea	177	41	45	36	21	36	19	26	40	39	13	38
Eritrea	189	47	47	47	46	46	47	43	25	48	14	38
Eswatini	117	12	33	16	30	11	14	21	7	1	41	21
Ethiopia	159	29	37	38	16	29	43	44	19	27	4	31
Gabon	169	36	23	29	28	44	19	37	44	36	45	27
Gambia	149	24	38	21	27	24	23	39	34	11	20	26
Ghana	114	11	17	19	6	19	9	10	17	28	19	36
Guinea	152	26	19	4	20	27	27	26	42	34	21	18
Guinea-Bissau	175	40	32	42	40	22	27	21	27	25	39	38
Kenya	61	3	24	23	4	18	3	1	14	10	10	2
Lesotho	106	8	21	40	25	12	14	13	16	2	12	24
Liberia	174	39	13	46	34	47	18	45	9	40	42	15

Appendix E  
Data Tables

<b>Economy</b>	<b>Global Rank</b>	<b>Rank within SSA</b>	<b>Starting a Business</b>	<b>Dealing with Construction Permits</b>	<b>Getting Electricity</b>	<b>Registering Property</b>	<b>Getting Credit</b>	<b>Protecting Minority Investors</b>	<b>Paying Taxes</b>	<b>Trading across Borders</b>	<b>Enforcing Contracts</b>	<b>Resolving Insolvency</b>
Madagascar	161	30	14	45	45	35	19	10	20	21	30	28
Malawi	111	10	29	26	32	6	3	13	21	18	29	29
Mali	145	21	18	17	26	28	27	26	31	7	34	11
Mauritania	148	23	5	12	22	9	27	13	39	23	7	38
Mauritius	20	1	2	1	1	2	7	3	1	4	1	1
Mozambique	135	16	40	7	7	25	39	21	18	6	37	8
Namibia	107	9	39	9	3	41	9	10	11	20	3	23
Niger	143	19	4	34	29	14	27	26	29	17	22	17
Nigeria	146	22	22	31	33	48	5	5	28	42	11	32
Rwanda	29	2	6	15	2	1	1	2	4	5	8	3
São Tomé and Príncipe	170	37	28	18	12	40	39	47	22	16	47	38
Senegal	141	18	10	27	13	17	27	21	35	22	27	10
Seychelles	96	7	27	20	10	3	23	13	3	8	23	5
Sierra Leone	163	32	7	44	39	37	39	7	13	33	15	37
Somalia	190	48	48	47	46	33	47	48	48	32	17	38
South Africa	82	4	25	13	9	10	9	4	5	24	18	4
South Sudan	185	46	42	39	46	45	44	45	8	41	9	38
Sudan	162	31	30	14	11	7	39	42	30	45	28	20
Tanzania	144	20	34	32	5	31	7	19	32	43	5	19
Togo	137	17	11	25	8	21	27	26	36	19	26	9
Uganda	127	14	35	30	36	20	9	13	12	14	6	16
Zambia	87	6	16	8	14	32	1	13	2	26	24	12
Zimbabwe	155	28	41	41	31	13	14	9	24	29	38	35

Source: World Bank, "Doing Business 2018" (accessed February 5, 2020).

**Table E.8** Manufacturing value added (MVA) and manufactured exports per capita of SSA countries, and their global shares, 2015

Country	Global Ranking	MVA per capita (2010 constant \$)	Manufactured exports per capita (current \$)	Share of world MVA (%)	Share of manufactured trade (%)
Angola	132	206.4	20.4	<0.1	<0.1
Benin	n.a.	n.a.	n.a.	n.a.	n.a.
Botswana	84	454.2	2,683.5	<0.1	0.1
Burkina Faso	n.a.	n.a.	n.a.	n.a.	n.a.
Burundi	144	21.8	3.7	<0.1	<0.1
Cabo Verde	134	195.4	71.2	<0.1	<0.1
Cameroon	116	183.5	45.6	<0.1	<0.1
Central African Republic	143	52.7	3.7	<0.1	<0.1
Chad	n.a.	n.a.	n.a.	n.a.	n.a.
Comoros	n.a.	n.a.	n.a.	n.a.	n.a.
Congo, Republic of the	110	136.8	560.3	<0.1	<0.1
Côte d'Ivoire	104	153.0	93.0	<0.1	<0.1
Djibouti	n.a.	n.a.	n.a.	n.a.	n.a.
Equatorial Guinea	n.a.	n.a.	n.a.	n.a.	n.a.
Eritrea	145	29.6	0.5	<0.1	<0.1
Eswatini	81	1,441.3	888.9	<0.1	<0.1
Ethiopia	146	19.5	3.6	<0.1	<0.1
Gabon	109	471.5	647.7	<0.1	<0.1
Gambia	147	26.1	0.4	<0.1	<0.1
Ghana	121	90.6	79.0	<0.1	<0.1
Guinea	n.a.	n.a.	n.a.	n.a.	n.a.
Guinea-Bissau	n.a.	n.a.	n.a.	n.a.	n.a.
Kenya	102	118.6	58.9	<0.1	<0.1
Lesotho	n.a.	n.a.	n.a.	n.a.	n.a.
Liberia	n.a.	n.a.	n.a.	n.a.	n.a.
Madagascar	124	55.4	38.7	<0.1	<0.1
Malawi	130	46.7	16.5	<0.1	<0.1
Mali	n.a.	n.a.	n.a.	n.a.	n.a.
Mauritania	n.a.	n.a.	n.a.	n.a.	n.a.

Country	Global Ranking	MVA per capita (2010 constant \$)	Manufactured exports per capita (current \$)	Share of world MVA (%)	Share of manufactured trade (%)
Mauritius	87	1,291.7	1,260.0	<0.1	<0.1
Mozambique	127	43.3	25.1	<0.1	<0.1
Namibia	86	603.3	1,759.4	<0.1	<0.1
Niger	131	24.0	34.7	<0.1	<0.1
Nigeria	82	254.4	91.1	0.4	0.1
Rwanda	139	34.1	17.7	<0.1	<0.1
São Tomé and Príncipe	n.a.	n.a.	n.a.	n.a.	n.a.
Senegal	111	120.8	104.5	<0.1	<0.1
Seychelles	n.a.	n.a.	n.a.	n.a.	n.a.
Sierra Leone	n.a.	n.a.	n.a.	n.a.	n.a.
Somalia	n.a.	n.a.	n.a.	n.a.	n.a.
South Africa	47	952.2	876.5	0.4	0.4
South Sudan	n.a.	n.a.	n.a.	n.a.	n.a.
Sudan	n.a.	n.a.	n.a.	n.a.	n.a.
Tanzania	120	54.9	47.3	<0.1	<0.1
Togo	n.a.	n.a.	n.a.	n.a.	n.a.
Uganda	126	55.0	16.1	<0.1	<0.1
Zambia	118	126.2	66.6	<0.1	<0.1
Zimbabwe	n.a.	n.a.	n.a.	n.a.	n.a.

Source: United Nations Industrial Development Organization (UNIDO), *Industrial Development Report 2018* (accessed February 6, 2020).

Note: n.a. = not available.

**Table E.9** Logistic Performance Index, SSA countries, 2018

Country	Overall		Customs		Infrastructure		International Shipments		Logistics Quality and Competence		Tracking and Tracing		Timeliness	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Angola	2.1	159	1.6	160	1.9	153	2.2	143	2.0	155	2.0	157	2.6	140
Benin	2.8	76	2.6	82	2.5	83	2.7	83	2.5	98	2.8	87	3.4	57
Botswana	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Burkina Faso	2.6	91	2.4	100	2.4	95	2.9	60	2.5	106	2.4	124	3.0	95
Burundi	2.1	158	1.7	159	2.0	146	2.2	139	2.3	117	2.0	156	2.2	158
Cameroon	2.6	95	2.5	90	2.6	76	2.9	63	2.6	87	2.5	118	2.6	142
Cabo Verde	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Central African Republic	2.2	151	2.2	126	1.9	148	2.3	135	1.9	157	2.1	151	2.3	156
Chad	2.4	123	2.2	134	2.4	104	2.4	125	2.6	86	2.4	127	2.6	138
Comoros	2.6	107	2.6	72	2.3	113	2.5	116	2.2	138	2.9	68	2.8	120
Congo, Democratic Republic of	2.4	120	2.4	108	2.1	132	2.4	127	2.5	100	2.5	114	2.7	133
Congo, Republic of the	2.5	115	2.3	123	2.1	138	2.9	64	2.3	127	2.4	125	3.0	103
Côte d'Ivoire	3.1	50	2.8	51	2.9	56	3.2	45	3.2	37	3.1	49	3.2	71
Djibouti	2.6	90	2.4	113	2.8	60	2.5	118	2.3	135	2.9	72	3.1	85
Equatorial Guinea	2.3	136	1.9	151	1.9	151	2.9	62	2.3	133	2.1	149	2.8	126
Eritrea	2.1	155	2.1	137	1.9	152	2.1	154	2.2	146	2.2	145	2.1	159
Eswatini	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Ethiopia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Gabon	2.2	150	2.0	148	2.1	136	2.1	153	2.1	151	2.1	153	2.7	135
Gambia	2.4	127	2.1	141	1.8	155	2.7	87	2.2	142	2.8	73	2.7	131
Ghana	2.6	106	2.5	92	2.4	90	2.5	109	2.5	95	2.6	106	2.9	115
Guinea	2.2	145	2.5	93	1.6	160	2.3	132	2.1	152	2.7	91	2.0	160
Guinea-Bissau	2.4	129	2.0	144	1.8	159	2.5	108	2.3	126	2.8	80	2.9	116
Kenya	2.8	68	2.7	67	2.6	79	2.6	99	2.8	64	3.1	56	3.2	79
Lesotho	2.3	139	2.4	110	2.0	145	2.2	140	2.0	154	2.4	129	2.7	132

Country	Overall		Customs		Infrastructure		International Shipments		Logistics Quality and Competence		Tracking and Tracing		Timeliness	
Liberia	2.2	143	1.9	152	1.9	149	2.1	155	2.1	148	2.1	155	3.3	69
Madagascar	2.4	128	2.3	118	2.2	128	2.2	146	2.3	118	2.6	102	2.7	128
Malawi	2.6	97	2.4	94	2.2	126	2.6	105	2.7	82	2.7	94	3.0	102
Mali	2.6	96	2.2	133	2.3	109	2.7	88	2.5	107	3.1	54	2.8	119
Mauritania	2.3	135	2.2	128	2.3	112	2.2	145	2.2	144	2.5	119	2.7	134
Mauritius	2.7	78	2.7	59	2.8	59	2.1	151	2.9	59	3.0	63	3.0	99
Mozambique	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Niger	2.1	157	1.8	157	2.0	142	2.0	158	2.1	150	2.2	141	2.3	155
Namibia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nigeria	2.5	110	2.0	147	2.6	78	2.5	110	2.4	112	2.7	92	3.1	92
Rwanda	3.0	57	2.7	64	2.8	65	3.4	29	2.9	60	2.8	86	3.4	61
São Tomé and Príncipe	2.7	89	2.7	57	2.3	106	2.4	121	2.7	84	2.8	81	3.0	97
Senegal	2.3	141	2.2	130	2.2	118	2.4	128	2.1	149	2.1	150	2.5	145
Seychelles	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sierra Leone	2.1	156	1.8	155	1.8	156	2.2	147	2.0	156	2.3	134	2.3	154
Somalia	2.2	144	2.0	145	1.8	157	2.6	100	2.3	121	2.2	140	2.2	157
South Africa	3.4	33	3.2	34	3.2	36	3.5	22	3.2	39	3.4	35	3.7	34
South Sudan	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Sudan	2.4	121	2.1	136	2.2	125	2.6	102	2.5	96	2.5	115	2.6	139
Tanzania	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Togo	2.5	118	2.3	119	2.2	116	2.5	111	2.3	134	2.5	120	2.9	112
Uganda	2.6	102	2.6	76	2.2	124	2.8	78	2.5	99	2.4	123	2.9	110
Zambia	2.5	111	2.2	129	2.3	108	3.1	54	2.5	103	2.0	158	3.1	94
Zimbabwe	2.1	152	2.0	146	1.8	154	2.1	156	2.2	147	2.3	137	2.4	152

Source: World Bank, "Logistics Performance database" (accessed February 6, 2020).

Note: n.a. = not available

## **Appendix F**

# **Fastest-Growing U.S. Exports of Goods to SSA Countries in Percentage Change Terms**

## Fastest Growing U.S. Exports of Goods to SSA Countries in Percentage Terms

In terms of percentage changes, the largest increase in U.S. exports to sub-Saharan Africa (SSA) was in oilseeds. Other product groups, such as unwrought aluminum, malt beverages, fabricated structures, and frozen fish, also saw significant increases in U.S. exports in percentage change terms (table F.1). The factors driving this growth are discussed in the individual sector profiles below.

**Table F.1** U.S. exports to SSA countries, by leading growth product, in percentage change terms, 2016–18

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate, 2016–18
			Million \$		%
Total	13,484	14,066	15,868	2,384	8.5
Oilseeds	<sup>(a)</sup>	<sup>(a)</sup>	19	18	1,412.9
Unwrought aluminum	<sup>(a)</sup>	<sup>(a)</sup>	1	1	303.2
Malt beverages	<sup>(a)</sup>	1	1	1	255.8
Fabricated structures	4	23	43	39	216.7
Fresh or frozen fish	6	47	44	38	170.9
All other products	13,473	13,994	15,759	2,286	8.2

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Notes: Due to rounding, figures may not add up to totals shown. These merchandise sectors, known as “digest,” sectors, are defined by the Commission. Each USITC digest sector encompasses a number of 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The sectors are listed and defined in USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016.

<sup>a</sup> Less than \$500,000.

## Oilseeds

This product group includes oilseeds and oil-producing fruits (known as oleaginous fruits), such as olives, which are cultivated for oil and, in some cases, meal.<sup>1660</sup>

## Overview of U.S. Exports

U.S. oilseed exports to SSA have been highly variable in both value and composition.<sup>1661</sup> They were substantially less than a quarter of a million dollars in 2016 and 2017, but rose to \$19 million in 2018, driven by exports of soybeans to Nigeria and Ghana (table F.2). However, the data suggests neither country imported U.S. oilseeds in 2016 or 2017.<sup>1662</sup> South Africa and Mauritius were consistent markets for U.S. exports of flaxseed and sunflower seed during this period. Nonetheless, these exports were minimal: those to South Africa averaged about \$43,000 annually; to Mauritius, about \$8,000 annually.

<sup>1660</sup> Oil and meal are co-products derived from processing (or crushing) soybeans and other oilseeds. Soybeans accounted for the vast majority of U.S. oilseed exports to SSA in 2018. Other U.S. oilseeds produced and exported to SSA include flaxseed (also known as linseed), safflower seed, and sunflower seed.

<sup>1661</sup> USITC DataWeb/USDOC (accessed July 2, 2019, and September 17, 2019).

<sup>1662</sup> USITC DataWeb/USDOC (accessed July 2, 2019).

**Table F.2** Oilseeds: U.S. exports to SSA and selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
	Million \$				%
Oilseeds	0.1	( <sup>a</sup> )	19	18	1,412.9
Soybeans (not for seed)	( <sup>a</sup> )	( <sup>a</sup> )	18	18	( <sup>b</sup> )
Nigeria	( <sup>a</sup> )	( <sup>a</sup> )	15	15	( <sup>b</sup> )
Ghana	( <sup>a</sup> )	( <sup>a</sup> )	2	2	( <sup>b</sup> )
All other SSA	( <sup>a</sup> )	( <sup>a</sup> )	1	1	( <sup>b</sup> )
All other products	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	2.2

Source: USITC DataWeb/USDOC (accessed July 2, 2019); industry expert, interview by USITC staff, August 21, 2019. All products are in digest AG032. Oilseeds enter under HTS 1204.00.0000, 1207.60.0000, 1201.90.0095, 1206.00.0069, 1207.99.0392, 1206.00.0020, and 1207.40.0000.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Unable to calculate.

## Key Factors Affecting U.S. Exports in 2016–18

Soybeans made up 99.5 percent of U.S. oilseed exports to SSA in 2018. In 2017, they accounted for 66.5 percent of exports, while there were no exports of U.S. soybeans in 2016. Price is a major factor in finding an export market for U.S. soybeans in SSA, although an importer's ability to access foreign currency is also important.<sup>1663</sup> In 2018, the vast majority of soybeans exported to the SSA markets went to Nigeria (83.9 percent), followed by Ghana (12.6 percent).

In 2018, Nigeria's economy was returning to growth, albeit at low levels, after an economic recession; at the same time, U.S. soybean prices were low enough to support exports to the country.<sup>1664</sup> According to an industry expert, Nigeria is a very price-sensitive market, and it imports from the United States only if the price of imported U.S. soybeans is lower than the domestic price and prices from other suppliers.<sup>1665</sup> In the second half of 2018, U.S. soybean prices were low compared to those of its main global competitor, Brazil. This is attributed in large part to China's additional duties on U.S. soybeans,<sup>1666</sup> although other factors also put downward pressures on global soybean prices in 2018, including higher production (in the United States and elsewhere), as well as high stock levels.<sup>1667</sup> According to an industry

<sup>1663</sup> Industry representatives, interviews by USITC staff, Washington, DC, August 21, 2019.

<sup>1664</sup> While Nigeria's GDP growth was positive between 2013 and 2015, it declined during those years. In 2016, its GDP showed negative growth for the year. Nigeria's GDP then began to grow again—about 0.8 percent in 2017 and 1.9 percent in 2018. Industry experts, interviews by USITC staff, August 21, 2019; World Bank, World Development Indicators, "GDP Growth (Annual %): Nigeria" (accessed September 17, 2019); IMF, "Nigeria: Out of Recession," March 15, 2018.

<sup>1665</sup> Industry representative, interview by USITC staff, Washington, DC, August 21, 2019.

<sup>1666</sup> U.S. exports of soybeans to China fell 74 percent by both volume and value between 2017 and 2018, which many observers, both in the industry and at the U.S. Department of Agriculture, attribute to these additional duties. The decline in exports to China drove an overall decrease in U.S. soybean exports. USITC, *2018 Shifts in U.S. Merchandise Trade, 2018: Section 232 and 301 Trade Actions in 2018 and Agricultural Products*, December 2019.

<sup>1667</sup> Despite the Chinese tariffs, U.S. and Brazilian soybean prices did converge in December 2018 and remained close through May 2019. USDA, FAS, *Oilseeds*, November 2019; Government of China, Ministry of Finance, Taxation Committee Announcement [2018] No. 5, June 16, 2018; Sandler Travis, China 301 List 1 (accessed July 9, 2019); USDA, FAS, *Oilseeds*, November 2018, 2–3; USDA, FAS, PSD Online: Soybean; Production and Ending stocks

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representative, Nigeria primarily imports soybeans from Benin—although some of these imports are produced in Burkina Faso and shipped via Benin.<sup>1668</sup>

One industry representative did not anticipate notable U.S. exports to Nigeria in 2019, due to large amounts of imports from Benin and prices that do not favor Nigerian purchases of U.S. soybeans.<sup>1669</sup> However, there appears to be anticipation that in the longer term, demand factors—growing poultry and aquaculture production, related increases in feed manufacturing, and a failure of Nigerian soybean production to keep pace with demand—could benefit U.S. soybean exports to Nigeria.<sup>1670</sup> According to industry representatives, Nigeria is one of the easier countries in SSA for the United States to export to, both because it has approved imports of soybeans that are genetically modified organisms (GMOs) and because it has a functioning permit system that facilitates the shipment of GMO soybeans.<sup>1671</sup> GMO soybeans, which are banned in a number of SSA countries, make up about 95 percent of U.S. production.

In 2018, significant quantities of U.S. soybeans were exported commercially to Ghana for the first time in several decades.<sup>1672</sup> (Two shipments were made in 2018, but only one was commercial.)<sup>1673</sup> The commercial exports were part of a single shipment of non-GMO soybeans—Ghana has not approved sales of GMO soybeans—made possible by a monetization program supported by the U.S. government.<sup>1674</sup> The monetization program was connected to an initiative funded by the U.S. Department of Agriculture (USDA)—the Assist in the Management of Poultry and Layer Industries with Feed Improvement and Efficiency Strategies (AMPLIFIES) Ghana poultry project—run by World Initiative

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(accessed August 16, 2019); Zhou et al., “Evaluating Potential Long-Run Impacts of Chinese Tariff,” September 26, 2018; Turner, “September 2018 Soybeans Prices Recap,” October 1, 2018; USITC, *2018 Shifts in U.S. Merchandise Trade, 2018: Agricultural Products*, December 2019.

<sup>1668</sup> Industry representative, interview by USITC staff, Washington, DC, August 21, 2019.

<sup>1669</sup> Industry representative, interview by USITC staff, Washington, DC, August 21, 2019.

<sup>1670</sup> Industry representative, interview by USITC staff, Washington, DC, August 21, 2019; USDA, FAS, *Nigeria Animal Feed Sector Snapshot*, May 2019; USDA, FAS, *Nigeria's Oilseeds and Products Annual 2019*, July 2019. An industry representative estimated that poultry production is growing 15 to 20 percent annually and aquaculture is growing 25 to 30 percent annually. Soybean meal is a major component in feed for poultry and farmed fish.

<sup>1671</sup> Industry representatives, interviews by USITC staff, Washington, DC, August 21, 2019.

<sup>1672</sup> Trade data show only two years of U.S. soybeans exports (under HTS 1201) to Ghana between 1989 (when the U.S. Harmonized Tariff System began) and 2017. The larger of the two totals was \$132,462 exported in 2000. An industry expert stated that the last significant shipment to Ghana occurred around 1975. Industry representative, interview by USITC staff, Washington, DC, August 21, 2019; USITC DataWeb/USDOC (accessed September 17, 2019).

<sup>1673</sup> The other, noncommercial shipment was a container donated by the World Initiative for Soy in Human Health (WISHH). WISHH, “U.S. Soy Usage Grows in Ghana,” November 28, 2018. WISHH is group funded by U.S. soybean farmers (through the American Soybean Association) that works to develop value chains using soy in emerging markets, with the goal of enabling trade in soy in the long term. WISHH, “Origins, Mission and Vision” (accessed September 17, 2019).

<sup>1674</sup> Industry representatives, interviews by USITC staff, Washington, DC, August 21, 2019; WISHH, “U.S. Soy Usage Grows in Ghana,” November 28, 2018.

for Soy in Human Health.<sup>1675</sup> The soybeans were sold to three crushers who produced oil and meal to be sold domestically.<sup>1676</sup>

## Unwrought Aluminum<sup>1677</sup>

This product group covers upstream aluminum products, including primary and secondary unwrought aluminum, whether alloyed or not. It also covers aluminum ores and concentrates; waste and scrap; and slag, ash, and residues containing mainly aluminum.

### Overview of U.S. Exports

The value of U.S. exports of goods to SSA within the unwrought aluminum product group increased from \$87,000 in 2016 to \$1.4 million in 2018 (table F.3). The largest subcategory of these exports was aluminum waste and scrap (classified under 7602.00 in the global Harmonized System of tariff codes, or HS), which accounted for 98 percent of the total. In 2018, South Africa was responsible for more than 87.0 percent of U.S. exports to SSA of unwrought aluminum.

**Table F.3** Unwrought aluminum: U.S. exports to selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
			Thousand \$		%
Unwrought aluminum	87	66	1,409	1322	303.2
Aluminum waste and scrap	0	0	1,384	1,384	( <sup>a</sup> )
Kenya	0	0	35	35	( <sup>a</sup> )
Mali	0	0	122	122	( <sup>a</sup> )
South Africa	0	0	1,227	1,227	( <sup>a</sup> )

Source: USITC DataWeb/USDOC (accessed September 18, 2019). All products are in digest MM037. Aluminum waste and scrap enters under Schedule B 2620.40.0000, 7602.00.0090, 7601.20.9030, 7601.20.9500, 7601.20.9075, 7601.10.0000, and 2606.00.0090.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Unable to calculate.

### Key Factors Affecting U.S. Exports, 2016–18

One factor that likely contributed to the increased U.S. exports of unwrought aluminum to SSA was the decrease in Chinese demand for imports of aluminum waste and scrap. Global demand for aluminum waste and scrap (HS 7602.00) is dominated by China, which accounted for 23 percent of global waste and scrap imports in 2015. The United States is the largest exporter of aluminum waste and scrap; in 2015, it supplied 19 percent of global exports. However, in September 2017, China began to adopt

<sup>1675</sup> WISHH, “U.S. Soy Usage Grows in Ghana,” November 28, 2018.

<sup>1676</sup> Industry representative, interview by USITC staff, Washington, DC, August 21, 2019; WISHH, “U.S. Soy Usage Grows in Ghana,” November 28, 2018.

<sup>1677</sup> Unwrought aluminum includes products classified under HS 2606.00, 2620.40, and 7601–02.

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domestic policies that would significantly restrict its imports of metal scrap, including aluminum.<sup>1678</sup> China's import policies likely resulted in U.S. exporters searching for alternative markets.

Citing environmental concerns, the Chinese government notified the World Trade Organization (WTO) on November 15, 2017, of its intent to adopt new standards for the allowable contaminant thresholds for imports<sup>1679</sup> of certain waste and scrap materials. On April 19, 2018, the Chinese government announced it would restrict imports of certain scrap materials, including materials "for the recovery of aluminum," beginning December 31, 2018. Furthermore, in response to the U.S. section 232 and section 301 tariffs, China imposed an initial 25 percent tariff on imports from the United States of scrap products and 50 percent on imports of U.S. aluminum products. Chinese imports of scrap aluminum were down nearly 47 percent from August 2018 to October 2018.<sup>1680</sup> A combination of less demand from China and an increase in domestic supply led to a U.S. price drop<sup>1681</sup>—U.S. prices for aluminum scrap salvaged from shredded autos were down by more than 20 percent from early 2018.<sup>1682</sup>

In response to losing significant access to the Chinese market, U.S. exporters have pivoted to emerging export markets such as South Africa. U.S. exports to SSA are in line with increases in other emerging markets.<sup>1683</sup>

Data from the Aluminum Association shows that recovery of secondary aluminum in South African smelters averaged 60,000 metric tons from 2007 to 2017.<sup>1684</sup> Additionally, trade data suggest that South African imports increased by more than 2,700 metric tons, while the country's exports increased by more than 11,600 metric tons in 2018. This suggests that demand has remained relatively stable and that South Africa may be re-exporting some of the scrap aluminum that it imported from the United States.

Economic growth in Africa remains high, and SSA has some of the most rapidly growing economies in the world.<sup>1685</sup> There is some short-term opportunity for continued unwrought aluminum export growth to SSA countries. Additionally, scrap exporters are searching for emerging markets, and industry analysis points to India and various countries in South America and Africa as having growth potential.<sup>1686</sup>

<sup>1678</sup> Buxbaum, "\$5 Billion in US Scrap Exports in Jeopardy," February 28, 2018.

<sup>1679</sup> *Recycling Today*, "China Releases New Proposed Contaminants Thresholds," November 16, 2017.

<sup>1680</sup> Taylor, "China Scrap Imports Decline," October 24, 2018.

<sup>1681</sup> The Resource Recycling site estimated that UBC scrap was trading for \$0.74 to \$0.76 cents per pound (approximately \$1,480 to \$1,520 per ton) in early 2018. (UBC scrap is most common scrap aluminum grade handled by materials recovery facilities.) Scrap Monster estimated that UBC scrap prices were \$0.58 per pound (approximately \$1,160 per ton) on June 20, 2019. Note: 2,000 pounds per ton at \$0.58 is equivalent to \$1,160.

<sup>1682</sup> Aluminum Recyclers Council, "Aluminum Scrap Booming Thanks to Tariffs," January 16, 2019.

<sup>1683</sup> MacAulay, "US Non-ferrous Exporters Work to Replace China," August 13, 2018; Toto, "Aluminum Seeks Its Luster," April 3, 2019. Total U.S. aluminum scrap exports increased 12 percent in 2018 to 1.76 million metric tons. Sharp increases in shipments to Vietnam (672 percent), India (174 percent), Malaysia (228 percent), Indonesia (104 percent) and Taiwan (129 percent) compensated for the 41 percent decline in exports (value and quantity) to China.

<sup>1684</sup> Aluminum Association, *World Consumption Data, 2007–17*.

<sup>1685</sup> Adegoke, "Africa Will Have Some of the World's Fastest-growing Economies," January 13, 2019.

<sup>1686</sup> Pyzyk, "ISRI Commodities Roundtable: China and Tariffs," September 10, 2018.

## Malt Beverages

### Overview of U.S. Exports

U.S. exports of malt beverages (composed entirely of beer made from malt) to SSA countries increased from \$114,000 in 2016 to \$1.4 million in 2018 (table F.4). U.S. exports to South Africa increased significantly over the period and accounted for most of this growth. In 2016, the United States did not export any beer to South Africa, but in 2017, U.S. beer exports to South Africa increased to \$608,000, representing 76.9 percent of total U.S. exports of this beverage to SSA. By 2018, U.S. exports to South Africa had more than doubled, reaching \$1.3 million and accounting for 92.2 percent of total U.S. beer exports to SSA countries. Despite this significant growth rate, South Africa (and other SSA countries) are currently minor markets for U.S. beer exports. In 2018, U.S. exports of beer to South Africa accounted for only 0.2 percent of total U.S. beer exports worldwide (\$673 million).<sup>1687</sup>

**Table F.4** Malt beverages: U.S. exports to SSA and selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change 2016–18	Compound annual growth rate (CAGR)
					2016–18
		Million \$			%
Beer made from malt	0.1	0.8	1.4	1.3	255.8
South Africa	0.0	0.6	1.3	1.3	( <sup>a</sup> )
Chad	0.0	0.1	0.0	0.0	( <sup>a</sup> )
Sierra Leone	0.1	0.0	0.0	-0.1	-100.0
Kenya	0.0	0.0	0.0	0.0	5.0
All other SSA	0.0	0.0	0.1	0.0	13.0

Source: USITC DataWeb/USDOC. All products are in digest AG040. Malt beverages enter under Schedule B statistical reporting number 2203.00.0000.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Unable to calculate.

### Key Factors Affecting U.S. Exports, 2016–18

Africa's \$13 billion beer market is relatively small compared to those of other regions, but it is the world's fastest growing one.<sup>1688</sup> While beer consumption is declining on a global basis, in Africa, it is expected to rise. In 2017, Africans consumed 13.5 million kiloliters of beer in total, accounting for 7 percent of global beer consumption.<sup>1689</sup> African beer consumption is predicted to increase 5 percent from 2015 to 2020, compared to lower growth rates in more mature markets like Europe or North America, where growth rates of 1 percent or less are expected.<sup>1690</sup> Factors such as growing populations,

<sup>1687</sup> USITC DataWeb/USDOC. This represents the value of U.S. domestic exports of Schedule B 2203.00.0000.

<sup>1688</sup> Fick, "Multinational Brewers Look to Tap," April 18, 2017.

<sup>1689</sup> Kirin Holdings, "Kirin Beer University Report Global Beer Consumption," December 20, 2018.

<sup>1690</sup> Beverage Daily, "Africa: The Fastest Growing Beer Market," January 12, 2016.

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a large youth population increasingly eligible for legal alcohol consumption, rising GDP, and increasing urbanization contribute to the growth in the beer market in the African region.<sup>1691</sup>

As a result of growing demand, both domestic and multinational brewers perceive the African market as having long-term growth and profit potential.<sup>1692</sup> South Africa is a large market for alcoholic beverages in Africa, and beer is the most popular alcoholic beverage there, with growing demand for craft beer.<sup>1693</sup> In 2018, South Africans consumed 3.2 billion liters of beer, which accounted for about 75 percent of total South African consumption of alcoholic beverages.<sup>1694</sup>

South Africa's beer market is largely controlled by multinational brewers. It was historically dominated by South African Breweries (SAB), a leading global brewer. However, Anheuser-Busch InBev NV/SA (ABI), the world's largest brewer (with a significant U.S. ownership), recently acquired SAB Miller, and the South African beer market is now largely controlled by ABI. ABI accounted for 87 percent of South African beer production in 2018, followed by Heineken South Africa, which supplied almost all remaining production (12 percent); craft brewers supplied less than 1 percent.<sup>1695</sup> Reflecting South African consumers' demand for a variety of beers at different price points, including the value segment, SAB continues to produce some of the most popular less-expensive brands, including Castle and Carling Black Label. However, ABI expects that its global brands, like Budweiser, Stella Artois, and Corona, may help drive future growth in the South African market.<sup>1696</sup>

The craft beer segment may be a contributing factor to US beer export growth, in part because demand for craft beer has been growing in South Africa. Limited local craft beer production may also be a contributing factor to the increase of U.S. exports of beer to South Africa. The South African craft beer market, estimated to be \$100 million in 2018, is expected to grow by more than 3 percent a year for the next several years.<sup>1697</sup> The relatively new South African craft beer industry is rapidly growing in number of breweries, and there are now over 200 active craft breweries in South Africa, according to the South African Craft Brewer's Association.<sup>1698</sup> However, while there are more domestic craft breweries, they still account for less than 1 percent of total domestic beer production, even as domestic craft beer production is increasing.<sup>1699</sup>

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<sup>1691</sup> Beverage Daily, "Africa: The Fastest Growing Beer Market," January 12, 2016; *Mail and Guardian* (South Africa), "Cheers to the World's Fastest Growing Beer Market," August 3, 2017. By 2020, there will be over 200 million people between the ages of 15 and 24 in Africa. This segment of the population will reportedly account for 20 percent of sub-Saharan Africa's total population.

<sup>1692</sup> Fick, "Multinational Brewers Look to Tap," April 18, 2017. Motsoeneng, "Beer Maker ABInBev Pumps Up the Volume," May 22, 2018.

<sup>1693</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019; MarketLine, "Beer and Cider in South Africa," January 2019.

<sup>1694</sup> South African Wine Industry Statistics, 2018.

<sup>1695</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>1696</sup> South African Breweries is now a subsidiary of ABI, operating seven breweries with an annual brewing capacity of 3.1 billion liters. SAB website <http://www.sab.co.za/> (accessed October 2019); Fick, "Multinational Brewers Look to Tap," April 18, 2017.

<sup>1697</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019.

<sup>1698</sup> Craft Brewers Association of South Africa, "Resources" (accessed November 13, 2019).

<sup>1699</sup> Craft beer production reached 27 million liters in 2018, almost double its volume of 15 million liters in 2014. USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients to South Africa*, April 25, 2019.

Despite the growth of the local craft beer industry, global brewers are taking advantage of the rise in craft beer consumption to introduce and establish their own craft brands. While Heineken and ABI promote their primary beer brands in South Africa, both also recently introduced some craft beer brands to the market.<sup>1700</sup> Multinational brewers have reportedly begun offering imported craft beers at prices that are comparable to those of locally brewed craft beers.<sup>1701</sup> For example, following Heineken's acquisition of Lagunitas, a large and successful American craft brewery based in California, Heineken began introducing Lagunitas brand beers to craft beer consumers in large urban centers in South Africa with affluent populations.<sup>1702</sup>

## Fabricated Structures<sup>1703</sup>

This product group covers articles of iron or steel, including bridges and bridge sections, towers and lattice masts, and equipment for scaffolding, shuttering, and propping or pit-propping. It also covers angles, shapes, and sections.

### Overview of U.S. Exports

U.S. exports of fabricated structures to SSA grew strongly from \$4 million in 2016 to \$43 million in 2018, representing a CAGR of 216.7 percent. The largest subcategory of these exports is classified in Schedule B statistical reporting number 7308.10.0000, which contains bridges and bridge sections of iron or steel and accounted for 86.1 percent of the U.S. export total in 2018 for this product group. Cameroon and Zambia were the leading destinations for U.S. exports of subheading 7308.10.0000 between 2016 and 2018, with exports of these goods increasing by more than \$37 million and accounting for more than 94.9 percent of the total change in the broader category of fabricated structures. Cameroon and Zambia accounted for 52.1 percent (\$23 million) and 32.2 percent (\$14 million) of total U.S. exports of fabricated structural steel to SSA in 2018. Notably, there were no exports of bridge and bridge sections to Cameroon and Zambia in 2016 (table F.5).

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<sup>1700</sup> American Craft Beers, "African Beers on the Export Horizon," April 14, 2017. ABI will reportedly sell eight African beer brands outside of Africa, including Castile (South Africa), Kilimanjaro (Tanzania), and Hero (Nigeria).

<sup>1701</sup> USDA, FAS, *Prospects for U.S. Exports of Craft Beer Ingredients*, April 25, 2019. Multinational brewers are also investing in the South African craft beer market through acquisitions. For example, Heineken acquired Stellenbrau, a craft brewer near Cape Town, and invested in Soweto Brewing Company in 2017. Foodbev Media, "Heineken Acquires South African Craft Brewery Stellenbrau," March 31, 2017; DrinkStuff South Africa, "Heineken Takes Another Gulp of SA Craft Beer," October 1, 2017.

<sup>1702</sup> Imported Lagunitas beers are reportedly sold at prices (R149.99 per six-pack, or \$10.20) that are competitive with craft beers produced by South African brewers. Several South African craft beers are sold online at similar price ranges. Exchange rate from XE Currency Converter, <https://www.xe.com/currencyconverter> (accessed November 17, 2019). The Brewmistress, "Big Name Beer Imports to South Africa-Bonus or Burden?" July 30, 2019; Turner, "Friday Beer—Lagunitas Brewing Co IPA," September 21, 2018.

<sup>1703</sup> Structural steel is classified under Schedule B 7301.20, 7308.10, 7308.20, 7308.40, and 7308.90.

**Table F.5** U.S. exports of fabricated structures to SSA and to selected SSA countries, 2016–18

Product and destination country	2016	2017	2018	Absolute change	Compound annual growth rate (CAGR)
				2016–18	2016–18
		Million \$			%
Fabricated structures	4	23	43	39	216.7
Bridges and bridge sections	<sup>(a)</sup>	14	37	37	917.3
Cameroon	0	12	22	22	<sup>(b)</sup>
Zambia	0	0	14	14	<sup>(b)</sup>
All other SSA	<sup>(a)</sup>	1.7	1	1	55.7
All other products	4	9	6	2	23.5

Source: USITC DataWeb/USDOC (accessed July 25, 2019). All products are in digest MM027. Bridges and bridge sections enter under Schedule B statistical reporting number 7308.10.0000.

Notes: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Unable to calculate.

## Key Factors Affecting U.S. Exports, 2016–18

Trade in steel structures is irregular, given that exports tend to have a direct link to specific infrastructure projects abroad. Many projects are also subject to a bid process where the winning bidder is awarded the entire project. One factor that increased U.S. exports of fabricated structures to SSA was the development of several specific infrastructure projects throughout the SSA region in which U.S. firms were successful bid participants. For example, in 2017, U.S.-based Acrow Bridge furnished 10 modular steel bridges to the United Nations Multidimensional Integrated Stabilization Mission in the Central African Republic (MINUSCA). The bridges were placed in various locations throughout the country where quality bridge infrastructure solutions were particularly critical. Acrow Bridge also delivered a batch of 44 modular bridges to the government of Cameroon in 2018.<sup>1704</sup>

## Frozen or Fresh Fish

The frozen or fresh fish category encompasses frozen or fresh finfish of all species, whether frozen whole or in cuts such as fish fillets. Frozen types of other seafood, such as shrimp or oysters, are not included.

## Overview of U.S. Exports

The value of U.S. frozen fish exports to SSA recovered from a temporary low of \$6 million in 2016 to a more typical level of \$44.0 million in 2018, for a CAGR of 170.9 percent. The vast majority of frozen fish exports to SSA (89.3 percent in 2018) were of whitefish species in the hake and whiting family, and most of these were of a species known as Pacific whiting that is caught by the U.S. fishing industry in the

<sup>1704</sup> The prefabricated bridges project included extensive training of local engineers and technicians in the assembly, installation, and maintenance of the bridges. The purpose of the project was to repair and modernize Cameroon's rural infrastructure to develop regional trade and to provide easier access to schools and medical clinics, as well as other basic goods and services. Acrow Bridge, "Installation of 44 Acrow Bridges Begins," May 1, 2019.

northern Pacific. Key SSA destinations for U.S. hake and whiting are South Africa, Nigeria, Ghana, Angola, and Côte d'Ivoire (table F.6).

**Table F.6** Frozen or fresh fish: U.S. exports to SSA, by product, 2016–18

Product and destination country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
	Million \$				%
Frozen or fresh fish	6	47	44	38	170.9
Frozen or fresh hake and whiting	3	44	39	36	261.8
South Africa	2	5	13	12	178.2
Nigeria	0	14	9	9	<sup>(b)</sup>
Ghana	<sup>(a)</sup>	8	7	7	426.0
Angola	0	<sup>(a)</sup>	4	4	<sup>(b)</sup>
Côte d'Ivoire	<sup>(a)</sup>	3	4	4	1,842.0
Cameroon	1	9	1	<sup>(a)</sup>	21.6
All other SSA	<sup>(a)</sup>	5	<sup>(a)</sup>	<sup>(a)</sup>	48.4
Frozen mackerel	0	<sup>(a)</sup>	1	1	<sup>(b)</sup>
All other products	3	3	3	<sup>(a)</sup>	6.5

Source: USITC DataWeb/USDOC (accessed September 5, 2019). All products are in digest AG006. Frozen hake and whiting enters under Schedule B statistical reporting number 0303.66.0000 (fresh and frozen fish), which encompasses all HTS/Schedule B statistical reporting numbers 0302–0304.

Notes: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Unable to calculate.

## Key Factors Affecting U.S. Exports, 2016–18

The increase in U.S. exports of Pacific whiting to SSA between 2016 and 2018 was driven primarily by supply factors. Exports of the fish to SSA fell rapidly in 2015 and 2016 due to a 2015 collapse in the population of the fish within the normal U.S. fishing grounds. According to industry sources, the fish were found far to the west of their typical areas during this period, causing many U.S. fishing vessels to catch only a small fraction of what they usually harvest.<sup>1705</sup> Overall, U.S. catch of Pacific whiting fell from 260,783 metric tons (mt) in 2014 to 151,183 mt in 2015.<sup>1706</sup> However, the catch recovered to 253,128 mt in 2016 and 351,052 mt in 2017, with the result that a larger supply was available to export to SSA in 2017 and 2018.<sup>1707</sup>

SSA has become an increasingly important market for U.S. frozen Pacific whiting as producers have looked to diversify their export markets. According to an industry representative, this was especially true during the 2016–18 period, because U.S. exporters were affected by volatility in the Ukrainian

<sup>1705</sup> *Chinook Observer*, “Warm Ocean Possible Culprit in 2015 Hake Collapse,” March 8, 2016.

<sup>1706</sup> NOAA, *Fisheries of the United States 2014*, September 2015, 12; NOAA, *Fisheries of the United States 2015*, September 2016, 12.

<sup>1707</sup> Because the fish are typically harvested in the fall and then frozen, exports in any year mostly reflect the prior calendar year’s harvest. NOAA, *Fisheries of the United States 2016*, September 2017, 16; NOAA, *Fisheries of the United States 2017*, September 2018, 15.

## Fastest Growing U.S. Exports of Goods to SSA Countries in Percentage Terms

market and by trade restrictions in Russia; these two countries are historically among the leading markets for U.S. Pacific whiting.<sup>1708</sup>

Growing demand for fish in SSA also contributed to the importance of these markets as destinations for U.S. exports in 2017 and 2018. Pacific whiting caught in the United States is similar to several hake and whiting species produced in SSA and therefore seems familiar to consumers there. As a result, these species are likely to be in demand as seafood consumption increases in tandem with growth in per capita incomes, particularly in years when domestic or regional supply in SSA countries is scarce. In 2018, South Africa became the 2nd-largest market in the world for U.S. exports of frozen Pacific whiting, up from the 10th-largest in 2017. South African demand for U.S. exports is particularly strong in years when its domestic supply of hake is low.<sup>1709</sup> Similarly, Nigeria was the second-largest market in the world for U.S. exports of frozen U.S. Pacific whiting in 2017, despite recording no imports of these goods from the United States in 2016.<sup>1710</sup> Nigeria sets import quotas on fish in order to stimulate domestic production, and quota volumes can change significantly from year to year, affecting U.S. export volumes.<sup>1711</sup> Smaller countries such as Angola, Ghana, and Côte d'Ivoire also started to import from the United States during 2016–18, albeit in smaller volumes.

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<sup>1708</sup> Industry representative, email message to USITC staff, November 15, 2019.

<sup>1709</sup> Industry representative, email message to USITC staff, November 15, 2019.

<sup>1710</sup> USITC DataWeb/USDOC, U.S. domestic exports of HTS 0303.66 (accessed September 26, 2019).

<sup>1711</sup> Industry representative, email message to USITC staff, November 15, 2019.

## **Appendix G**

# **Fastest-Growing U.S. Imports of Goods from SSA Countries in Percentage Change Terms**

## Fastest-Growing U.S. Imports of Goods from SSA Countries in Percentage Change Terms

This appendix gives an overview of U.S. imports of goods from SSA countries which grew the fastest in percentage change terms for the period 2016–18.<sup>1712</sup> It also examines the key factors behind their growth. In terms of percentage change in U.S. imports from sub-Saharan Africa (SSA), the largest increase by percentage for a product was in saturated polyester resins.<sup>1713</sup> The major reasons for the increase in imports for this product were (1) bankruptcy of one of the major U.S. product manufacturers, (2) new U.S. antidumping and/or countervailing duties placed on a number of foreign countries, (3) South Africa’s GSP eligibility, and (4) an increase in plant capacity for polyethylene terephthalate (PET) resin production in South Africa. Three other product sectors that saw relatively high percentage change increases were iron and steel waste and scrap; zinc and related articles; and blank and prerecorded media (table G.1).

**Table G.1** U.S. imports from SSA countries, by leading growth product, in percentage change terms 2016–18

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR) 2016–18
Million \$					%
Total	20,160	24,857	25,075	4,915	11.5
Saturated polyester resins	( <sup>a</sup> )	( <sup>a</sup> )	53	53	42,104.8
Blank and prerecorded media	2	2	28	27	296.7
Iron and steel waste and scrap	( <sup>a</sup> )	( <sup>a</sup> )	6	6	2,998.1
Zinc and related articles	( <sup>a</sup> )	( <sup>a</sup> )	6	6	1,083.2
All other products	20,158	24,852	24,981	4,823	11.3

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Notes: Due to rounding, figures may not add up to totals shown. Each USITC digest sector is a merchandise sector that encompasses a number of 8-digit subheadings in the *Harmonized Tariff Schedule of the United States* (HTS), which classifies tradable goods. The digest sectors are defined and listed by USITC. USITC, “Frequently Asked Questions,” *Shifts in U.S. Merchandise Trade 2015*, September 2016.

[https://www.usitc.gov/sites/default/files/research\\_and\\_analysis/tradeshifts/2015/d3/digest\\_hts8\\_dir\\_final.pdf](https://www.usitc.gov/sites/default/files/research_and_analysis/tradeshifts/2015/d3/digest_hts8_dir_final.pdf).

<sup>a</sup> Less than \$500,000.

## Saturated Polyester Resins

The products covered under saturated polyester resins include polylactic acid, polyethylene terephthalate (PET), polybutylene terephthalate, thermoplastic liquid crystal aromatic polyester copolymers, and other saturated polyesters.<sup>1714</sup> PET resin is a commodity-grade thermoplastic polyester resin produced from purified terephthalic acid and monoethylene glycol. The resin is primarily sold in bulk form as chips or pellets to downstream consumers or converters that process them into finished products, particularly packaging material for food and nonfood products. The products are relatively

<sup>1712</sup> Two digests—inorganic acids and scales and weighing machinery—are not discussed because although they are among the fastest-growing sectors in percentage change terms, the increase of U.S. imports in value terms was very small (less than \$1 million from 2016 to 2018).

<sup>1713</sup> USITC DataWeb/USDOC (accessed July 2, 2019). Data are for USITC digest CH029.

<sup>1714</sup> The products in this section are in USITC digest CH029. Saturated polyester resins enter under HTS 3907.60.00, 3907.61.00, and 3907.99.50.

lightweight and have other useful qualities such as relatively high strength, transparency, thermal stability, and impact resistance.

## Overview of U.S. Imports

U.S. imports of PET resins from South Africa rose in value from \$0 in 2016 to \$53 million in 2018 (table G.2). In 2016, a minimal amount (less than \$500,000 in value) of PET resins from Sierra Leone was imported, and in 2018, there was a decrease to zero imports of all products classified under saturated polyester resins. In 2016, there were no imports of any saturated polyester resins from Republic of the Congo while in 2018 a minimal amount of other saturated polyesters<sup>1715</sup> (less than \$500,000 in value) was imported.

**Table G.2** Saturated polyester resins: U.S. Imports from SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
	Million \$				%
Saturated polyester resins	( <sup>a</sup> )	0	53	53	42,104.8
South Africa	0	0	53	53	( <sup>b</sup> )
Republic of the Congo	0	0	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )
Sierra Leone	( <sup>a</sup> )	0	0	( <sup>c</sup> )	( <sup>b</sup> )
All other SSA countries	0	0	0	0	( <sup>b</sup> )

Source: USITC DataWeb/USDOC (accessed July 2, 2019). All products are in digest CH029. Saturated polyester resins enter under statistical reporting numbers 3907.60.00, 3907.61.00, and 3907.99.50.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Unable to calculate

<sup>c</sup> Absolute change was negative, less than \$500,000.

However, the PET resins imported from Sierra Leone and South Africa, respectively, have different physical properties. Their intrinsic viscosity (which is measured in number ranges) varies, and these physical properties lead to different downstream uses (table G.3).<sup>1716</sup> The product from Sierra Leone is currently classified under HTS 3907.69.00,<sup>1717</sup> which covers PET resins with a viscosity of less than 78 milliliters per gram (ml/g). On the other hand, the product from South Africa is classified under HTS 3907.61.00, covering PET resins having a viscosity number of 78 ml/g or higher.<sup>1718</sup>

<sup>1715</sup> Other saturated polyester resins are classified under HTS 3907.99.5050. USITC DataWeb/USDOC (accessed September 26, 2019).

<sup>1716</sup> The *Harmonized Tariff Schedule of the United States* (HTS) classifies PET resin in two HTS subheadings, 3907.61.00 and 3907.69.00, depending on the viscosity number. The associated viscometer method used for determining the intrinsic viscosity number is defined as ASTM D4603. PTI, “Solution Intrinsic Viscosity,” n.d. (accessed October 22, 2019).

<sup>1717</sup> From 2014 to 2016, all PET resin was classified in HTS statistical reporting number 3907.60.00. In 2017, HTS subheading 3907.60.00 was deleted and replaced with HTS subheadings 3907.61.00 and 3907.69.00, which are differentiated by intrinsic viscosity number.

<sup>1718</sup> USITC DataWeb/USDOC (HTS statistical reporting numbers 3907.61.00; accessed September 26, 2019).

**Table G.3** Polyethylene terephthalate resin products by viscosity range, milliliters per gram (ml/g), and downstream uses, HTS statistical reporting numbers 3907.61.00 and 3907.69.00

PET resin product	HTS 3907.69.00 viscosity (ml/g)	HTS 3907.61.00 viscosity (ml/g)	Downstream uses
Fiber-grade	40–70		Textiles including shirts, pants, fiberfill, women’s knits, upholstery, carpets
Bottle-grade for water	70 to <78		Water bottles
Bottle-grade for hot-fill applications		78–82	Hot fill bottles
Bottle-grade for soft drinks		≤88	Soft drink bottles
Crystallizable PET resin (C-PET)		89	Freezer and frozen food trays
PET glycol (PETG)		>88	Blister packs and other types of mold-to-shape packaging, thick film, protective covers, and retail displays

Source: Based on Gupta and Bashir, “PET Fibers, Films, and Bottles,” *Handbook of Thermoplastic Polyesters*, 2002; IHS Markit, “Polyethylene Terephthalate (PET) Solid-State Resins,” *Chemical Economics Handbook*, March 2018; USITC hearing transcript in connection with Inv. No. 332-572, *Generalized System of Preferences: Possible Modifications, 2018 Review*, July 3, 2019.

## Key Factors Affecting U.S. Imports, 2016–18

Factors affecting U.S. imports included bankruptcy of one of the major U.S. manufacturers, new U.S. antidumping and/or countervailing duties placed on a number of foreign countries, South Africa’s GSP eligibility, and an increase in plant capacity for PET resin production in South Africa.

### U.S. Production and U.S. Market Demand

The U.S. PET resin industry consists principally of four subsidiaries of large multinational producers.<sup>1719</sup> One of them, M&G Chemicals, filed for bankruptcy in October 2017, which resulted in a temporary domestic supply disruption. When M&G went bankrupt, its assets were put up for sale. M&G Chemicals’ PET resin plant in West Virginia was purchased in the second half of 2018 by Far Eastern New Century, headquartered in Taiwan.<sup>1720</sup> The plant being built by M&G in Corpus Christi, Texas, was sold for \$1.1 billion. That plant is currently not operational.<sup>1721</sup> Due to the temporary supply disruption from the M&G

<sup>1719</sup> DAK Americas, LLC (DAK) is a wholly owned subsidiary of Mexico-based ALFA S.A.B. de C.V. and produces PET resin in North Carolina, South Carolina, and Mississippi. Indorama Ventures Public Company Limited (Indorama Ventures) has headquarters in Thailand and produces PET resin in North Carolina, South Carolina, and Alabama. Nan Ya Plastics Corporation, America, a wholly owned subsidiary of Nan Ya Plastics Corporation of Taiwan, has a PET resin plant in South Carolina. When M&G Chemicals went bankrupt, Far Eastern New Century bought the M&G plant in West Virginia.

<sup>1720</sup> PET Resin Coalition, “Petition for Withdrawal of GSP Duty Free Treatment for PET Resin from Pakistan,” Generalized System of Preferences petition to USTR, April 18, 2019, 2.

<sup>1721</sup> The Texas plant had been scheduled to produce between 1.1 and 1.3 million metric tons of purified terephthalic acid (PTA), a raw material, and PET resin. The plant’s commissioning is tentatively scheduled for May 2020. There are also plans to build a PTA facility, and its commissioning is scheduled for July 2021. Acosta, “Corpus

bankruptcy and the anticipated supply of the new plant not coming to market, buyers had to search elsewhere for product availability. SSA countries had a ready source of saturated polyester resins.

U.S.-produced and imported PET resin generally compete directly.<sup>1722</sup> Data indicate that apparent U.S. consumption of bottle-grade PET resin increased by 2.6 percent from 2015 to 2017.<sup>1723</sup> According to industry representatives, U.S. PET resin consumption is expected to continue to grow.<sup>1724</sup> Increasing U.S. demand likely also contributed to the increase of U.S. imports of PET resins from SSA.

## U.S. Imports under the Generalized System of Preferences

Imports of PET resin from SSA countries are currently eligible to enter the United States duty free under the Generalized System of Preferences (GSP) for PET resin, which keeps them attractive to U.S. buyers compared to products imported from other countries. The GSP plays an important role in U.S. imports, and it allows South Africa to have a competitive advantage over other countries that are not eligible for the program. In 2018, imports from GSP-eligible countries accounted for 25.0 percent of the total value of U.S. imports classified in HTS subheading 3907.61.00. Imports from South Africa accounted for 4.3 percent of the total value of U.S. imports and 17.2 percent of all GSP imports classified under HTS subheading 3907.61.00.<sup>1725</sup> All of the \$53 million in imports of saturated polyester resins from South Africa in 2018 came in under the GSP tariff rates.

## U.S. Imports in the Context of Competition between SSA and Non-SSA Countries

Among the non-SSA sources of imports, some countries were affected by U.S. antidumping and countervailing duty orders. Currently, there are antidumping duty orders in effect on Canada, China, India, and Oman, and countervailing duty orders on India and China that went into effect in 2016.<sup>1726</sup> There were preliminary antidumping orders on Brazil, Indonesia, South Korea, Pakistan, and Taiwan that

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Christi Polymers Set to Resume Work on M&G plant in May," February 19, 2019.

<sup>1722</sup> U.S. production of PET resin spans the range of viscosity numbers, including fiber-grade (40–70 ml/g), bottle-grade (70–88 ml/g), crystallizable (89 ml/g), and polyethylene terephthalate glycol (> 88 ml/g).

<sup>1723</sup> USITC, *Polyethylene Terephthalate Resin from Brazil, Indonesia, Korea, Pakistan, and Taiwan*, 2018, IV-21.

<sup>1724</sup> USITC hearing transcript for the Generalized System of Preferences, July 2, 2019, 119 (testimony of Ricky Lane, DAK Americas).

<sup>1725</sup> U.S. producers (under the name "The PET Resin Coalition") contended that GSP eligibility played an important role in competition in the U.S., as evidenced by the numerous petitions they filed with USTR over multiple years to remove foreign countries from GSP eligibility. The PET Resin Coalition previously requested the removal of HTS statistical reporting number 3907.60.00 from GSP eligibility for certain countries: in 2003 for all Beneficiary Developing Countries, and in 2008 for India and Indonesia. Both requests were reviewed, but the President did not grant the removals. In 2008, Indonesia requested a waiver of the competitive need limitation (CNL) for products under the same statistical reporting number and the request was accepted for review, but the President did not grant a CNL waiver. In 2015, the PET Resin Coalition requested the removal of PET resin from India from GSP eligibility. The request was accepted for review, and the President granted the request. In 2018, the PET Resin Coalition petitioned to have Pakistan removed from the GSP eligibility for all PET resin products. USITC, *Generalized System of Preferences: Possible Modifications*, 2018 Review, USITC Publication 4972, September 2019.

<sup>1726</sup> USITC, *Polyethylene Terephthalate Resin from Canada, China, India, and Oman*, 2016.

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went into effect in 2017.<sup>1727</sup> In the final-phase investigations for those five countries, the determination was negative.<sup>1728</sup> However, at the time of the earlier preliminary duty orders, customers had to take into account actual or potential higher tariffs against various countries before ordering goods, so they were incentivized to find alternate suppliers. In comparing U.S. import shares in 2017 to 2018 for polyethylene terephthalate (PET) resin  $\geq 78$  ml/g, the five countries that had 2017 preliminary antidumping orders on imports of this product (Brazil, Indonesia, South Korea, Pakistan, and Taiwan) all saw a decrease in their share of U.S. imports in 2018, which likely corresponds to the increase in U.S. imports of this product from SSA.

## SSA Production and Increase in Plant Capacity

The increase in U.S. imports of PET resins from SSA is likely also driven in part by an increase in plant capacity for those products in South Africa. South Africa's main PET resin production plant is located in Durban and was significantly upgraded in 2017 to have a capacity of 240,000 metric tons per year. This capacity exceeds the South African domestic market's demand for PET, which leaves the opportunity to actively export into Europe, Asia, and the United States.<sup>1729</sup>

## Iron and Steel Waste and Scrap

This product group, iron and steel waste and scrap (ferrous scrap), includes ferrous waste and scrap, remelting scrap ingots of iron or steel, and slag, dross (other than granulated slag), scalings, and other waste from the manufacture of iron or steel.

## Overview of U.S. Imports

Total U.S. imports of ferrous scrap from the world increased 22 percent and were valued at \$2 billion in 2018, with Canada (65 percent) and Mexico (14 percent) as the top suppliers.<sup>1730</sup> U.S. imports of iron and steel waste and scrap from SSA countries increased from \$6,000 in 2016 to \$6 million in 2018 (table G.4). South Africa first exported to the U.S. market in 2018, capturing 0.3 percent in value of total U.S. imports of iron and steel waste from the world. This increase in imports from South Africa resulted in a large increase of 2,998.1 percent CAGR for imports of iron and steel waste and scrap from SSA.

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<sup>1727</sup> USITC, *Polyethylene Terephthalate Resin from Brazil, Indonesia, Korea, Pakistan, and Taiwan*, 2017.

<sup>1728</sup> USITC, *Polyethylene Terephthalate Resin from Brazil, Indonesia, Korea, Pakistan, and Taiwan*, 2018.

<sup>1729</sup> Safripol, Preferred Polymer Partner, n.d. (accessed October 22, 2019).

<sup>1730</sup> IHS Markit, Global Trade Atlas, U.S. imports under HS heading 2619 and 7204 (accessed October 22, 2019).

**Table G.4** Iron and steel waste and scrap: U.S. imports from SSA countries, 2016–18.

Product and Source Country	2016	2017	2018	Absolute Change 2016–18	Compound annual growth rate (CAGR)
					2016–18
		Millions \$			%
Iron and steel waste and scrap	( <sup>a</sup> )	( <sup>a</sup> )	6	6	2998.1
South Africa	0	0	6	6	( <sup>b</sup> )
Angola	( <sup>a</sup> )	0	0	( <sup>a</sup> )	( <sup>b</sup> )
Republic of the Congo	0	0	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>b</sup> )
Togo	0	( <sup>a</sup> )	0	0	( <sup>b</sup> )

Source: USITC DataWeb/USDOC (accessed September 5, 2019). All products are in digest MM023. Iron and steel waste and scrap enters under HTS statistical reporting numbers 7204.10.0000, 7204.21.0000, 7204.29.0000, 7204.30.0000, 7204.41.0020, 7204.41.0040, 7204.41.0060, 7204.41.0080, 7204.49.0020, 7204.49.0040, 7204.49.0060, 7204.49.0070, 7204.49.0080, 2619.00.3000 and 2619.00.9000.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Value less than \$500,000.

<sup>b</sup> Unable to calculate.

## Key Factors Affecting U.S. Imports, 2016–18

Ferrous scrap is a raw material input predominately used in an electric arc furnace to create crude (or molten) steel and eventually steel mill products.<sup>1731</sup> Therefore, the demand for steel mill products largely drives the demand for ferrous scrap. One key factor that affected U.S. imports during 2016–18 was an increase of steel production in the United States. During that time, U.S. steel production rose by 5.3 percent,<sup>1732</sup> which is in part driven by the section 232 tariffs the United States imposed on steel mill products—on March 8, 2018, the United States implemented the section 232 of the Trade Expansion Act of 1962, invoking tariffs on steel mill products in order to protect national security.<sup>1733</sup> After imposition of the tariffs, the capacity utilization of U.S. steel mill plants increased from approximately 74.0 percent at the beginning of the year to approximately 80.0 percent by year-end.<sup>1734</sup>

Meanwhile, the rising price of ferrous scrap<sup>1735</sup> in the United States likely contributed to the higher level of U.S. imports, including imports from nontraditional suppliers such as South Africa. The prices of

<sup>1731</sup> An electric arc furnaces is a squat, cylindrical vessel made of heavy steel plates. It has a dish-shaped refractory hearth and three vertical electrodes that reach down through a dome-shaped, removable roof. It uses high-current electric arcs to melt steel scrap and convert it into liquid steel of a specified chemical composition and temperature. Encyclopedia Britannica, “Electric-arc steelmaking” (accessed February 25, 2020).

<sup>1732</sup> Statista, “Steel Production Figures in the U.S. from 2006 to 2018” (accessed January 27, 2020).

<sup>1733</sup> Federal Register, *Imports of Steel Mill Articles (Steel Articles) Under Section 232 of the Trade Expansion Act of 1962, As Amended (19 U.S.C.1862), Presidential Proclamation 9705*, March 8, 2018, 83 FR 11625, March 15, 2018.

<sup>1734</sup> AISI, “Steel Mill Capacity Utilization Rate,” January 2018 and December 2018.

<sup>1735</sup> Prices for ferrous scrap grade No. 1 heavy melting rose from an average of \$204 per gross ton in 2016 to \$331 per gross ton in 2018.

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ferrous scrap grades No. 1 heavy melting, shredded scrap, and No. 1 busheling<sup>1736</sup> all rose in March 2018, peaked in July, and declined thereafter.<sup>1737</sup>

Though U.S. imports of ferrous scrap from SSA increased from 2016 to 2018, this trend is not likely to continue. Ferrous scrap prices for grades No. 1 heavy melting, shredded scrap, and No. 1 bushelings trended upwards during 2016–18 and declined in 2019.<sup>1738</sup> Moreover, according to Import Genius, the imported ferrous scrap from South Africa is attributable to one U.S. firm.<sup>1739</sup>

## Zinc and Related Articles

The products in this group include unwrought, not alloyed, zinc (“unwrought zinc”), zinc alloys, zinc waste and scrap, zinc dust and powders, and wrought zinc products such as bars, rods, and plates. In the United States, zinc is primarily used for the production of galvanized (zinc-coated) steel, which is used extensively in the automotive and construction industries.<sup>1740</sup>

## Overview of U.S. Imports

In 2018, the value of U.S. imports of zinc and related articles from SSA was \$6 million, an increase of almost \$6 million (1,038.2 percent CAGR) from a negligible amount of imports in 2016. The overall increase during that time period was almost entirely attributed to an increase in imports of unwrought zinc from South Africa (table G.5). The large percentage change in imports of unwrought zinc from South Africa reflects an increase from zero imports in 2016 to \$5 million in 2018. Prior to 2018, unwrought zinc had not been imported from South Africa since 2010. Despite the large percentage increase during 2016–18, SSA supplied a very small portion of total U.S. zinc imports from the world. In 2018, the total value of U.S. imports of zinc and related products was almost \$3 billion, and imports from SSA accounted for only about 0.2 percent.<sup>1741</sup> SSA countries are not known to be major suppliers or exporters of zinc and related articles.

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<sup>1736</sup> There are various grades of ferrous scrap. The World Steel Dynamics’ SteelBenchmarker tracks the prices of three grades: No. 1 heavy melting, No. 1 busheling, and shredded scrap. AMM defines the three grades tracked by SteelBenchmarker as follows: No. 1 heavy melting - Wrought iron and/or steel scrap 1/4 inch and over in thickness. Individual pieces not over 60 x 24 inches (charging box size) prepared in a manner to insure compact charging; No. 1 busheling - Clean steel scrap, not exceeding 12 inches in any dimensions, including new factory busheling (for example, sheet clippings, stampings, etc.). May not include old auto body and fender stock. Free of metal coated, limed, vitreous enameled, and electrical sheet containing over 0.5 percent silicon; and Shredded scrap - Homogeneous iron and steel scrap, magnetically separated, originating from automobiles, unprepared No. 1 and No. 2 steel, miscellaneous baling and sheet scrap. The average density is 50 pounds per cubic foot. AMM, *Glossary of Materials and Grades of Scrap*, <https://www.scrappricebulletin.com/glossary-of-prices> (accessed October 22, 2019).

<sup>1737</sup> World Steel Dynamics, *SteelBenchmarker* (accessed August 12, 2019).

<sup>1738</sup> World Steel Dynamics, *SteelBenchmarker* (accessed August 12, 2019).

<sup>1739</sup> Import Genius, *Imports of ferrous scrap from South Africa* (accessed September 17, 2019).

<sup>1740</sup> USGS, *2016 Minerals Yearbook: Zinc*, 2018.

<sup>1741</sup> USGS, “Mineral Commodity Summaries: Zinc,” 2019.

**Table G.5** Zinc and related articles: U.S. imports from SSA and South Africa, 2016–18

Product and source country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate
					2016–18
	Thousand \$				%
Zinc and related articles	40	80	5,551	5,512	1,083.2
Zinc not alloyed, unwrought	0	0	5,400	5,400	<sup>(a)</sup>
South Africa	0	0	5,400	5,400	<sup>(a)</sup>
Zinc bars, rods, profiles, wire	34	48	156	122	113.7
South Africa	34	48	156	122	113.7
All other products	5	8	0	0	<sup>(a)</sup>

Source: USITC DataWeb/USDOC (accessed September 18, 2019). All products are in digest MM040. Zinc, not alloyed, unwrought enters under HTS statistical reporting number 7901.11.0000. Zinc bars, rods, profiles and wire enters under HTS statistical reporting number 7904.00.0000, and Other refers to HTS statistical reporting numbers 7907.10.0000, 7907.20.0000, and 7907.60.0000.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Unable to calculate.

Although imports of zinc increased significantly, by percentage, during 2016–18, all of the imports went directly into bonded warehouses. Based on official trade data, none of the unwrought zinc that was imported from SSA during 2016–18 entered consumption channels in the United States. In 2018, all of the unwrought zinc from South Africa was imported duty free and entered bonded warehouses. These imports were most likely stored in warehouses in New Orleans, Louisiana, that were approved by the London Metal Exchange (LME), and were the only LME warehouses in the United States that had zinc inventories in 2018.<sup>1742</sup> According to official statistics, there were no imports for consumption of unwrought zinc from South Africa in 2018, so it is unlikely that the material held in bonded warehouses entered the U.S. consumption stream in that year.<sup>1743</sup> In fact, it is possible that some of this zinc will eventually be exported from the LME warehouses to other countries and not consumed domestically.

## Key Factors Affecting U.S. Imports, 2016-18

South Africa, the source of all of the reported unwrought zinc imports from SSA during 2016–18, does not have refined zinc production capacity and therefore is unlikely to be the producer of the zinc (see table G.6). Neighboring Namibia is the only SSA country that has refined zinc production capacity. During 2016–18, Scorpion Zinc (Pty) Ltd. in Namibia, a subsidiary of metals producer Vedanta Resources plc (United Kingdom), operated an open pit zinc mine and zinc refinery that produced Special High Grade (SHG) zinc metal for export to world markets.<sup>1744</sup> Skorpion's SHG zinc metal is registered for sale on the LME. Skorpion is a 100 percent export-oriented unit with about 22,000 to 39,000 short tons of its total production sold in the Africa region. It is possible that some of the unwrought zinc imported from South

<sup>1742</sup> The London Metal Exchange (LME) is the world center for the trading of industrial metals. The LME licenses and monitors a vast network of more than 550 approved warehouses in 34 locations across the globe. These warehouses are used to store LME-approved brands of metal, which themselves are used as the underlying assets for physically settled contracts traded on the Exchange. LME, "A Detailed Guide to the London Metal Exchange," May 20, 2018.

<sup>1743</sup> There were no imports for consumption of unwrought zinc from South Africa during the first seven months of 2019.

<sup>1744</sup> Chamber of Mines of Namibia, *2018 Annual Review*, 2019.

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Africa was produced at the Skorpion refinery in Namibia.<sup>1745</sup> While not a zinc producer, South Africa imports significant quantities of unwrought zinc metal. In 2018, South Africa imported \$60 million in unwrought zinc, with the majority of those imports coming from Brazil, Peru, and Namibia.<sup>1746</sup> It is possible that the U.S. imports from South Africa were produced in one or more of those countries.

**Table G.6** Refined zinc production in SSA countries, 2016–18

Product and country	2016	2017	2018	Absolute change	Compound annual	
				2016–18	growth rate (CAGR) 2016–18	
					%	
		Short tons				
Refined zinc	97,700	92,300	74,000	-24,000	-13.0	
South Africa	0	0	0	0	( <sup>a</sup> )	
Namibia	97,700	92,300	74,000	-24,000	-13.0	

Source: World Bureau of Metal Statistics, World Metal Statistics, June 2019.

Note: This table is based on the production of slab zinc by smelters and refineries, including production on toll in the reporting country, regardless of the type of source material, i.e., whether ores, concentrates, residues, slag or scrap. Remelted zinc and zinc dust are excluded. One short ton equals 2,000 pounds or 0.91 metric tons.

<sup>a</sup> Unable to calculate.

## Blank and Prerecorded Media

Blank and prerecorded media enables computers and other devices to store data for later processing and viewing or listening. Products include CDs and DVDs, hard disk drives, solid-state non-volatile storage devices (e.g., certain semiconductors), USB flash drives, memory cards, and other media for the recording of sound or of other phenomena.<sup>1747</sup>

## Overview of U.S. Imports

During 2016–18, U.S. imports of blank and prerecorded media products from SSA rose at a CAGR of 296.7 percent, increasing from \$2 million to \$29 million (table G.7). U.S. imports from Kenya grew from zero in 2016 and 2017, to \$22 million in 2018. U.S. imports from Cameroon also increased significantly, growing from a negligible amount in 2016, to \$5 million in 2018.

<sup>1745</sup> Vedanta Limited, “Consolidated Financial Statement—Form 20F,” July 14, 2019.

<sup>1746</sup> IHS Markit, Global Trade Atlas database (HS subheading 7901.11, accessed September 18, 2019).

<sup>1747</sup> USITC, *Harmonized Tariff Schedule of the United States (2018) Basic Edition*, XVI, 85–41. USB—an acronym for Universal Serial Bus—is an industry standard for cables, connectors and protocols for connection, communication and power supply between computers and peripheral devices.

**Table G.7** Blank and prerecorded media: U.S. imports from SSA and selected SSA countries, 2016–18

Product and source country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
		Thousand \$			%
Blank and prerecorded media	1,810	1,838	28,478	27,297	296.7
Kenya	0	0	22,054	22,053	( <sup>a</sup> )
Cabo Verde	64	396	95	890	22.1
Nigeria	0	27	34	34	( <sup>a</sup> )
Guinea	17	0	34	17	41.0
Cameroon	22	154	5,205	5	1,831,437.2
Mauritania	25	19	0	-25	( <sup>a</sup> )
South Africa	1,065	1,012	954	-111	-5.3
Madagascar	603	0	0	-603	( <sup>a</sup> )
All other SSA countries	14	230	102	88	171.0

Source: USITC DataWeb/USDOC (accessed September 5, 2019). All products are in digest EL004. Blank and prerecorded media enter under HTS statistical reporting numbers 8523.21.00, 8523.29.10, 8523.29.20, 8523.29.40, 8523.29.60, 8523.29.80, 8523.29.90, 8523.49.20, 8523.49.30, 8523.49.40, 8523.49.50, 8523.51.00, 8523.59.00, 8523.80.10, and 8523.80.20.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Unable to calculate.

Semiconductor media—solid-state non-volatile storage devices (SSDs)—increased 97.4 percent of the from SSA from 2016–18.<sup>1748</sup> Between 2016–18, U.S. imports of SSDs rose from \$1 million to \$27 million (a CAGR of 516.5 percent).<sup>1749</sup> Although the United States imported SSDs from nine SSA countries in 2018, Kenya and Cameroon were the two largest exporters of such products to the United States, accounting for \$22 million and \$5 million, respectively.<sup>1750</sup>

## Key Factors Affecting U.S. Imports, 2016–18

The increase in U.S. imports of blank and prerecorded media products from SSA was mainly driven by the increase of U.S. imports of SSDs. In recent years, U.S. consumer demand for SSDs has grown steadily as consumers have moved away from physical media and toward internet-based products and services,

<sup>1748</sup> A solid-state drive (SSD) is a type of semiconductor; it is a solid-state storage device that uses integrated circuit assemblies as memory to store data persistently, typically using nonvolatile memory. An SSD does not have any moving mechanical components (in contrast, hard drives and floppy disks have physical spinning disks and moveable read-write heads). Nonvolatile memory (also known as storage) retains data and program code without power. The main type of nonvolatile memory is flash, which itself is divided into NAND flash (96 percent) and NOR flash (4 percent). NAND flash appears in smartphones, personal computers, global positioning systems, and data centers. Mittal and Vetter, “A Survey of Software Techniques,” 2015. Semiconductor, solid-state nonvolatile storage devices are also known as NAND flash, NVRAM, NVMESSD, and other names. For ease of reference, this section calls them SSD.

<sup>1749</sup> The eight source markets, in descending order of import value, were Kenya, Cameroon, Cabo Verde, South Africa, Guinea, Côte d’Ivoire, The Gambia, Mauritius, and Eswatini. USITC DataWeb/USDOC, HS Heading 8523 (accessed August 12, 2019).

<sup>1750</sup> In 2018, SSDs accounted for all U.S. imports from Kenya, and over 99 percent of U.S. imports of blank and prerecorded media from Cameroon.

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such as circuit board-based and solid-state technologies.<sup>1751</sup> Consumers have been steadily substituting digital media and streaming services for DVDs and CDs.<sup>1752</sup> Similarly, businesses have been increasingly using cloud computing services and, in the process, reducing their need for physical storage and software.<sup>1753</sup> Price factors further contributed to the growth of U.S. SSD imports from Kenya and Cameroon.<sup>1754</sup> SSD prices rose for nine consecutive quarters until the final quarter of 2018.<sup>1755</sup> The increased value of U.S. imports of SSDs in 2016–18 reflected, in part, higher average selling prices. Additionally, despite the increase in average selling prices, the relative strength of the U.S. dollar increased purchasing power for SSDs.<sup>1756</sup>

The Semiconductor Industry Association reports that it is increasingly common for firms to locate more labor-intensive and less value-additive final assembly, testing, and packaging (ATP) operations in developing countries, where production and labor costs are lower.<sup>1757</sup> Most ATP operations are in Southeast Asia, but firms have been establishing new ones in South America, and one report notes the potential for African countries to enter this market given their competitive advantages, such as lower labor costs.<sup>1758</sup> However, industry representatives were unable to verify that the increase in U.S. imports of blank and prerecorded media were due to increased production capacity or the establishment of new production facilities in Kenya, Cameroon, or other SSA countries.<sup>1759</sup>

## Fastest-growing U.S. Imports for Consumption under AGOA, in Percentage Change Terms, 2016–18

In terms of percentage change in U.S. imports under AGOA from SSA, the largest increase was in canned fish products—primarily preserved tuna from Senegal, Mauritius, Cabo Verde, and Côte d’Ivoire (table G.8 and table G.9).<sup>1760</sup> U.S. consumption of canned tuna products remained stable during 2016–18, but U.S. production declined slightly, resulting in an increase in the quantity of tuna imported).

<sup>1751</sup> Absent SSDs, U.S. imports of blank and prerecorded media from SSA would have declined by 8.7 percent from 2016–18.

<sup>1752</sup> Some services, such as YouTube, are free.

<sup>1753</sup> Moreover, many software companies now offer their products via internet download and release upgrades and updates through the internet.

<sup>1754</sup> U.S. imports of SSDs also grew from other source markets. From 2016 to 2018, U.S. imports of SSDs from all countries increased at a CAGR of 21.3 percent. IHS Markit, Global Trade Atlas database (accessed September 12, 2019).

<sup>1755</sup> SSDs and other memory chips tend to be commodity-like in their sales characteristics; prices change daily on the spot market, and contract prices are generally renegotiated twice per month. Wells Fargo, *Semiconductor Industry Primer*, September 15, 2017, 16.

<sup>1756</sup> IBISWorld, *Semiconductor and Circuit Manufacturing in the U.S.*, 2019, 7.

<sup>1757</sup> A typical SSD crosses international borders four or more times during its production. Semiconductor Industry Association, *Semiconductors and the Future of the Harmonized System*, May 2019, 1.

<sup>1758</sup> Semiconductor Industry Association, *Beyond Borders*, 2016, 13.

<sup>1759</sup> Industry representatives, telephone interview by USITC staff, August 15, 2019.

<sup>1760</sup> USITC DataWeb/USDOC (accessed July 2, 2019). Data are for USITC digest AG007.

In terms of SSA countries from which U.S. imports of goods have increased the most, Nigeria ranked at the top in terms of growth in import value from 2016–18 (table 3.5). The growth was primarily due to an increase in value of crude petroleum and petroleum products imported from Nigeria. However, in terms of percentage change, Zambia was the leader, growing by nearly 600 percent from \$2 million in 2016 to \$89 million in 2018. Zambia’s largest export product group—by value in 2018 and in terms of percentage change in 2016–18—was copper and related articles, which accounted for 97.6 percent of total U.S. imports under AGOA from Zambia.

**Table G.8** U.S. imports for consumption under AGOA, by leading growth product, in percentage change terms 2016–18

Product	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
	Million \$				2016–18
					%
Total	10,444	13,650	12,100	1,657	7.6
Canned fish	1	6	35	35	632.8
All other products	10,443	13,644	12,063	1,621	7.5

Source: USITC DataWeb/USDOC (accessed July 9, 2019).

Note: Due to rounding, figures may not add up to totals shown.

## Canned Fish

The prepared fish category includes prepared and preserved (e.g., canned or breaded) fish of all species, including sardines, salmon, and tuna. It also includes processed fish products such as frozen fish sticks. By U.S. import value, the primary commodity in this group is canned tuna.

### Overview of U.S. Imports

The value of prepared fish imports from SSA under AGOA increased from \$1 million in 2016 to \$35 million in 2018, which is a 632.8 percent CAGR (table G.9). Of this total, over 99 percent was preserved tuna. Imports under AGOA from Senegal were mostly of consumer-ready, packaged tuna products. In 2018, the value of AGOA canned tuna imports from Senegal rose sharply due to increased production at a plant there, as described below. During the 2016–18 period, AGOA imports from SSA increased in value due primarily to the emergence of Senegal as a canned tuna supplier to the U.S. market.

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**Table G.9** Prepared fish: U.S. imports from SSA under AGOA, 2016–18

Country	2016	2017	2018	Absolute change	Compound annual
				2016–18	growth rate (CAGR)
					2016–18
			Million \$		%
Prepared fish	1	6	35	35	632.8
Senegal	0	5	32	32	<sup>(b)</sup>
Mauritius	0	0	1	1	<sup>(b)</sup>
Côte d'Ivoire	<sup>(a)</sup>	0	1	1	192.0
Cabo Verde	1	1	1	<sup>(a)</sup>	19.5
South Africa	0	0	<sup>(a)</sup>	<sup>(a)</sup>	<sup>(b)</sup>
Ghana	0	0	<sup>(a)</sup>	<sup>(a)</sup>	<sup>(b)</sup>
Tanzania	0	<sup>(a)</sup>	<sup>(a)</sup>	<sup>(a)</sup>	<sup>(b)</sup>
All other SSA	0	0	0	0	<sup>(b)</sup>

Source: USITC DataWeb/USDOC (accessed September 5, 2019). All products are in digest AG007. Prepared fish enters under HTS statistical reporting numbers 1604.14.10, 1604.14.40, 1604.13.90, 1604.14.30, 1604.12.60, 1604.14.50, 1604.15.00, 1604.13.20, 1604.13.40, 1604.19.51, and 1604.19.22. Prepared and preserved tuna products are classified in HTS statistical reporting number 1604.14.

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

<sup>b</sup> Unable to calculate.

## Key Factors Affecting U.S. Imports, 2016–18

Imports of canned tuna from SSA grew during 2016–18. During this period, imports accounted for an increasing share of U.S. canned tuna consumption, which has been slowly declining on a per capita basis since 2003.<sup>1761</sup> Data are not available for 2018, but between 2016 and 2017, U.S. consumption of canned tuna was stable, while U.S. production declined slightly.<sup>1762</sup> This led to an increase in the value of U.S. imports, from \$819 million in 2016 to around \$1 billion in 2018 (a 22 percent increase). The quantity imported rose by a similar percentage.<sup>1763</sup>

The main contributor to the increase in canned tuna imports from SSA under AGOA was the entrance of Senegal as a supplier of canned tuna. StarKist, a U.S.-headquartered and South Korean-owned firm, bought a tuna processing plant in Senegal in 2011.<sup>1764</sup> However, the plant was not profitable at first and took time to ramp up production.<sup>1765</sup> StarKist reportedly considered closing the plant in 2016, but instead made improvements and, in 2018, production levels were triple what they had been in 2011.<sup>1766</sup> Between 2013 and 2016, shipments of canned tuna from Senegal were primarily to the European Union (France), but starting in 2017, shipments to the United States exceeded shipments to France. By 2018, the United States was by far the largest destination for Senegal's canned tuna exports.<sup>1767</sup>

Between 2016 and 2018, the European Union increased its imports of canned tuna from several countries, most notably Ecuador, at the expense of imports from Senegal. Increased imports from

<sup>1761</sup> NOAA, *Fisheries of the United States 2016*, September 2017, 118.

<sup>1762</sup> NOAA, *Fisheries of the United States 2017*, September 2018, 106 and 116.

<sup>1763</sup> USITC DataWeb/USDOC, data for U.S. imports for consumption of HTS 1604.14 (accessed September 25, 2019).

<sup>1764</sup> Undercurrent News, "Dongwon's Senegalese Tuna Plant Posts First Profit," April 30, 2018.

<sup>1765</sup> Undercurrent News, "Dongwon's Senegalese Tuna Plant Posts First Profit," April 30, 2018.

<sup>1766</sup> Undercurrent News, "Dongwon's Senegalese Tuna Plant Posts First Profit," April 30, 2018.

<sup>1767</sup> IHS Markit, Global Trade Atlas database, HS subheading 1604.14 (accessed September 25, 2019).

Ecuador were due to the implementation of the EU-Andean Community trade agreement. Under the terms of this agreement, EU tariffs on canned tuna from Ecuador were cut from 24 percent to zero on January 1, 2017.<sup>1768</sup> As a result, EU imports of canned tuna rose from \$474 million in 2016 to \$734 million in 2018.<sup>1769</sup> This duty-free access for tuna from Ecuador likely reduced the competitiveness of Senegalese canned tuna in the EU market, and the StarKist facility there began to ship to other markets such as the United States. AGOA preferences help make the United States an attractive market for Senegal's tuna exports; nearly all U.S. imports of canned tuna from Senegal received such benefits in 2017 and 2018. The canned tuna industry features a few large companies with global supply chains (including StarKist), and small differences in price can heavily affect the companies' sourcing decisions.<sup>1770</sup> Because U.S. canned tuna imports mostly face the over-quota tariff rate of 12.5 percent, preferential tariff rates such as those available to Senegal under AGOA are an important factor influencing canned tuna imports.

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<sup>1768</sup> European Community, "Countries and Regions: Andean Community," <https://ec.europa.eu/trade/policy/countries-and-regions/regions/andean-community/> (accessed October 23, 2019).

<sup>1769</sup> IHS Markit, Global Trade Atlas database, HS statistical reporting number 1604.14 (accessed October 23, 2019).

<sup>1770</sup> USITC, *AGOA: Trade and Investment Performance Review*, 2014.

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## **Appendix H**

# **Internet Connectivity in SSA**

## Overview of Internet Connectivity

Internet connectivity is a key enabler of the digital economy, both globally and in sub-Saharan Africa (SSA). Over the past decade, a growing number of people in SSA have been able to access and use the internet for the first time. During 2012–17, for example, the number of people in SSA using the internet grew at an average annual rate of 20.2 percent, from 85 million to 213 million.<sup>1771</sup> However, this access varied widely by country (table H.1). For a variety of reasons, access to the internet is severely limited in SSA: fixed-line broadband service is limited to less than 1 percent of the population, whereas access via mobile devices stands at roughly 25 percent.

**Table H.1** ICT connectivity, by country, 2017

Country	% of population using the internet	% of households with a computer	Mobile phone subscriptions per 100 people	% of mobile phone with access to internet	% of mobile phones with 3G/4G <sup>a</sup>	Avg mobile download speed (Mbps) <sup>b</sup>	Fixed broadband subscriptions per 100 people
Nigeria	42.0	24.2	75.9	51.0	50	4.13	0.06
South Africa	56.2	45.3	155.2	68.4	65	9.93	1.97
Kenya	17.8	10.7	85.3	49.8	43	6.75	0.57
Ghana	39.0	27.7	126.2	41.0	62	4.81	0.20
Ethiopia	18.6	n.a.	37.2	n.a.	79	n.a.	0.06
Rwanda	21.8	n.a.	73.6	n.a.	23	n.a.	0.18
Côte d'Ivoire	43.8	18.8	129.9	40.4	57	7.64	0.58

Source: World Bank, World Development Indicators, “Individuals Using the Internet (% of Population)” (accessed November 18, 2019); World Bank, World Development Indicators, “Mobile Cellular Subscriptions (per 100 People)” (accessed November 18, 2019); ITU, “Statistics” (accessed September 19, 2019); Open Signal, “Global State of Mobile Networks (Overall Download Speed Comparison),” February 2017; Afrobarometer, “R7 2016/2018—Own Computer?” (accessed November 19, 2019); Afrobarometer, “R7 2016/2018—Mobile Phone Has Access to Internet?” (accessed November 19, 2019); GSMA, “% Mobile Broadband” (accessed November 19, 2019).

Note: n.a. = data unavailable.

<sup>a</sup> Data is for 2018. 3G is an acronym for “third generation” (of mobile telecommunications technologies), whereas 4G is an acronym for “fourth generation.” Each subsequent generation of installed telecommunications technologies facilitates faster data transfer speeds.

<sup>b</sup> Mbps is an acronym for “megabits per second.”

Although roughly half of the mobile phone users in SSA currently use flip phones, the adoption of feature phones and 3G-enabled smartphones has grown dramatically over the past few years.<sup>1772</sup> For example, the number of active mobile-broadband subscriptions in Africa as a whole—an indicator of feature phone and smartphone adoption—grew at a compound annual growth rate of 35.2 percent

<sup>1771</sup> ITU, “Statistics” (accessed September 19, 2019).

<sup>1772</sup> Feature phones, which emerged in the late 1990s, offer a fixed set of functions beyond standard voice and text messaging services, typically email and (highly limited) internet access; feature phones typically lack standard smartphone functionality like the ability to download apps. For more information on feature phones, see box 7.1 in chapter 7. PCMag, “Definition of: Feature Phone,” <https://www.pcmag.com/encyclopedia/term/62894/feature-phone> (accessed September 18, 2019). 3G, an acronym for “third generation,” is a set of telecommunications standards and technologies that offer higher data transfer speeds (up to 2 megabits per second) than previous second generation (2G) standards. 3G technologies allowed widespread access to mobile internet services, whereas 2G technologies were capable of offering only voice and text messaging services. 4G (fourth generation) offers even higher data transfer speeds. For more on generations of mobile networks, see USITC, *Global Digital Trade 1: Market Opportunities*, August 2017, 45–46.

from 51 million in 2012 to 312 million in 2018, representing around 30 percent of the regional population and 40 percent of the mobile phone connection base (744 million subscribers).<sup>1773</sup> In just the past two years, the adoption of 3G-enabled smartphones doubled in SSA, due not only to the emergence of inexpensive smartphones but also to ongoing 3G network expansion. Indeed, networks offering mobile broadband services over 3G and (to a much lesser extent) 4G technologies now cover more than 80 percent of the population in SSA,<sup>1774</sup> although coverage can vary dramatically by country. In 2017, for example, more than 90 percent of the population was covered by at least a 3G signal in Cabo Verde, Gabon, Lesotho, Rwanda, and South Africa, whereas only 24–27 percent of the population was covered in Chad, Niger, and Mali.<sup>1775</sup>

Despite the current dominance of 4G technologies in many parts of the world, 3G networks are set to become the main source of mobile broadband services in SSA for the foreseeable future, as regional telecommunications operators focus on not only upgrading existing networks but also expanding network coverage using 3G technologies. Overall, telecom carriers in the region are focusing on 3G technologies—as opposed to higher-bandwidth 4G technologies—because 3G networks can support both basic services (voice and text) for flip phones and feature phones as well as data and internet services for smartphones. Spectrum availability is also a factor: operators are choosing to reuse existing 900 megahertz (MHz) spectrum to offer broadband services over 3G, rather than waiting for auctions to release the spectrum necessary to launch 4G services.<sup>1776</sup> Nonetheless, 4G networks are popping up in select locations; in 2018 about 343 million people in Africa as a whole had access to a network with 4G speed.<sup>1777</sup>

SSA relies on a series of fiber-optic undersea cables to connect to the global internet.<sup>1778</sup> Until 2009, SSA was served by a single, older-generation cable that ran down the west coast of Africa. During this period, satellite services—which are relatively slow, unreliable, and expensive—were SSA’s only other source of international internet connectivity. During 2007–12, however, more than \$3 billion flowed into the construction of seven undersea cables, which were activated in succession over the next four years. The West Africa Cable System, for example, runs along a route from South Africa to the United Kingdom, with 12 landing stations providing global internet connectivity to Africa’s west coast.<sup>1779</sup> On the eastern coast, the SEACOM system connects South Africa, Mozambique, Tanzania, Kenya, Ethiopia, Uganda, and Rwanda to France and India.<sup>1780</sup> More recently, the South Atlantic Cable System (SACS), a 616,000-

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<sup>1773</sup> The ITU’s data do not include Comoros, Djibouti, Mauritania, Somalia, or Sudan.

<sup>1774</sup> GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2018, 9.

<sup>1775</sup> ITU, *World Telecommunications/ICT Indicators Database*, 2018.

<sup>1776</sup> Including LTE and Wimax networks. Additionally, about 3 percent of SSA had access to a 5G network. ITU, *World Telecommunications/ICT Indicators Database* (accessed January 22, 2020); GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2019, 14.

<sup>1777</sup> GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2018, 13.

<sup>1778</sup> Undersea cables—which consist of several strands of fiber-optic cable surrounded by multiple layers of protective shielding and a rubber coating—are laid on the ocean floor, stretching between countries’ coastal landing stations, which serve as interconnection points for domestic, land-based networks. Undersea cables are a critical part of the global internet infrastructure, transmitting more than 99 percent of international voice and data traffic. Griffiths, “The Global Internet Is Powered by Vast Undersea Cables,” July 26, 2019.

<sup>1779</sup> Akwei, “Submarine Cable Deployed in Angola to Link Africa to South America,” August 10, 2017.

<sup>1780</sup> Tshabala, “In Just 5 Years, Submarine Cables Have Brought a 20-Fold Increase,” June 4, 2015.

kilometer cable constructed across the Atlantic Ocean between Angola and Brazil, entered service in October 2018.<sup>1781</sup> In June 2019, Google announced plans to build an undersea cable, named Equiano, between Portugal and South Africa.<sup>1782</sup>

Spurred by the landing of multiple undersea cables, most countries in SSA started constructing fiber-optic terrestrial networks connecting their cable landing station to important towns and cities. In Uganda, for example, the government has installed more than 1,500 kilometers of fiber-optic cable connecting more than 20 cities and towns.<sup>1783</sup> A pan-African fiber-optic network has also emerged over the past few years: Liquid Telecom, a telecom company based in Mauritius, has constructed a 70,000-kilometer land-based network that runs from Cape Town, South Africa, to Cairo, Egypt.<sup>1784</sup>

Despite such large-scale infrastructure construction, many SSA countries continue to be characterized by an underdeveloped landline network, particularly in rural areas. Historically, the geographic deployment of fixed-line networks was hampered by the effort and expense of network construction, which involved digging trenches and laying copper and/or fiber-optic cabling along roads, train tracks, and other rights-of-way. Indeed, by 2018, the number of fixed-telephone subscriptions—an indicator of fixed-line infrastructure development—stood at only 8.7 million, or roughly 1 percent of the population of SSA.<sup>1785</sup>

As a result, many SSA countries lack regional and local networks connecting small towns to national backbone networks as well as the so-called “last mile” links connecting individual homes and businesses to the broader telecom network, a factor that has severely limited the deployment of fixed-broadband services. In 2018, for example, there were slightly more than 4 million fixed broadband subscribers in all of sub-Saharan Africa, or less than 1 percent of the population.<sup>1786</sup> As a result, smartphones (and feature phones) are the primary (or only) means by which the vast majority of the general population in SSA accesses the internet (see box 7.1 in chapter 7).

## Barriers to Internet Access in SSA

Overall, internet access is severely limited in many SSA countries, with estimates of internet usage penetration among the general population ranging between 1.2 percent in Eritrea and 57 percent in the Seychelles in 2016. During that same year, internet penetration in SSA as a whole stood at roughly 22 percent.<sup>1787</sup> There are two main reasons for such low internet usage: underdeveloped network facilities and the high cost of internet services and devices.

First, as mentioned above, many SSA countries are characterized by underdeveloped land-based networks, including national “backbone” networks, networks connecting rural areas to the backbone,

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<sup>1781</sup> NEC, “The South Atlantic Cable System Ready for Service,” October 1, 2018.

<sup>1782</sup> Moscaritolo, “Google Reveals ‘Equiano’ Subsea Cable Project,” June 28, 2019.

<sup>1783</sup> NITA-U, “National Backbone Infrastructure Project,” n.d. (accessed September 23, 2019).

<sup>1784</sup> Liquid Telecom, “Our network” (accessed September 23, 2019).

<sup>1785</sup> ITU, “Statistics” (accessed January 22, 2020).

<sup>1786</sup> ITU, “Statistics” (accessed January 22, 2020). Computer ownership was also a factor. In 2018, only 9.6 percent of the households in SSA owned a computer.

<sup>1787</sup> 2016 is the latest year for which comprehensive data were available. ITU, *World Telecommunications/ICT Indicators Database, 2018*; ITU, “Statistics” (accessed September 19, 2019).

and even “last mile” networks connecting individual homes and businesses (in both urban and rural areas). In many countries, too, mobile network coverage is patchy, particularly in rural areas.

Second, cost affects the ability of the average African to purchase mobile phones and pay for internet access services. In terms of fixed-line access, only 9.6 percent of households in Africa as a whole owned a computer in 2017,<sup>1788</sup> while the cost of a standard broadband internet connection represented 64 percent of the average income, an important barrier to the broad-based adoption of internet usage.<sup>1789</sup> In 2017, the total cost of mobile ownership—which includes the cost of a mobile handset, activation charge, and 500 megabits of data per month—represented 10 percent of the average income in SSA, well above the threshold of 5 percent recommended by the United Nations Broadband Commission.<sup>1790</sup> Going forward, growth in internet access in SSA will be driven by the availability of entry-level devices at affordable prices, typically phones that are priced at less than \$100. Samsung (South Korea) is the leading seller of low-cost smartphones in SSA, although Chinese companies like Transsion Holdings, which sells phones under the Tecno brand name, are moving into the SSA smartphone market.<sup>1791</sup> A growing number of first-time smartphone users also rely on second-hand phones that are either passed down by relatives or purchased in the growing secondary market for recycled smartphones.<sup>1792</sup>

Unreliable power supply issues also represent an important barrier to internet access in some countries. In regions that suffer from frequent power outages, for example, telecom carriers are often required to set up generators to power cellular transmission towers, adding to the difficulty (and costs) of operating mobile networks in some areas.<sup>1793</sup> Having an unreliable power infrastructure can also cause downstream problems. In some countries, power-supply issues have forced technology firms to set up diesel generators to power offices and servers, activities which limit their ability to provide 24-hour support due to the high costs of running generators for extended periods of time.<sup>1794</sup> Indeed, according to one survey, 57 percent of technology startups in Nigeria listed a lack of electricity as a major obstacle to their operations.<sup>1795</sup> An unreliable electricity grid also affects consumers, who often have to pay higher prices to charge their mobile phones. For example, the average cost to charge a mobile phone at a kiosk in Africa ranged from \$30 to \$50 per kilowatt hour,<sup>1796</sup> a price level that is unaffordable to much of the general population.

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<sup>1788</sup> ITU, “Statistics” (accessed September 19, 2019).

<sup>1789</sup> UbuntuNet Alliance, “ITU Is Worried about High Cost of Broadband,” 2016.

<sup>1790</sup> GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2018, 29.

<sup>1791</sup> GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2018, 11.

<sup>1792</sup> GSMA, *The Mobile Economy: Sub-Saharan Africa*, 2017, 12.

<sup>1793</sup> GSMA, “Tower Power Africa,” November 26, 2014.

<sup>1794</sup> McDonnell, “The Powerlessness of Nigeria’s Tech Startups,” November 24, 2019.

<sup>1795</sup> Power outages affect all sectors in SSA, not just firms in the digital economy. Ramachandran et al., “The New Economy of Africa,” November 12, 2019, 19.

<sup>1796</sup> Statista, “Average Electricity Prices in Africa,” 2016; BloombergNEF, “Offgrid Solar Market Trends Report 2016,” February 2016. Overall, in 2016, the average costs of grid electricity in SSA ranged from \$24.40 per megawatt hour (MWh) in Ethiopia to \$306.34 per MWh in Ghana.



# **Appendix I**

## **Additional Tables Corresponding to Figures in the Report**

**Table I.1** Air transport services: U.S. exports to Africa 2016–18, by category (million \$)

	2016	2017	2018
<b>Total</b>			
Africa	1210	1303	1374
Nigeria	312	323	
South Africa	377	427	426
<b>Passenger</b>			
Africa	856	925	982
Nigeria	280	286	283
South Africa	298	343	336
<b>Freight</b>			
Africa	203	223	245
Nigeria	20	24	30
South Africa	55	60	64
<b>Port</b>			
Africa	151	155	147
Nigeria	11	12	13
South Africa	24	24	25

Source: USDOC, BEA, International Services Tables, table 2.2 (accessed August 8, 2019).

Note: Due to rounding, figures may not add up to totals shown. Corresponds to figure 2.1.

**Table I.2** Number of enrolled students from selected SSA countries by academic year, 2016–19

Place of Origin	2016/17	2017/18	2018/19
Ethiopia	1,847	2,118	2,061
Kenya	3,189	3,322	3,451
Rwanda	1,088	1,232	1,292
South Africa	1,911	2,040	2,042
Côte d'Ivoire	1,353	1,349	1,392
Ghana	3,111	3,213	3,661
Nigeria	11,710	12,693	13,423
All other SSA	13,526	13,512	12,968

Source: International Institute of Education. IIE, "International Students by Place of Origin, 2016/2017 and 2017/2018" (accessed November 14, 2019); IIE, "International Students by Place of Origin, 2015/16 & 2016/17," 2017 (accessed February 5, 2020).

Note: Due to rounding, figures may not add up to totals shown. Corresponds to figure 2.2.

**Table I.3** World imports of air transportation services from select SSA countries, 2016–18 (million \$)

Country	Sector	2016	2017	2018
Africa	Air transport	9372	10404	11642
	Passenger (Air)	6766	7619	8573
	Freight (Air)	*	*	1204
	Other (Air)	1701	1787	1866
Ethiopia	Air transport	2175	2576	3230
	Passenger (Air)	1791	2069	*
	Freight (Air)	296	385	*
	Other (Air)	88	122	*
Ghana	Air transport	203	122	*
	Passenger (Air)	106	69	*
	Freight (Air)	97	53	*
	Other (Air)	*	*	*
Kenya	Air transport	830	828	*
	Passenger (Air)	648	648	*
	Freight (Air)	71	74	*
	Other (Air)	111	106	*
Nigeria	Air transport	36	72	*
	Passenger (Air)	18	60	*
	Freight (Air)	18	12	*
	Other (Air)	0	0	*
Rwanda	Air transport	80	183	*
	Passenger (Air)	77	175	*
	Freight (Air)	4	8	*
	Other (Air)	*	*	*

Source: WTO, Statistics Database, Time Series on International Trade, "Trade in Commercial Services, 2005–onward" (accessed September 23, 2019).

Note: Data for Ghana, Kenya, Nigeria, and Rwanda were not available for 2018. \* = not available. Corresponds to figure 3.1.

**Table I.4** U.S. greenfield FDI projects and M&A deals by destination, 2016–18

Country	Greenfield (million \$)	M&A (million \$)	Total FDI (million \$)	Share of total FDI deals (%)
South Africa	117	62	179	49.9
Kenya	26	26	52	14.5
Nigeria	26	23	49	13.6
Ghana	10	8	18	5.0
Liberia	10	1	11	3.1
Uganda	3	6	9	2.5
Côte d'Ivoire	0	6	6	1.7
All others	17	18	35	9.7
Ethiopia	0	6	6	1.7
Rwanda	1	3	4	1.1
Mauritius	1	3	4	1.1
Seychelles	3	0	3	0.8
Namibia	1	2	3	0.8
Lesotho	2	0	2	0.6
United Republic of Tanzania	2	0	2	0.6
Senegal	1	1	2	0.6
Botswana	1	1	2	0.6
Zambia	1	1	2	0.6
Madagascar	1	1	2	0.6
Cameroon	1	0	1	0.3
Equatorial Guinea	1	0	1	0.3
Guinea-Bissau	1	0	1	0.3
<b>Total</b>	<b>209</b>	<b>150</b>	<b>359</b>	<b>100.0</b>

Source: Financial Times, fDiMarkets database; Bureau van Dijk, Zephyr database.

Note: Corresponds to figure 4.1.

**Table I.5** Agricultural output value by region, 2014–16 (billion \$)

Year	Middle Africa	Southern Africa	Eastern Africa	Western Africa
2006	5,221	12,958	27,903	89,784
2007	5,534	13,336	28,713	84,780
2008	5,787	15,027	29,856	92,252
2009	6,180	14,859	31,823	84,418
2010	6,674	15,019	35,323	94,347
2011	6,869	14,969	35,678	89,186
2012	7,134	15,475	36,933	96,876
2013	7,275	15,798	38,164	96,729
2014	7,443	16,100	38,407	105,761
2015	7,774	15,763	38,470	107,629
2016	8,228	15,209	37,708	108,464

Source: FAO, FAOSTAT Statistical Database (accessed November 27, 2019).

Note: Agricultural output is defined as the Agriculture Production Index Number, calculated by FAO. Detailed information on the calculation methodology can be found at [http://fenixservices.fao.org/faostat/static/documents/QI/QI\\_e.pdf](http://fenixservices.fao.org/faostat/static/documents/QI/QI_e.pdf). Corresponds to figure 6.1.

**Table I.6** SSA production trends for selected crops, marketing years 2006/2007–2018/19 (million metric tons)

Commodity	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	2014/ 2015	2015/ 2016	2016/ 2017	2017/ 2018	2018/ 2019
Corn/maize	42148	47488	48774	53189	56745	62049	62745	65806	67639	63836	75025	76337	74266
Cocoa	1607	1557	1563	1353	1294	1703	1832	1687	1852	1772	1861	2196	2378
Cotton	1266	1011	1036	934	953	1387	1404	1389	1507	1239	1514	1664	1710

Source: FAO, "FAOSTAT Statistical Database" (accessed November 27, 2019).

Note: Production statistics for cotton and maize are based on 2018/19 marketing year estimates from the Production, Supply, and Distribution (PSD) database, Foreign Agricultural Service, USDA. Cocoa production is an estimate based on mirrored export statistics of Ghana and Côte d'Ivoire. IHS Markit, Global Trade Atlas database (accessed November 26, 2019). Corresponds to figure 6.2.

**Table I.7** SSA imports of telecommunications, computer, and information services by key market (million \$), 2012–17

Country	2012	2013	2014	2015	2016	2017
<b>Total SSA imports from the world</b>						
Côte d'Ivoire	n.a.	93	101	96	194	230
Ethiopia	164	178	149	201	224	91
Kenya	13	13	59	74	29	38
Nigeria	549	853	1530	1069	346	440
Rwanda	22	8	23	12	12	15
South Africa	906	1017	1049	1048	1114	1203
Total	1751	2162	2911	2500	1918	2015
<b>SSA Imports from the United States</b>						
Nigeria	125	122	121	113	107	111
South Africa	257	252	247	246	207	219
Africa	788	799	741	670	612	636

Source: WTO, Time Series on International Trade, "Trade in Commercial Services, 2005–onward (BOP6)" (accessed August 12, 2019); USDOC, BEA, International Services Tables, table 4.4 (accessed January 22, 2020).

Notes: Data for 2018 are unavailable for total SSA imports. Data for Ghana are unavailable for total imports. Data for Côte d'Ivoire for total SSA imports are unavailable for 2012. Data for imports from the United States are only available for Nigeria and South Africa. Corresponds to figure 7.1.

**Table I.8** U.S. greenfield investment in communications, software, and information technology services in SSA by market, cumulative 2016–18

Country	U.S. greenfield investment (million \$)	% of total
Madagascar	94.1	3
Mauritius	99.3	3
Uganda	295.4	10
Nigeria	945.8	32
South Africa	1350.5	46
All other	168.4	6
Total	2953.5	100

Source: *Financial Times*, fDi Markets database (accessed November 18, 2019).

Notes: fDi Markets tracks announcements of new capital investment, though this data may reflect the intentions of firms rather than completed investments. It also provides information only on greenfield investment and joint ventures that lead to a new physical operation.

FAO, "Methodology and scope of the data" <http://www.fao.org/economic/est/issues/investment/trends/methodology-data/en/#.XiidOMg3nct> (accessed November 29, 2019). Corresponds to figure 7.2.

**Table I.9** Worldwide cloud traffic by region, 2017

Worldwide cloud traffic by region, 2017	Exabytes	%
North America	3,514	43

<b>Worldwide cloud traffic by region, 2017</b>	<b>Exabytes</b>	<b>%</b>
Asia Pacific	2,527	31
Western Europe	1,386	17
Central and Eastern Europe	270	3
Latin America	300	4
Middle East and Africa	194	2
<b>Total</b>	<b>8,191</b>	<b>100</b>

Source: Cisco, "Global Cloud Index," 2018.

Note: Corresponds to figure 7.3.

**Table I.10** Average fixed latency, by country, 2017 (milliseconds)

<b>Country/region</b>	<b>Average fixed latency (milliseconds)</b>
Middle East and Africa	52
Ethiopia	41
Kenya	43
South Africa	44
Ghana	62
Nigeria	84
Rwanda	63

Source: Cisco, "Global Cloud Index," 2018; Cisco, "Cloud Readiness Tool," 2018. <https://www.cisco.com/c/en/us/solutions/service-provider/cloud-readiness-tool/index.html> (accessed August 13, 2019).

Note: The Africa and SSA regions are not broken out discretely in the underlying data. Country-level data are not available for Rwanda and Côte d'Ivoire. Corresponds to figure 7.4.

**Table I.11** Estimated e-commerce market value by region, 2019 (billion dollars)

<b>Region</b>	<b>Market value</b>
Asia	831.7
North America	552.6
Europe	346.5
Australia	18.6
Africa and Middle East	18.6
South America	17.7

Source: ShopifyPlus, "Global E-commerce Statistics," February 14, 2019.

Note: The Africa and SSA regions are not broken out discretely in the underlying data. Corresponds to figure 7.5.

**Table I.12** Table I.12 United Nations Conference on Trade and Development (UNCTAD), e-commerce index values, 2017

<b>Country/Region</b>	<b>Index value</b>
Africa	30
Developed	86
World	55
Nigeria	55
South Africa	53
United States	91

Source UNCTAD, B2C E-commerce Index 2018, 2018.

Note: Corresponds to figure 7.6.

**Table I.13** YouTube monthly active users in Nigeria and South Africa, 2015–20

Year	Nigeria	South Africa
2015	33.5	18.2
2016	36.6	19.5
2017	39.7	20
2018	42.6	20.3
2019	45.1	20.4
2020	47.7	20.2

Source: Fusion Nakano Database, “YouTube Monthly Active Users by Year” (accessed October 25, 2019).

Note: The values for 2019 are estimates and the values for 2020 values are forecasts. Corresponds to figure 7.7.

**Table I.14** YouTube revenues (million \$) in Nigeria and South Africa, 2015–20

Year	Nigeria	South Africa
2015	44.7	170.1
2016	60	222
2017	74.5	265
2018	88.2	297
2019	100.6	321
2020	111.8	337

Source: Fusion Nakano Database, “YouTube Revenue by Year” (accessed October 25, 2019).

Note: The values for 2019 are estimates and the values for 2020 values are forecasts. Corresponds to figure 7.8.

**Table I.15** Netflix: Number of subscribers and revenue (million \$), South Africa, 2016–20

Year	Subscribers (thousands)	Revenues (million \$)
2016	44.4	2.8
2017	90	7
2018	152.6	12.9
2019	232.7	20.9
2020	338	31.5

Source: Fusion Nakano Database, “Netflix Subscribers by Year”: “Revenue by Year” (accessed October 25, 2019).

Note: The values for 2019 are estimates and the values for 2020 values are forecasts. Corresponds to figure 7.9.



## **Appendix J**

# **Additional Tables with the 2019 Data on U.S. Trade Flows of Goods with SSA**

## Additional Tables with the 2019 Data on U.S. Trade Flows of Goods with SSA

**Table J.1** Fastest-growing U.S. exports to SSA countries, by absolute change, 2016–19

Product	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
					Million \$	Percent
Motor vehicles	834	876	1,165	1,268	433	15.0
Certain motor-vehicle parts	338	437	697	729	391	29.2
Natural gas and components	162	236	449	550	388	50.2
Cereals	690	808	469	859	169	7.6
Poultry	282	433	465	451	169	16.9
Polyethylene resins in primary forms	152	123	143	317	165	27.8
All others	11,025	11,154	12,480	11,556	531	1.6
<b>Total</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>15,730</b>	<b>2,246</b>	<b>5.3</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

**Table J.2** Fastest-growing U.S. exports to SSA countries, in percentage terms, 2016–19

Product	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
					Million \$	Percent
Oilseeds	( <sup>a</sup> )	( <sup>a</sup> )	19	6	6	327.5
Miscellaneous articles of wood	1	( <sup>a</sup> )	( <sup>a</sup> )	24	24	243.0
Certain ores, concentrates, ash, and residues	1	1	1	31	30	218.7
Primary aromatics	( <sup>a</sup> )	0	0	( <sup>a</sup> )	( <sup>a</sup> )	184.1
Malt beverages	( <sup>a</sup> )	1	1	2	2	151.5
Ferroalloys	( <sup>a</sup> )	143.5				
All others	13,482	14,063	15,846	15,666	2,183	5.1
<b>Total</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>15,730</b>	<b>2,246</b>	<b>5.3</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

**Table J.3** Fastest-growing U.S. imports from SSA countries, by absolute change, 2016–19

Product	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
					Million \$	Percent
Precious metals and non- numismatic coins	1,501	2,086	2,443	2,425	924	17.3
Apparel	1,036	1,055	1,249	1,465	428	12.2
Certain ores, concentrates, ash, and residues	484	597	717	823	339	19.4
Natural and synthetic gemstones	1,482	1,856	2,273	1,709	227	4.9
Spices	242	436	542	446	204	22.6
Unwrought aluminum	72	187	259	213	141	43.8
All others	15,343	18,640	17,593	13,931	-1,412	-3.2
<b>Total</b>	<b>20,160</b>	<b>24,857</b>	<b>25,075</b>	<b>21,013</b>	<b>853</b>	<b>1.4</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

**Table J.4** Fastest-growing U.S. imports from SSA countries, in percentage terms, 2016–19

Product	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
					Million \$	Percent
Saturated polyester resins	( <sup>a</sup> )	0	53	62	62	5,807.4
Iron and steel waste and scrap	( <sup>a</sup> )	( <sup>a</sup> )	6	4	4	767.6
Scales and weighing machinery	( <sup>a</sup> )	179.7				
Inorganic acids	( <sup>a</sup> )	0	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	164.5
Ignition, starting, lighting, and other electrical equipment	3	1	14	34	31	128.0
Air-conditioning equipment and parts	4	3	49	38	34	118.1
All others	20,153	24,853	24,952	20,875	721	1.2
<b>Total</b>	<b>20,160</b>	<b>24,857</b>	<b>25,075</b>	<b>21,013</b>	<b>853</b>	<b>1.4</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

## Additional Tables with the 2019 Data on U.S. Trade Flows of Goods with SSA

**Table J.5** U.S. imports for consumption under AGOA, by leading growth product, in terms of absolute change, 2016–19

Product	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
Million \$					Percent	
Apparel	1,010	1,033	1,218	1,420	411	12.1
Edible nuts	99	125	163	192	92	24.6
Miscellaneous inorganic chemicals	109	113	204	178	69	17.8
Ferroalloys	335	646	586	391	56	5.3
Canned fish	1	6	35	53	53	332.6
Precious jewelry and related articles	104	126	149	146	42	11.9
All others	8,786	11,601	9,744	6,019	-2,767	-11.8
<b>Total</b>	<b>10,444</b>	<b>13,650</b>	<b>12,047</b>	<b>8,369</b>	<b>-2,043</b>	<b>-7.0</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.**Table J.6** U.S. imports for consumption under AGOA, by leading growth product, in terms of percentage change, 2016–19

Product	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
Million \$					Percent	
Canned fish	1	6	35	53	53	332.6
Wood veneer and wood panels	( <sup>a</sup> )	( <sup>a</sup> )	1	2	2	179.7
Cured and other fish	( <sup>a</sup> )	0	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	176.5
Welding and soldering equipment	( <sup>a</sup> )	( <sup>a</sup> )	( <sup>a</sup> )	1	1	140.9
Industrial fasteners of base metal	( <sup>a</sup> )	137.7				
Farm and garden machinery and equipment	( <sup>a</sup> )	133.6				
All others	10,443	13,643	12,064	8,343	-2,099	-7.2
<b>Total</b>	<b>10,444</b>	<b>13,650</b>	<b>12,100</b>	<b>8,400</b>	<b>-2,043</b>	<b>-7.0</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

<sup>a</sup> Less than \$500,000.

**Table J.7** U.S. imports from SSA countries, by leading source countries, in absolute change, 2016–19

Country	2016	2017	2018	2019	Absolute	Compound
					Change 2016-2019	annual growth rate 2016-2019
Million \$						
						Percent
South Africa	6,784	7,735	8,468	7,799	1,015	4.8
Ghana	321	750	581	943	621	43.2
Nigeria	4,172	7,050	5,617	4,609	437	3.4
Republic of the Congo	132	128	433	563	431	62.1
Madagascar	445	743	892	846	401	23.8
Ethiopia	236	291	445	572	336	34.3
Cameroon	151	118	220	331	180	29.9
Equatorial Guinea	193	356	580	328	134	19.2
Kenya	553	572	643	667	115	6.5
Senegal	55	72	127	131	77	34.0
All others	7,117	7,040	7,070	4,224	-2,894	-16.0
<b>Total</b>	<b>20,160</b>	<b>24,857</b>	<b>25,075</b>	<b>21,013</b>	<b>853</b>	<b>1.4</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.

**Table J.8** U.S. exports to SSA countries, by leading destination countries, in absolute change, 2016–19

Country	2016	2017	2018	2019	Absolute	Compound
					change 2016-2019	annual growth rate 2016-2019
Million \$						
						Percent
Nigeria	1,895	2,173	2,686	3,178	1,284	18.8
South Africa	4,600	5,051	5,517	5,334	734	5.1
Togo	229	456	642	431	201	23.4
Ethiopia	826	877	1,308	1,021	195	7.3
Tanzania	158	145	332	332	175	28.2
Somalia	39	71	49	105	67	39.5
Botswana	42	93	82	104	62	35.0
Chad	33	31	53	85	52	37.1
Republic of the Congo	83	76	78	131	48	16.5
Mozambique	149	177	184	196	46	9.4
All others	5,430	4,915	4,935	4,812	-618	-3.9
<b>Total</b>	<b>13,484</b>	<b>14,066</b>	<b>15,868</b>	<b>15,730</b>	<b>2,246</b>	<b>5.3</b>

Source: USITC DataWeb/USDOC (accessed February 18, 2020).

Note: Due to rounding, figures may not add up to totals shown.