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Africa Agriculture Trade Monitor

2018

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The Regional Strategic Analysis and Knowledge Support System (ReSAKSS)

Established in 2006 under the Comprehensive Africa Agriculture Development Programme (CAADP), the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) supports efforts to promote evidence- and outcome-based policy planning and implementation. In particular, ReSAKSS provides data and related analytical and knowledge products to facilitate CAADP benchmarking, review, and mutual learning processes. The International Food Policy Research Institute (IFPRI) facilitates the work of ReSAKSS in partnership with the African Union Commission (AUC), the NEPAD Planning and Coordinating Agency (NPCA), leading regional economic communities, and Africa-based CGIAR centers.

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Acronyms

ADB	African Development Bank
AECF	Africa Enterprise Challenge Fund
AMIS	Agricultural Market Information System
ATOR	Annual Trends and Outlook Report
AU	African Union
BACI	International Trade Database at the Product Level
CAADP	Comprehensive Africa Agriculture Development Programme
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CES	Constant Elasticity of Substitution
CET	Constant Elasticity of Transformation
CFAF	West African CFA francs
CIF	Cost, Insurance, and Freight
CMS	Constant Market Share
COMESA	Common Market for Eastern and Southern Africa
DFID	Department for International Development
EAC	East African Community
EBA	Everything but Arms
EC	European Commission
ECA	United Nations Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECDPM	European Centre for Development Policy Management
ECENE	Enquête sur le Commerce Extérieur non Enregistré au Cordon Douanier
ECOWAS	Economic Community of West African States
ECX	Ethiopia Commodity Exchange
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign direct investment
FRICH	Food Retail Industry Challenge Fund
GDP	Gross Domestic Product
HIC	High-Income Countries
HS	Harmonized System
ICTs	Information and Communications Technologies
IFPRI	International Food Policy Research Institute
IISD	International Institute for Sustainable Development
IMF	International Monetary Fund

INSTAT	Institut National de la Statistique et de l'Analyse Economique
IPCC	Intergovernmental Panel on Climate Change
IRTG	Improved Road Transport Governance Initiative
ITC	International Trade Center
KACE	Kenya Agricultural Commodity Exchange
KPMG	Klynveld Peat Marwick Goerdeler
LARES	Laboratoire d'Analyse Régional et d'Expertise Sociale
LDCs	Least Developed Countries
NCC	National Cotton Council of America
NEPAD	New Partnership for Africa's Development
NES	Not Elsewhere Specified
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PAE	Public Agricultural Expenditure
RCA	Revealed Comparative Advantage
RECs	Regional Economic Communities
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
RTAs	Regional trade and investment agreements
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAFEX	South African Futures Exchange
SPS	Sanitary and Phytosanitary Measures
SSA	Africa south of the Sahara
STDF	Standards and Trade Development Facility
TBT	Technical Barriers to Trade
TEI	Trade Expansion Indicator
TOI	Trade Overlap Indicator
TSR	Trade Status Report
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WEF	World Economic Forum
WITS	World Integrated Trade Solution
WTO	World Trade Organization

Country Abbreviations

AGO	Angola
BDI	Burundi
BEN	Benin
BFA	Burkina Faso
CAF	Central African Republic
CIV	Côte d'Ivoire
CMR	Cameroon
COG	Republic of the Congo
COM	Comoros
CPV	Cape Verde
DJI	Djibouti
EGY	Egypt
ERI	Eritrea
ETH	Ethiopia
GAB	Gabon
GHA	Ghana
GIN	Guinea
GMB	Gambia
GNB	Guinea-Bissau
GNQ	Equatorial Guinea
KEN	Kenya
LIB	Liberia
MDG	Madagascar
MLI	Mali
MOZ	Mozambique
MUS	Mauritius
MWI	Malawi
NER	Niger
NGA	Nigeria
RWA	Rwanda
SDN	Sudan
SEN	Senegal
SLE	Sierra Leone
STP	São Tomé and Príncipe
SYC	Seychelles
TCD	Chad
TGO	Togo
UGA	Uganda
ZAR	Democratic Republic of the Congo
ZMB	Zambia
ZWE	Zimbabwe

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FOREWORD

Boosting intra-African trade and deepening regional integration offer an effective vehicle to speed up Africa's economic transformation. Increasing the volumes of intra-African trade in agricultural products and the elimination of non-tariff barriers have the potential to boost industrialization and enhance competitiveness, at country and industry levels, through higher investments in connectivity and infrastructure, both physical and digital.

Policies that enhance intra-regional trade in the continent such as the Continental Free Trade Area (CFTA) and the Tripartite Free Trade Agreement (FTA) will be crucial to building a single continental market for goods and services, along with free movement of labour and capital and greater harmonisation in standards and procedures.

The CFTA will have a combined GDP of about $2.3 trillion and a population of more than 1.2 billion people, with more than half comprising the youth. It will open up the continent to new investors and better opportunities for its entrepreneurs.

Given the large amount of money spent on imported food, the demographic changes taking place, the huge opportunities offered by urban markets across the continent not to mention the immense productive potential for agriculture in Africa, it is evident that there are both significant opportunities and a pressing need for greater intra-African and intra-regional agricultural trade.

To maximise the benefits of regional integration and look for new opportunities for agricultural competitiveness, policymakers, the private sector and development partners need access to accurate, comprehensive and reliable data on intra and inter-regional agricultural trade in Africa.

It is in this context that we launched the first annual edition of the Africa Agriculture Trade Monitor (AATM). The Report is the fruit of a collaborative endeavour between the International Food Policy Research Institute (IFPRI) and the Technical Centre for Agricultural and Rural Cooperation (CTA). It builds on the work of the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) and the African Growth and Development Policy Modelling Consortium (AGRODEP) on trade, both facilitated by IFPRI under its work in support of the African Union Commission's Comprehensive Africa Agriculture Development Programme.

The 2018 edition of the AATM examines the status and trends in competitiveness of African countries in global as well as intra-African agricultural markets. The report also analyses key determinants of trade performance among African countries, as well as opportunities to expand trade within regional blocks and at the continental level. We believe that the report will make an important contribution towards the data and analysis needed to advance efforts to promote intra-African trade and better integrate agricultural markets across the continent.

This report reflects IFPRI and CTA's commitment to advancing sharing of knowledge and best practices relating to agricultural trade in Africa. We hope the data and findings in the report will generate great interest and value among policy-makers and practitioners.

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EXECUTIVE SUMMARY

Trade is an important avenue through which countries transform their economies and raise standards of living. For African countries, trade in agricultural products offers great potential to boost incomes for farmers, processors and other agricultural value chain actors; increase incentives for productivity-enhancing investments along the value chain; and gain foreign reserves that can be used for imports of products not produced at home. Intra-regional trade also offers considerable potential to reduce the vulnerability of economies both by presenting an alternative to international markets in the case of global price shocks, and by smoothing the effects of local production shocks through better access to less volatile regional food supplies.

African countries have increased their agricultural trade at the global and regional levels in recent years. However, Africa's agricultural trade remains low and below its potential. Despite the importance of agriculture in African economies, the continent accounts for only a minor share of global agricultural exports. Recent growth in intra-regional trade notwithstanding, Africa's countries trade with each other far less than do countries in other world regions. The challenges faced by African producers and exporters are many. Constraints to global and regional trade include the poor quality of physical infrastructure, inefficient customs processes and high harassments costs, inconsistent regional standards and regulations, and nontariff trade barriers including stringent food safety and traceability requirements in importing countries. Agricultural trade is also affected by wider challenges facing agriculture as a sector, including constrains to increasing productivity; underdeveloped connections between smallholder producers and other value chain actors; and increasingly frequent and severe weather shocks in the context of climate change. In the 2014 Malabo Declaration, African leaders committed to addressing many of these challenges and to tripling the level of intra-regional trade by 2025.

The 2018 Africa Agriculture Trade Monitor, the first in a series of annual reports, assesses long-term and emerging trends and drivers of Africa's global, intra-Africa, and intra-regional economic community trade in agricultural products. It examines Africa's recent performance in different markets and identifies changes in the composition and direction of trade. It evaluates determinants of trade volumes and competitiveness and reviews developments in and outside of the agricultural sector at the Africa and global levels that affect Africa's trade performance. Trends are described at the continental level as well as among four major regional economic communities (RECs): the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of West African States (ECOWAS), the Economic Community of Central African States (ECCAS), and the Southern African Development Community (SADC). The report also contains a feature chapter on West Africa, which examines the potential for trade within the region to increase the resilience of food markets, and reviews potential interventions to increase intra-regional trade. Findings from the report and related policy implications are presented below.

Major Findings and Recommendations

Africa's agricultural trade has increased over time, with faster growth in imports contributing to a growing trade deficit. Africa's agricultural imports and exports have both increased significantly in the past decades. The continent's agricultural exports tripled in value between 1998 and 2013, while the value of imports increased fivefold, due in part to strong growth in population and incomes and increased food demand. Following accelerating import growth, Africa's agricultural trade balance turned negative in the early 2000s and has widened rapidly thereafter. The trade deficit was reflected in most regions of the continent; of the major RECs, only SADC showed a trade surplus over the 1998–2013 period. In 2013, imports from North and South American countries made the largest contribution to Africa's agricultural trade deficit,

although the continent maintained smaller deficits with European Union (EU) and Asian countries. Major imported commodities contributing to the deficit included sugar, maize, and wheat from North and South America; wheat, milk and cream from the EU; and rice, palm oil, and wheat from Asia.

Despite the importance of agriculture in African economies and recent export growth, the continent plays a relatively small role in global agricultural trade, accounting for around 4 percent of global agricultural exports. The share of agricultural products in Africa's total trade has also declined sharply as exports of textiles, minerals and fossil fuels increased their share. In 2013, agricultural products represented 11 percent of Africa's total exports, a decrease by almost half from 19 percent in 1998.

Africa's agricultural trade has diversified in terms of export commodities as well as trade partners. Africa's agricultural exports have long been concentrated in a narrow range of products. Although traditional export commodities continue to dominate, exports have significantly diversified over time. The top 10 exported agricultural products represented 57 percent of all agricultural exports in 1998, but this share had decreased to 43 percent in 2013. Cocoa beans were the top export in both years, accounting for around 13–14 percent of agricultural exports. Coffee and cotton, the second and third most exported products in 1998, remained important in 2013, but export shares for both products had declined. Cotton remained the second-most exported product in 2013, while citrus fruits became the third-most exported product, and frozen fish, cigars and cigarettes, and oilseeds entered the top ten.

Africa's imports have remained more stable than exports in terms of composition and shares. The top ten imported products represented 52 percent of total agricultural imports in 1998 and 49 percent in 2013. Product categories remained similar, with eight commodities featuring among the top ten during both years. Wheat was the largest import by far in both years, accounting for 16 and 13 percent of agricultural imports in 1998 and 2013, respectively. Rice rose in prominence as an import over the period, and by 2013 gained the second largest import share. Sugar was the second-most imported product in 1998 and the third in 2013. Palm oil showed a large gain in importance over the period, becoming the fourth-most imported product in 2013. Meat and cigars and cigarettes, which were not among the top ten imported commodities in 1998, had entered the ranking by 2013.

In 1998, the EU accounted for over 60 percent of Africa's agricultural exports and over 40 percent of imports. Although the EU remains Africa' dominant agricultural trade partner, its share of both exports and imports has declined over time, to under 40 percent of exports and 30 percent of imports in 2013, while shares of other regions have increased. In 2013, Asia was a close second to the EU in terms of both imports and exports. Agricultural exports to Asia and the EU tend to be high-value products and cash crops such as cotton, coffee, flowers, fruits, tea, tobacco and fish. North and South America account for a relatively small share of Africa's agricultural exports, but are much more important as a source of imports, with a share that has surpassed that of the EU in some years.

Intra-regional trade in Africa is increasing, but remains below its potential. Although Africa's level of intra-regional trade is still low compared to that of other regions, intra-regional trade has increased over time. The value of intra-African agricultural trade increased by 12 percent annually over the 1998–2013 period. This rapid growth caused the share of intra-regional trade in Africa's total trade to increase from 8 percent in 1998 to 21 percent in 2013. Many factors have limited the growth of intra-regional trade in Africa, including insufficient trade-related infrastructure, limited private sector participation in regional integration initiatives, and challenges related to institutional quality. Of the major RECs, SADC had the highest intra-regional trade share during the period, while ECCAS had the lowest. However, ECCAS showed the most rapid growth in intra-regional trade volumes and values over the period. Many REC member states tended

to trade more within their REC than with other African countries, with ECOWAS and SADC countries showing particularly high concentrations of intra-REC trade.

The composition of intra-African trade remained similar over the 1998–2013 period, but several product groups gained or lost share. Processed food products accounted for around 40 percent of intra-African trade throughout the period; fish products and cereals accounted for a further 8 and 7 percent throughout the period, respectively. However, coffee reduced its share from 10 percent during 1998–2006 to 7 percent during 2007–2013. At the level of individual products, frozen fish was the third-most traded commodity during 1998–2006 but replaced cotton as the most-traded commodity during 2007–2013. Sugar was the second-most traded commodity during both subperiods; cigars and cheroots increased their share and moved from eighth to third place between the two subperiods.

African countries lost competitiveness in global markets but gained in intra-regional markets. Around 65 percent of African countries lost some competitiveness in global agricultural markets during the 1998–2013 period, increasing their exports less than the group of their competitors. The lowest-performing countries were Equatorial Guinea, Western Sahara, Angola, and Chad. Among the more than 35 percent of countries which outperformed their competitors, Cabo Verde, Somalia, Algeria and Djibouti showed the highest increases in competitiveness. However, most of Africa's major exporting countries experienced little change. Of the major RECs, ECOWAS countries were the most successful in increasing competitiveness in global markets, while ECCAS and SADC countries tended to lose competitiveness.

At the commodity level, African exporters increased their competitiveness in global markets for three-fourths of the commodities studied. The largest increases in competitiveness were for rye, barley, and oats; soybean oil; cattle; silk; and dairy, eggs, and honey. Most losses in competitiveness were modest; the products with the largest losses were groundnut oil, meat and edible offal, and chemicals. Most traditional African cash crops, including cotton, coffee, cocoa beans, tea, groundnut oil, and palm oil, either lost competitiveness or experienced small gains. However, many new export products, such as wool, soybeans, soybean oil, live trees and plants, and cocoa preparations, showed strong gains in competitiveness, suggesting the potential for diversifying exports by expanding trade in these areas.

African exporters showed stronger competitiveness gains in intra-regional than in global markets, reflecting the significant growth in intra-regional trade over the period. 60 percent of countries increased their competitiveness by expanding exports to intra-African markets faster than their competitors, with Djibouti, Comoros, Egypt, Algeria, and Ethiopia showing particularly strong gains. The largest losses in competitiveness were seen in Mali, Central African Republic, Chad, and São Tomé and Príncipe. On average, COMESA countries were particularly successful at increasing competitiveness in intra-African markets. African exporters increased competitiveness in intra-African markets for around half of the commodities studied. Commodities showing particularly strong performance included rye, barley and oats; olive oil; and gums and resins. The commodities showing the largest competitiveness losses in regional markets were organic chemicals, soybeans, and groundnut oil.

Africa's agricultural export performance can be attributed to domestic as well as global factors, including trade infrastructure, institutional efficiency, and nontariff trade barriers. Domestic supply-side factors appear to play a stronger role in determining the level of Africa's agricultural exports than global or demand-side factors; however, both categories are relevant in explaining export performance. Supply-side factors that affect agricultural exports include agricultural productivity, government expenditures, and trade-related institutions and infrastructure. Land productivity positively affects agricultural export performance, but labor productivity has a negative effect; this may reflect the fact that countries with higher agricultural labor productivity are those which are undergoing structural trans-

formation and where export composition is shifting to nonagricultural products. The quality of port infrastructure and the efficiency of customs clearing both have strong positive effects on trade performance. This underlines an urgent need to improve port quality and customs efficiency in Africa, both of which are much lower than in other world regions. Public agricultural expenditure in exporting countries is used as a proxy for government support to agriculture, including extension services, financial services, and support of market access. Overall, public agricultural expenditures significantly improve export performance, although the effect does not hold everywhere, likely due to the differing focuses of public expenditure in different countries. Being a member of a REC also increases exports, demonstrating the positive trade creation effects of economic and trade integration efforts among REC members.

Trade policies in importing countries also affect Africa's agricultural trade performance. Tariff rate increases reduce agricultural exports from Africa, and nontariff barriers show an even stronger trade-reducing effect: in particular, sanitary and phytosanitary requirements relating to food safety and health and export subsidies decrease African agricultural exports. Support to domestic agricultural producers in OECD countries also reduces Africa's trade. African countries have limited control over trade policy in other countries, but they should continue to take part in global efforts to lower trade barriers. In addition, much can be accomplished by addressing the domestic constraints to expanding trade.

Expanded intra-regional trade can increase the resilience of markets. Analysis of production and trade patterns in West African countries demonstrates the potential for expanded intra-regional trade to increase the stability and resilience of markets and food supplies. If production instability patterns in neighboring countries differ sufficiently, then production shocks affecting one country can be offset by supplies from another country, making regional food supplies more stable and smoothing price volatility. The report finds that in nearly all West African countries, with the exception of only Côte d'Ivoire, national production was more volatile than regional production during the 1980–2010 period. There is therefore real scope for expanded regional trade to reduce the volatility of food supplies. In addition, West African countries' production and export patterns are sufficiently dissimilar as to allow opportunities for expanding trade. The region shows high levels of overlapping trade flows, indicating that many of the products being imported from outside of the region are also being exported by other West African countries to markets outside of the region. The products with the highest overlapping trade flows are, in most cases, products in which West Africa has comparative advantage, indicating significant scope to expand crossborder trade by redirecting these trade flows. Trade within West Africa has expanded considerably since 1998, and simulations suggest that trade will continue to grow in the next decade. However, intra-regional trade growth can be accelerated significantly by reducing the cost of trade or increasing agricultural yields. For instance, simulation results show that the elimination of harassment costs, a 10 percent reduction in overall trading costs, or an equivalent increase in yields would raise intra-ECOWAS trade in staple crops by between 10 and 28 percent.

To improve trade performance, action is needed to raise productivity along the value chain, reduce trade costs, and eliminate barriers to trade. African policymakers recognize the importance of agricultural trade for economic development and have committed to tripling the level of intra-regional agricultural trade by 2025. Several emerging developments at the regional, continental, and global level provide opportunities to improve Africa's trade performance and meet high-level goals. However, participating in regional and global markets also present challenges that need to be addressed.

Africa's growing population is becoming richer and more urban, leading to changes in the composition of diets and stronger demand for higher-value and processed food products. This presents valuable opportunities for African farmers, processors, and other value chain actors, as well as potential for increased intra-regional trade. However, numerous constraints

must be dealt with to prevent demand growth from further inflating Africa's agricultural trade deficit. Other promising developments at the Africa level include the growth of information and communication technologies (ICTs), which are being deployed in efforts to increase agricultural productivity and facilitate trade, as well as initiatives within RECs to harmonize regulations and decrease barriers to intra-regional trade. At the global level, demand for high-value agricultural products presents lucrative opportunities for African producers as well as challenges to meet strict food safety and traceability requirements.

A major challenge to Africa's agricultural and trade performance is climate change, which is already altering weather patterns and which is expected to decrease agricultural yields in Africa overall. The potential effects of climate change on production and trade are complex, but food security is expected to be negatively affected without action to address the effects. Concerted efforts are required, including investments to raise productivity, use resources wisely, and reduce risk, as well as participation in global climate change mitigation and adaptation efforts.

Policymakers should continue efforts to raise agricultural productivity, including by allocating greater public expenditures to agriculture and to agricultural research and development in particular. Productivity enhancements should be promoted all along the value chain, in processing and marketing as well as on the farm. In addition, efforts must be made to integrate smallholders into value chains, helping them access inputs and service providers as well as link with processors and markets. Governments can provide an enabling environment for value chain development by strengthening market institutions and investing in infrastructure. African countries should take advantage of global capacity building efforts to strengthen trade facilitation, while also supporting agricultural producers in meeting international requirements. African countries and regions should continue their progress in enhancing regional integration and work to dismantle administrative and regulatory barriers to regional trade.

1. INTRODUCTION

Ousmane Badiane, Sunday Pierre Odjo, and Julia Collins

Trade provides the potential for improving consumer welfare and producer incomes, boosting overall economic growth, and reducing poverty. In Africa, greater and more diversified agricultural trade at global and regional levels could leverage efforts to raise productivity at all stages along the value chain, thereby facilitating the transformation of African agriculture into a high-productivity sector, providing adequate incomes for producers and stimulating growth throughout the economy. Increasing agricultural trade also has the potential to improve food security and contribute to stabilizing local and regional food markets by making them less vulnerable to shocks.

In addition to the benefits of global trade, intra-regional trade has been increasingly recognized as a key element of efforts to increase food security and agricultural development across Africa. The 18th African Union Summit in 2012 took the theme of "Boosting Intra-African Trade," then in 2014—as one of a limited number of commitments in the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods—African leaders committed to tripling intra-African trade in agricultural commodities and services by 2025. The trade commitment included accelerating the establishment of a continental free trade area and a continental common external tariff, as well as taking measures to increase investments in trade infrastructure and enhance Africa's position in international trade negotiations.

Despite longstanding recognition of the benefits of trade and the importance of improving competitiveness, Africa is performing beneath its potential in global and regional agricultural markets. Recent growth in exports has been offset by even larger growth in imports, leading to a deterioration of Africa's trade balance. Intra-regional trade in Africa is growing, but it remains significantly below the levels seen in other parts of the world. These challenges result from a host of factors, including historical trends and more recent developments both within and beyond Africa. Action is needed on many fronts to remove constraints to improving the competitiveness of Africa's producers.

In 2013, the Regional Strategic Analysis and Knowledge Support System (ReSAKSS), the official monitoring and evaluation body of CAADP, published its *Annual Trends and Outlook Report (ATOR)* under the theme of "Promoting Agricultural Trade to Enhance Resilience in Africa." The report reviewed patterns in Africa's global and regional agricultural trade, and examined the relationship between agricultural trade and the resilience of African countries and regions to shocks, including food price volatility and weather shocks. The report detailed the significant progress that has been made in improving Africa's trade performance in recent years, as well as the challenges that remain at global and regional levels.

The Africa Agriculture Trade Monitor (AATM) builds on the analyses presented in ReSAKSS's 2013 ATOR by providing detailed descriptive assessments of the status and recent trends in Africa's trade performance and competitiveness at the continental and regional levels, as well as more in-depth investigations of the determinants of trade performance and the relative importance of different drivers and constraints. The report represents the first in a series of yearly publications examining the status, trends, and outlook of Africa's trade performance, the goal of which is to provide comprehensive and timely evidence and analysis to inform policy discussions on measures to enhance trade performance at global and regional levels.

Chapter 2, by Fousseini Traore and Daniel Sakyi, examines trends and patterns in Africa's global agricultural trade during the 1998–2013 period. The study assesses trends in overall trade volumes and values, and in the trade of key agricultural commodities. The chapter then analyzes the direction of agricultural exports and imports, changes in market shares,

and changes in the composition of Africa's exports and imports, to provide a comprehensive overview of Africa's agricultural trade with the rest of the world.

Chapter 3, by Anatole Goundan and Cheickh Sadibou Fall, addresses regional trade, discussing Africa-wide and regional trade patterns. The chapter reviews intra-regional trade performance for the continent as a whole and for its major regional economic communities (RECs). It then proceeds to analyze the direction of trade, examine the role of individual RECs and countries in intra-regional trade, and discuss the key commodities in intra-regional trade.

Chapter 4, by Sunday Pierre Odjo and Ousmane Badiane, presents a detailed analysis of the competitiveness of African agricultural exports in global and regional markets. The chapter aims to shed light on the factors behind recent improvements in trade performance in order to further accelerate gains and reduce trade deficits. The study ranks countries and commodities according to their competiveness in export markets at the global, continental, and REC levels. The chapter then summarizes an econometric analysis of the drivers of changes in competiveness at different levels, and presents recommendations for further improving competiveness.

Chapter 5, by Getaw Tadesse and Ousmane Badiane, provides an in-depth examination of the determinants of African agricultural trade performance. The chapter reviews broad categories of trade determinants, including production capacity, the cost of trade, trade policies, domestic agricultural supports, and global market shocks. The chapter then develops a gravity model to assess the relative importance of determinants of African trade and of different trade constraints, discussing how these constraints have changed over time and vary across countries.

Agricultural trade performance is also affected by a host of other factors unrelated to agriculture and by the broader global context. Chapter 6, by Nicholas Sabwa and Julia Collins, presents a review of these broader determinants and a discussion of their effects on African trade and other potential future impacts. Trends affecting trade include developments within Africa—such as increasing urbanization and the rise of a middle class, the growing agro-processing sector, and the surge in the use of information and communications technologies in agriculture and finance—and changes at the global level—such as climate change, oil shocks, and biotechnology. The chapter also focuses on recent regional integration efforts within Africa, and major multilateral and bilateral agreements with global trade partners. The chapter presents recommendations on managing current and likely future developments in order to maximize benefits and minimize threats to food security and trade performance.

Chapter 7, by Sunday Pierre Odjo and Ousmane Badiane, focuses on the outlook for expanding intra-regional trade within West Africa, the focus region of this issue, and the potential effects of expanded trade on regional food markets. The chapter reviews recent trends in intra-regional trade and examines the possibilities for increased regional trade to reduce food price volatility. The study then evaluates the scope for increasing trade within the region. A simulation model is used to examine the effects of alternative policy scenarios on regional trade and on the stability of regional food markets.

Chapter 8, by Ousmane Badiane, Sunday Pierre Odjo, and Julia Collins, provides a brief summary of the findings of the preceding chapters, synthesizing the results and policy implications of addressing the constraints to improving Africa's agricultural trade performance.

2. AFRICA'S GLOBAL TRADE PATTERNS

Fousseini Traore and Daniel Sakyi

The trade performance of African countries has improved in recent years, although it is still below expectations compared with other regions of the world. This notwithstanding, and although the region is currently considered among the fastest-growing in the world, Africa's trade performance continues to be dominated by the agricultural sector. Overall, Africa's competitiveness has slightly improved over time, and trends show significant diversification of exports since 1998. This has occurred for several reasons: (1) participation in multilateral and bilateral negotiations, such as the World Trade Organization Doha Development Agenda and Economic Partnership Agreements; (2) benefits received from preferential trade agreements, such as the African Growth and Opportunity Act, Everything but Arms (EBA), and so on; and (3) deeper regional integration through free trade agreements, customs unions, and so on. In addition, foreign direct investment (FDI) from developed and emerging countries has contributed to the transformation of both agriculture and trade (FAO 2012; Cheru and Modi 2013).

Agriculture remains a key sector, with significant potential in global food markets, especially in terms of value-added (NEPAD 2013).[1] Yet the region's share of agricultural exports has declined since 1998. This constitutes a critical challenge for Africa, given its rich natural resource endowments and potential for developing high-value agricultural export products, both for local and global markets. It is, therefore, not surprising that agricultural transformation across Africa features heavily in the 2014 Malabo Declaration. Consequently, the commitment to tripling intra-African trade in agricultural commodities and services by 2025 is seen as key to growth because its expansion will trickle down to other sectors of the region's economy.

In recent years, trends in international trade were largely driven by sluggish economic growth and persisting economic and political turmoil in various parts of the world. Between 2011 and 2014, world trade grew at a rate of less than 2 percent per year, generally due to lower economic growth, but also because trade was much less responsive to output growth—which was particularly the case for Africa (UNCTAD 2015). Regarding agricultural products, while world agricultural exports grew at 7 percent per year between 2010 and 2014, Africa's exports grew by 5 percent, outperforming trade in manufacturing, which grew at 4 percent (WTO 2015).

Africa's agricultural exports increased steadily during 1998–2013, whereas its share of global trade fluctuated at around 4 percent and declined slightly from 2009. The main Regional Economic Communities (RECs) showed contrasting patterns in export growth. The Economic Community of Central African States (ECCAS) and the Southern African Development Community (SADC) registered relative declines, while the Common Market for Eastern and Southern Africa (COMESA) remained stable, and the Economic Community of West African States (ECOWAS) recorded significant short-run volatility. Since the early 1980s, Africa's agricultural exports have lagged behind imports, yielding a growing trade deficit.

[1] In fact, agriculture accounts for a significant share of Africa's GDP –for example, about 20 percent in 2015 according to World Bank (2015)—and therefore presents considerable potential for supporting broader growth and the eradication of poverty and hunger.

Figure 2.1. Normalized trade balance, 1998–2013

Source: CEPII (2015).

The region recorded a negative value in its net exports between 2001 and 2013, a pattern confirmed by the normalized trade balance (Figure 2.1).[2] The main drivers of this surge in imports were rapid population growth and urbanization, income changes due to economic growth, and changes in dietary patterns. Among the RECs, SADC was the only region to register a consistent trade surplus.

Noticeably, Africa's trade flows to and from the European market trended downward, whereas trade with regional partners and Asian countries continued to rise. Africa also registered a decrease in the concentration of its exports during 1998–2013. Another interesting feature is the relative decline in agriculture's share of total African exports, indicating that the main source of foreign earnings now comes from nonagricultural products. Overall, however, despite the region's attempt to become integrated into the global market, work remains to be done in the areas of diversification, integration, and meeting international standards.

This chapter examines Africa's global trade patterns for the 1998–2013 period. Specifically, the next section highlights trends in Africa's agricultural trade, both in terms of value and volume, focusing on key agricultural commodities. This is followed by a discussion of changes in market shares and net agricultural exports, detailed analyses of the direction of African's exports and imports, a discussion of the changing composition of agricultural exports and imports over time, and of changes in unit values of agricultural exports and imports. The final section presents conclusions.

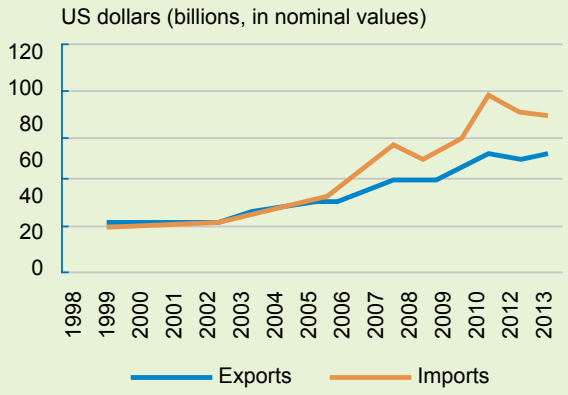
[2] A country's normalized balance is calculated as its agricultural exports minus its agricultural imports, divided by its total agricultural trade (imports and exports). The resulting index ranges between –1 and 1.

Trends in the Volume and Value of Global Agricultural Trade

Global Patterns

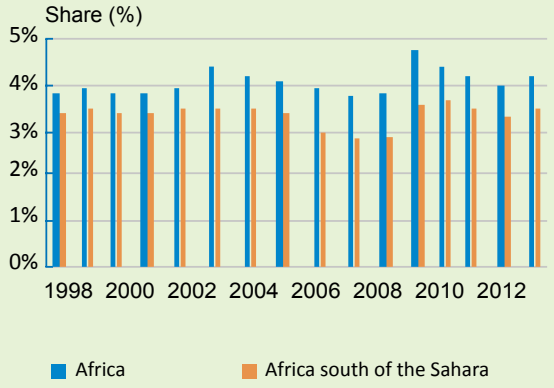
Globally, agricultural exports and imports by African countries have increased steadily during 1998–2013, even though Africa's share of global agricultural trade remained relatively constant, and imports were generally higher than exports (Figures 2.2 and 2.3).[3] After declining in the 1990s, Africa's exports increased at an average rate of 8 percent per year during 1998–2013, and more than doubled over the entire period. From 2008 to 2013 (the postcrisis period), the yearly rate of agricultural export growth was 6.6 percent, reaching a peak value of approximately $63.85 billion in 2013 (UNCTAD 2015).

Figure 2.2. Total agricultural trade flows, 1998–2013



Source: CEPII (2015).

Figure 2.3. Share of global agricultural exports, 1998–2013



Source: CEPII (2015).

The reasons for the increase in exports include rising prices of various commodities in more recent years, improved African infrastructure (mostly transport and telecommunications), economic growth, and greater regional and global integration.

The value of agricultural imports increased even more rapidly after 1998: for the entire period, imports increased fivefold. Specifically, the value of agricultural imports rose from $19.07 billion in 1998 to approximately $68.28 billion in 2008 (with a dip in 2009 to $60.61 billion). Total trade in agricultural imports rose again between 2009 and 2011, peaking at approximately $98.89 billion. Levels declined slightly from 2012 resulting in a total import value of approximately $89.18 billion in 2013. The higher imports may be attributed to both demand and supply factors. On the demand side, the main elements of note were increasing income levels due to higher economic growth, population growth and demographic changes, and changes in consumers' dietary patterns (FAO 2015; Rakotoarisoa, Iafrate, and Paschali 2011).

[3] Unless otherwise specified, all data in this chapter refer to total (aggregated) African trade–that is, imports and exports among African countries and with the rest of the world. The main source of data is the International Trade Database at the Product Level (BACI) built by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). Based on the United Nations' Comtrade Database, BACI offers a procedure for reconciling exporter and importer declarations using both mirror data and gravity modeling (Gaulier and Zignago 2010). This means that data are available for a significantly larger number of countries. See Appendix A for a more complete description of the database.

The income effect due to economic growth was at play in some countries like Ghana and Mozambique, with consequences for dietary patterns.

For instance, with higher incomes, consumers demand more protein (such as meat, fish, milk, and peanuts). The other cause of increasing imports was population growth and rapid urbanization in Africa with a concomitant increase in rural population. Africa is indeed the most dynamic region in terms of demographics: the population in Africa south of the Sahara more than doubled between 1985 and 2013, and as of 2013, one third of people were living in cities (World Bank, 2015). By comparison, the world's population grew by 45 percent during this timeframe. The consequence of the rapid urbanization and population growth was increased consumption of more diversified and richer animal products, and of imported cereals (wheat, rice, and maize) rather than the more regularly consumed local cereals (such as millet), roots, and tubers (FAO 2015). This trend has continued since 2013, and will continue into the future given that Africa's population growth rate is twice the global average. The increase in imports also reflects agricultural constraints, such as the region's inability to sufficiently raise supply to meet the food requirements of the growing population. Low and slowly rising agricultural productivity, water constraints, low fertilizer use, and low mechanization are key underlying factors (FAO 2015).

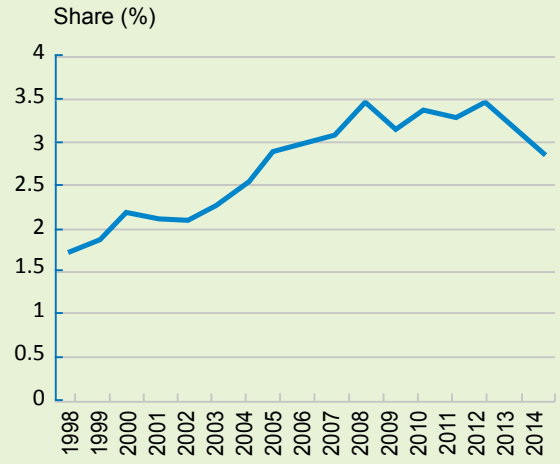
Most regions recorded a trade deficit over the period—with the exception of the SADC region, which recorded a surplus for the entire period (see Appendix 2B). The trade deficit is particularly important for North African countries, which are huge cereal importers. According to recent studies, 23 African countries are highly import-dependent, having normalized trade-balance index values ranging from –1 to –0.1, while 37 countries are net importers of food (FAO 2015).

The growing agricultural trade deficit suggests that it is necessary for African countries to take relevant steps to improve export performance based on the region's "agrarian" environment. African agriculture must gradually be transformed from being subsistence-oriented to having a more commercial focus, as doing so—in addition to other measures, such as improved technology and skills—will greatly improve agricultural exports.

African shares of world exports have fluctuated below 4 percent with a few exceptions, the lowest share being 3.8 percent in 2008 (Figure 2.3). Shares of world exports have followed similar trends in the countries of Africa south of the Sahara (SSA) as those of Africa as a whole, with respect to the years of peaks and troughs, meaning that North African countries do not significantly contribute to the region's agricultural exports. Trends clearly show that shares of agricultural exports are generally low by world standards, both for Africa as a whole and for SSA (Figure 2.3). The evolution of Africa's share of global exports is linked to the evolution of its competitiveness in world markets. Indeed, two-thirds of African countries registered a loss in competitiveness, whereas the remaining one-third managed to expand their exports in world markets faster than their competitors (see Chapter 4, this volume).

Africa's low share of world agricultural trade contrasts with the fact that agricultural products continue to constitute a high share of GDP in most African countries, and that agriculture employs a large proportion of the workforce (World Bank 2015). Some have explained this by the fact that, compared with other countries or regions, agricultural production in Africa is largely on a subsistence scale (Collier and Dercon 2014; Bryceson 2015), reducing the overall share of agricultural exports from Africa and SSA. However, Africa's share of global agricultural exports is slightly larger than its share of global merchandise exports, reflecting its relative specialization in agricultural products (Figure 2.3 compared with Figure 2.4). Another interesting feature is the relative decline in the share of agriculture in Africa's total exports (Figure 2.5). Indeed, the share of agricultural products fell by half between 1998 and 2013, indicating a symmetrical increase in export earnings from other sources (mainly textiles, minerals, and fossil fuel). As of 2013, agricultural exports represented 11 percent of Africa's total exports.

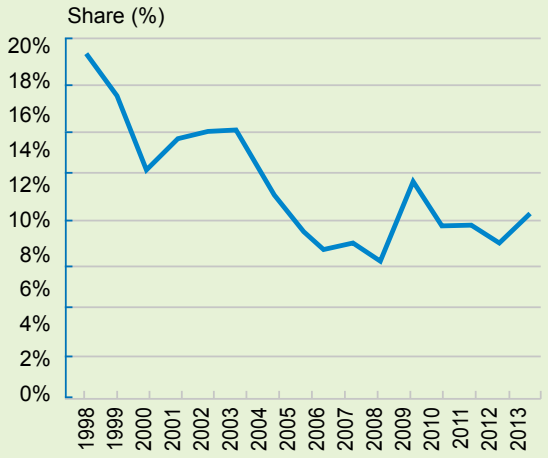
Figure 2.4. Share of global exports, 1998–2014 (nominal values)



Source: UNCTAD (2014).

Note: Data include trade in goods and services

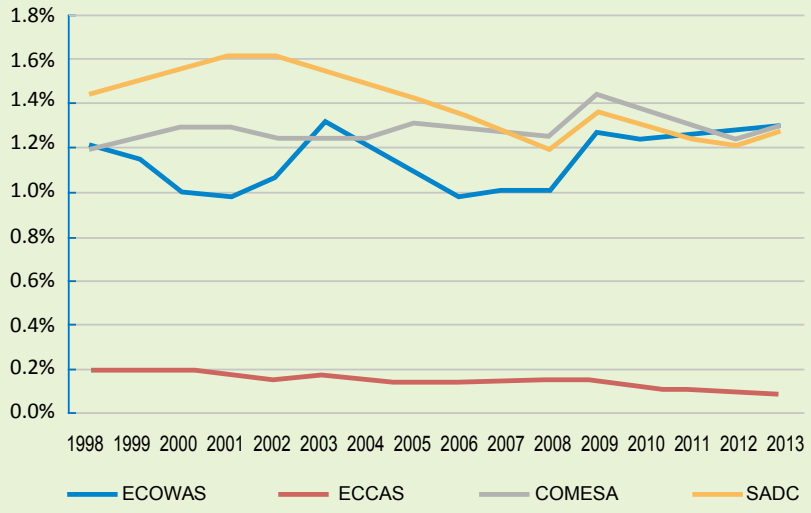
Figure 2.5. Share of agriculture in Africa's total exports, 1998–2013 (nominal values)



Source: CEPII (2015).

In general, trends in the market shares for the main RECs follow those of Africa as a whole (Figure 2.6). The evolution in some groups, however, is more pronounced than for others. ECCAS, which has the lowest share, also recorded a secular decline for the entire period. This pattern is confirmed by a lack of competitiveness during 1998–2013, compared with its main competitors (see Chapter 4, this volume). After a rise in its market share in the late 1990s, SADC also recorded a relative decline during this period, with a decline in competitiveness. ECOWAS's market share fluctuated but improved in the most recent years, whereas COMESA's market share remained relatively stable. The divergent evolution of the subregional market shares stems from their differences in terms of commodities exported (see Appendix B), and to their ability to respond to rising prices and to compete with other exporters in global markets.

Figure 2.6. Export shares of agricultural products by major regional economic community, 1998–2013



Source: CEPII (2015).

Notes: COMESA = Common Market for Eastern and Southern Africa; ECCAS = Economic Community of Central African States; ECOWAS = the Economic Community of West African States; SADC = the Southern African Development Community.

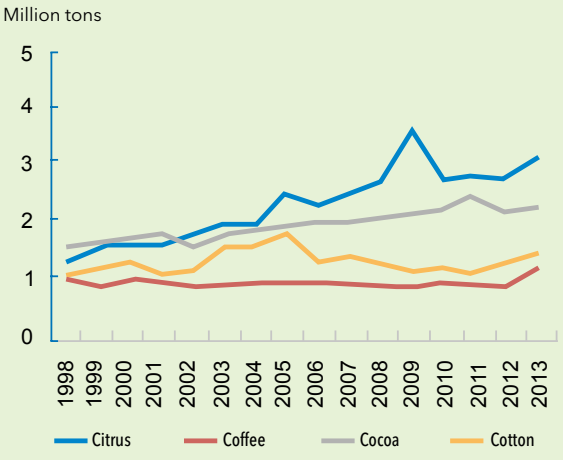
The Evolution of Some Key Export Commodities

This section focuses on some key commodities, particularly citrus, coffee, cocoa, and cotton (the main commodities exported in 1998) and fish and related products that are not part of the World Trade Organization agreement on agriculture. In terms of volume, although citrus was the second most exported commodity after cocoa during 1998–2002, it outstripped the volume of cocoa exported during 2002–2013 (Figure 2.7). Notwithstanding, cocoa was the most exported commodity in terms of value during 1998–2013, with the values of citrus, coffee, and cotton all performing below that of cocoa over the same timeframe (Figure 2.8).

Globally, the prices of cocoa and coffee have risen continually since 2000 (Figure 2.9). Nevertheless, with the exception of the 2001–2004 period, the price of coffee grew faster than the price of cocoa. In addition, the cotton price maintained a relatively stable growth rate during 2000–2009 (Figure 2.10). By 2011, the price of cotton had more than doubled its 2000 level, although the peak in 2011 did not last.

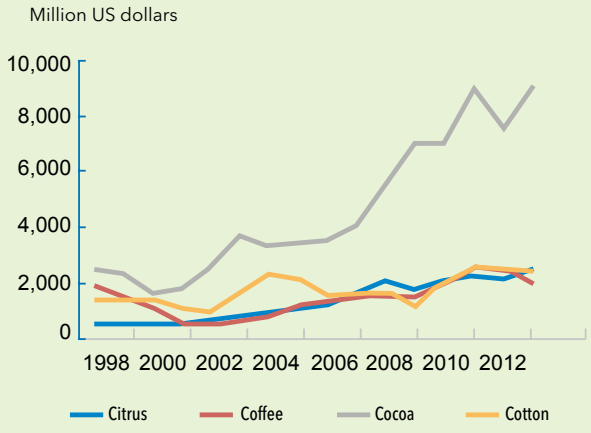
What is interesting is the imperfect and even opposite correlation between the volume of exports and world prices at the end of the period, with the exception of cocoa (Figures 2.7 compared with Figure 2.9). Despite the huge drop in the world prices of cotton and coffee, export volumes continued to rise after 2011. This may be due to an imperfect transmission of international price shocks to local producers' prices (due to stabilization mechanisms in play, exchange rate movements between the US dollar and local currencies, and so on), but also to an income effect that gave producers incentives to supply more when prices fell (Yotopoulos and Lau 1974).

Figure 2.7. Key commodities by export volume, 1998–2013



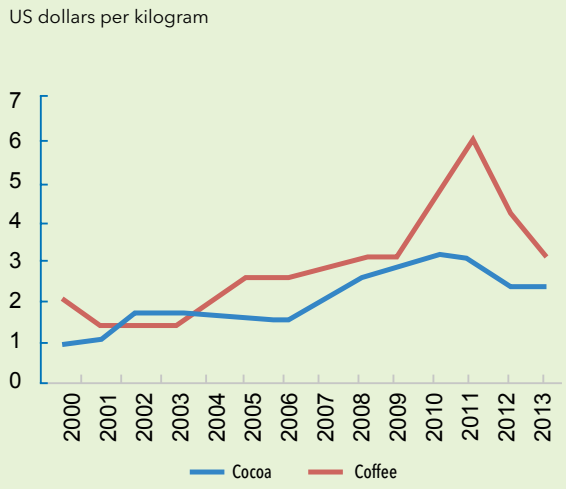
Source: CEPII (2015).

Figure 2.8. Key commodities by export value 1998–2013



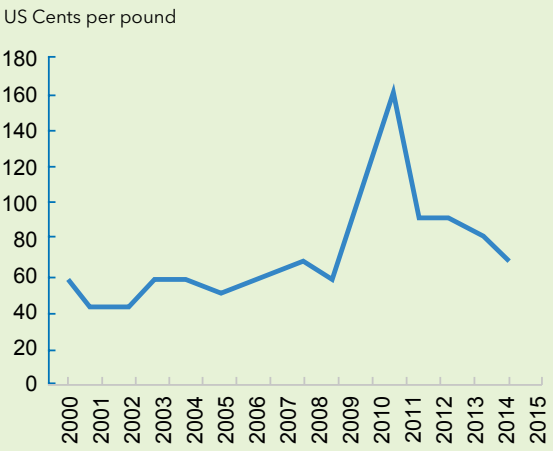
Source: CEPII (2015).

Figure 2.9. Cocoa and coffee prices, 2000–2013



Source: World Bank (2016)

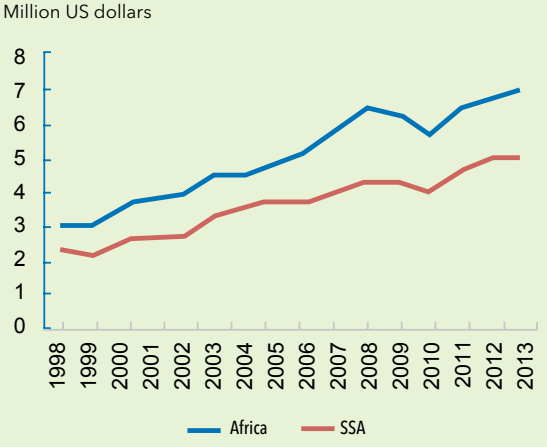
Figure 2.10. Cotton Cotlook A index, 2000–2015



Source: NCC (2016)

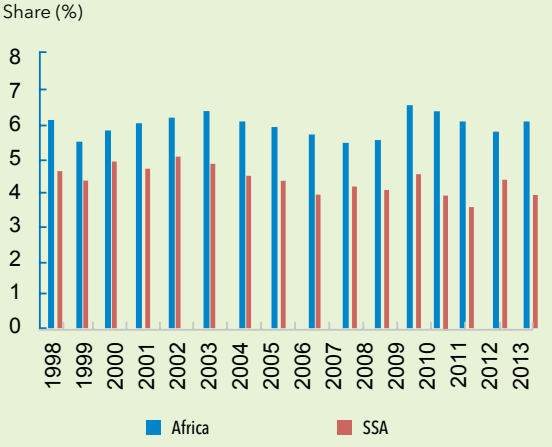
Fish and related products represent a huge share of agricultural exports for some African countries (such as Senegal) but are not part of the World Trade Organization agreement on agriculture. During 1998–2013, on average, fish exports represented 15 percent of total agricultural exports. Africa's and SSA's exports of fish and related products doubled during this timeframe, rising from $3.12 to $7.17 billion and $2.29 to $4.98 billion, respectively (Figure 2.11). In general, for both Africa and SSA, exports of fish and related products rose during 1998–2008, fell during 2008–2010, then rose again during 2010–2013. Trends were similar for the 1998–2013 period (Figure 2.12). It is worth noting that Africa's average share of global fish exports is higher than its average share in agricultural product exports, indicating a greater role in, and potential for, that particular market.

Figure 2.11. Trends in export value of fish and related products, 1998–2013



Source: CEPII (2015).

Figure 2.12. Share of global fish trade, 1998–2013



Source: CEPII (2015).

Agricultural Export and Import Flows and Changes in Market Shares

Africa's agricultural products are exported throughout the world, but the most commonly exported commodities are cash crops. In particular, African countries export crops including cotton, cocoa, coffee, cassava, and sorghum. Naturally, the flow of these exports depends on shifts in demand for them. Figures 2.13 and 2.14 show the flow of Africa's agricultural exports within African countries, to Europe, to Asia, and to the Americas during 1998–2013. Free trade areas and improved local infrastructure promoted increased export flows within Africa, although levels were still low compared with exports outside the region (Figure 2.14). The export share among African countries averaged 15.7 percent during 1998–2012, despite the low base rate of 11.1 percent in 1998.

Exports to Europe trended downward, from 62.1 percent of the total in 1998 to 37.5 percent in 2013. Nevertheless, Europe remains the primary destination for African agricultural exports. Some African countries began developing tropical products for export to the European Union (EU) market to take advantage of preferences granted by EU countries (EBA for instance), but EU and sanitary and phytosanitary standards have a dampening effect on agricultural exports (Otsuki and Sewadeh 2001; Kareem 2014). It is also worth noting that EU negotiations with some of Africa's competitors, such as Asia and Latin America, create the risk of erosion of preferences for African countries for some commodities, such as cocoa and bananas. Exports to Asia (and Europe) are mostly high-value, low-calorie agricultural products. Notable among them are cotton, coffee, flowers, fruit, tea, tobacco, and fish. Exports of agricultural products to Asia increased at a slower rate between 1998 and 2012, whereas exports to the Americas—that is, both North America and Latin America—have been fairly low (Figure 2.14). Until 2012, the share of exports to the Americas was less than 9 percent. The highest export share to the Americas between 1998 and 2013 was 9.7 percent in 2012, but the 2013 share fell to 5.6 percent (Figure 2.13). Europe, on the other hand, received the highest share of Africa's exports, at 37.5 percent in 2013 (Figure 2.13).

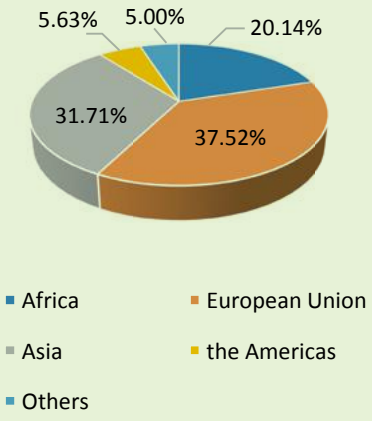
On the import side, in 1999 12.5 percent of the region's imports came from within Africa (Figure 2.15). This increased to 16.0 percent in 2003, then fell to 12.4 percent in 2008. However, these low figures do not account for informal crossborder trade between African countries, which consists of flows of local products and of re-exports of imported products, sometimes in order to circumvent protectionist policies in some countries against imports from the international market (see the Nigeria-Benin case reported in LARES 2005 and Golub 2012). Since estimates of intraregional trade volumes are based on official statistics (customs declarations), the volume of trade is substantially underestimated. For instance, more than 50 percent of Benin's trade in red meat, cattle, and cereals in 2010 was informal (INSTAT 2010). Finally, the share of trade within Africa varies across commodities: cereals and live animals are the most commonly exported commodities within Africa, whereas coffee, cocoa, and tea are mostly exported beyond Africa.

Some obstacles to intra-African trade remain, however. Among these are inadequate transport, storage, and preservation infrastructure; tariffs, nontariff barriers, and export bans; technical barriers; customs procedures; lack of harmonization of procedures and documentation; lack of recognition of national certificates and standards; migratory procedures; and roadside inspections (Rolland and Alpha 2011; Levard and Benkhala 2013).

The majority of Africa's imports come from Europe. It is evident that, in 1998, 42.0 percent of the region's imports came from the EU (Figure 2.15). Although the share of imports from the EU has fallen since 1998, the region remains the largest originator of African imports. Imports from the Americas have risen steadily over time and averaged a 26.6 percent share during 1998–2003. Moreover, the highest imports to Africa in 2011 were from the Americas. Within the Americas, imports from North America fell, which benefited Latin America. The share of imports from Asia also grew substantially, from 11.3 percent in 1998 to 26.4 percent in 2012, contracting to 24.8 percent in 2013. The main feature of note is the decline of European imports and the rise of both imports and exports from Asia during this timeframe.

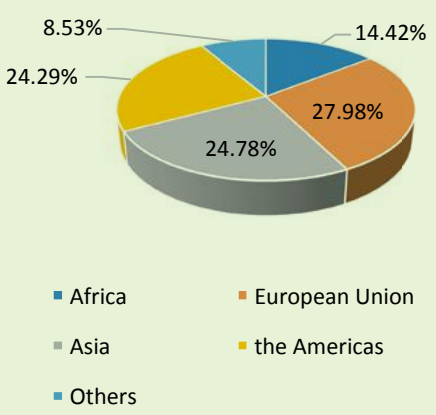
Figure 2.13. Direction of agricultural exports and imports, 2013

Exports (nominal values)



Source: CEPII (2015).

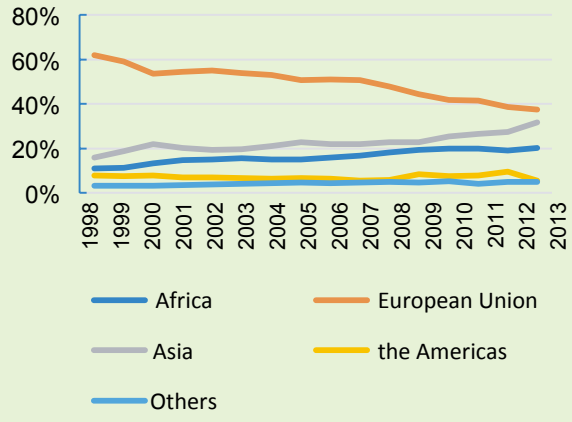
Imports (nominal values)



Source: CEPII (2015).

Figure 2.14. Directions of agricultural exports, 1998–2013

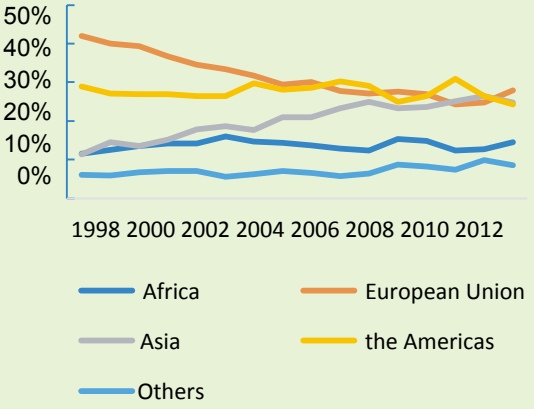
(nominal values)



Source: CEPII (2015).

Figure 2.15. Directions of agricultural imports, 1998–2013

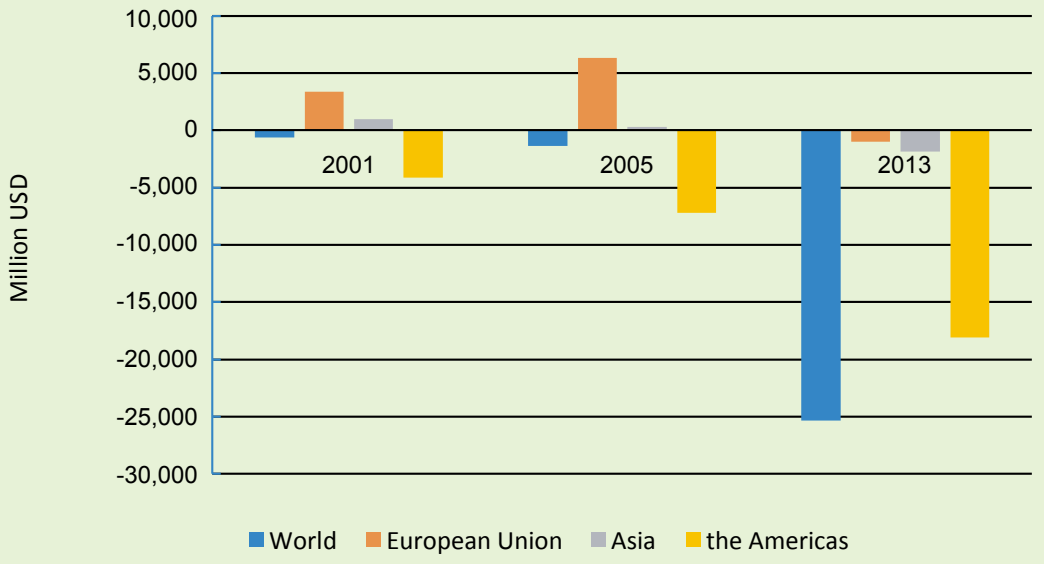
(nominal values)



Source: CEPII (2015).

The main contributor to Africa's trade deficit is the Americas, with negative values of US$4 billion in 2001, US$7 billion in 2005 and US$18 billion in 2013 (Figure 2.16). The EU and Asia recorded surpluses of US$3.3 billion and US$0.9 billion, respectively, in 2001. Net agricultural exports to the global market worsened thereafter, however, as Africa began recording deficits with both Asia and the EU, in addition to the Americas. The lowest deficit was recorded in 2011 (US$39.7 billion globally). That same year, Africa recorded negative values of US$8.3 million to Asia, US$1.6 million to the EU, and US$25.3 billion to the Americas. Although the net agricultural export deficit declined somewhat, it was still largely negative as of 2013. In addition, the global deficit mainly resulted from increased imports, not declining exports. The main import commodities responsible for the deficit were sugar, maize, and wheat from the Americas; wheat, milk, and cream from the EU; and rice, palm oil, and wheat from Asia.

Figure 2.16. Net agricultural exports, selected years (nominal values)



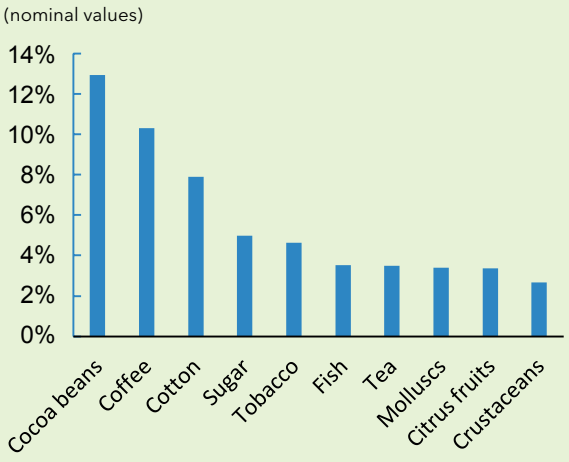
Source: CEPII (2015).

Changes in Composition of Agricultural Exports and Imports

Over time, the composition of agricultural exports and imports in Africa was mixed. It showed greater diversification of exports and relative stability for imports, with slight modifications over time. It is widely recognized that African exports are highly concentrated (Kose and Riezman 2001; Songwe and Winkler 2012). Within the agricultural sector, however, Africa appears to have begun to diversify gradually over time. The top-ten exported products (according to HS4 categorizations[4]) represented 57 percent of all exports in 1998 and 43 percent in 2013, indicating a decrease in the concentration of exports (Figure 2.17). Nevertheless, six of the top ten products in 1998 were also among the top ten in 2013. Cocoa beans were the region's most exported agricultural product in both 1998 and 2013. Coffee and cotton emerged as the second and third most exported products in 1998, representing US$2 billion and US$1.5 billion, respectively. Among others, sugar, tobacco, tea, citrus fruit, grapes, and apples were also among the top ten exported agricultural products in 1998. Exports of cotton, citrus fruit, and tobacco declined after 1998, whereas cigars and cigarettes, oilseeds, and frozen fish—which were absent from the list in 1998—were among the top ten exported products in 2013.

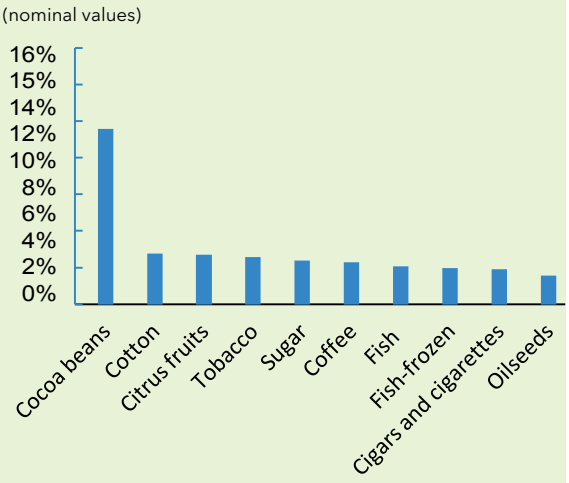
[4] The Harmonized System (HS) is an international nomenclature for the classification of products that allows participating countries to classify traded goods on a common basis for customs purposes.

Figure 2.17. Top ten agricultural export products by value, 1998



Source: CEPII (2015).

Figure 2.18. Top ten agricultural export products, by value, 2013

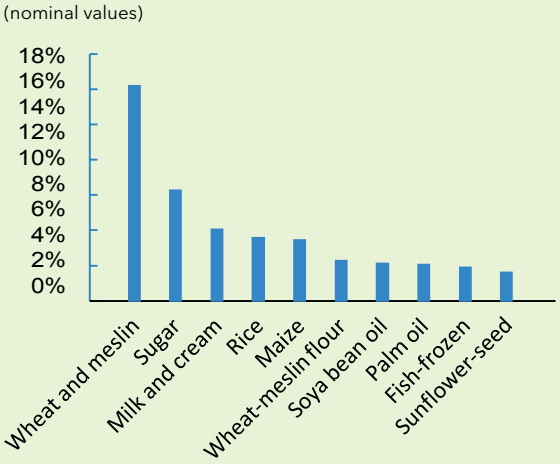


Source: CEPII (2015).

Unlike exports, Africa's imports remained relatively stable over time in terms of both composition and shares (Figure 2.18). In 1998 the top-ten (HS4) products represented 52 percent of imports, compared with 49 percent in 2013. Eight of the top-ten commodities imported in 1998 were also among the top ten in 2013 (Figures 2.19 and 2.20).

Wheat and meslin flour headed the top-ten list in both years. Sugar ranked second in 1998 and third in 2013; rice ranked fourth in 1998 and second in 2013. New entries into the top ten imported products in 2013 were meat and edible offal, and cigars and cigarettes, in place of wheat and meslin flour, and sunflower seed in 1998.

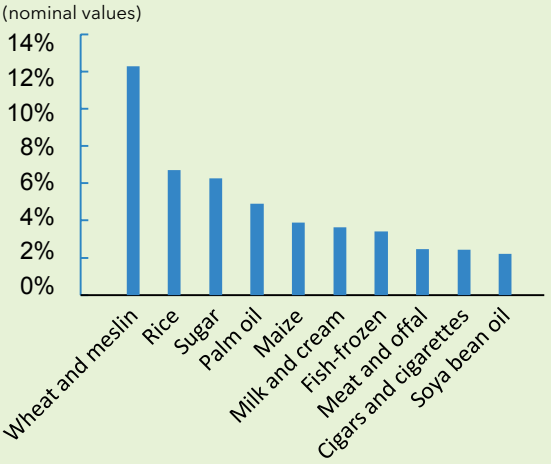
Figure 2.19. Top ten imported products, 1998



Source: CEPII (2015).

Note: Calculated based on share of agricultural imports.

Figure 2.20. Top ten imported products, 2013



Source: CEPII (2015).

Note: Calculated based on share of agricultural imports.

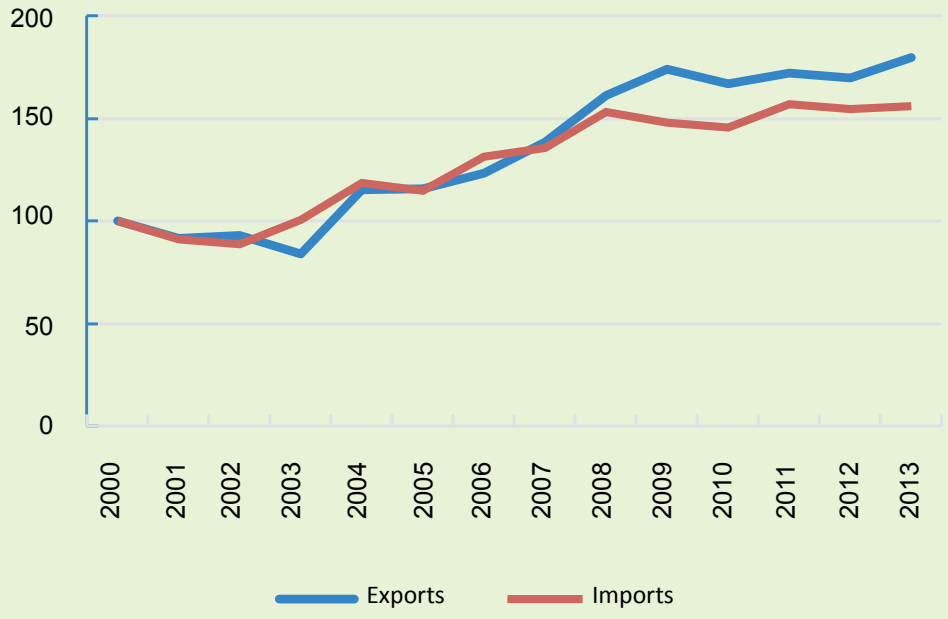
Changes in Unit Values of Agricultural Exports and Imports

Trends in agricultural imports and exports from 2000 until 2013 indicate changes in unit values (Figure 2.21). This can be explained with reference to the so-called Prebisch-Singer hypothesis (Prebisch 1950; Singer 1950), which argues that over the long run the price of primary commodities declines relative to the price of manufactured goods, causing the terms of trade to deteriorate in countries that export primary products and import manufactured ones. Nevertheless, recent research on this topic has yielded mixed results (Arezki et al. 2013).

Overall, the unit values of both agricultural imports and exports rose during 2000–2013, following a mixed pattern (Figure 2.21).

From 2000 to 2007, trends in both indicators show a significant increase, with imports rising faster than exports, yielding a slight deterioration of the agricultural terms of trade. During 2008–2013, the unit value of exports outstripped the unit value of imports. This improvement was mainly due to the huge increase in commodity prices in the late 2000s, which is in line with global trends in terms of trade for Africa (UNCTAD 2015). This trend is more relevant for agricultural trade than for total trade, where nonagricultural products (oil and minerals) were the contributing factor.

Figure 2.21. Trends in the unit value of exports and imports, 2000–2013 (100=2000)



Source: CEPII (2015).

Conclusion

Africa experienced a significant increase in the value of both its exports and its imports over the 1998–2013 period, boosted by increased international commodity prices. However, from 1998 to 2013, imports grew more rapidly than exports, in both percentage and value terms, yielding a growing trade deficit. This trend was driven by increased imports, mainly due to population and economic growth, changes in dietary patterns, increasing income levels, and the lack of competitiveness of the domestic sector. Among the main RECs, the SADC region is the only one to record a surplus for the entire period.

Africa's share of global trade in agriculture remained stable around 4 percent, with some small fluctuations between 2010 and 2013. Trends in market shares for the main RECs indicate a regular decline for ECCAS and SADC, relative stability for COMESA, and a highly volatile pattern for ECOWAS. One of the main interesting features is the decline in the agricultural sector's contribution to Africa's total exports, which was cut by half during 1998–2013 to the benefit of minerals and fossil fuels.

The composition of agricultural exports and imports in Africa was mixed, with exports becoming increasingly more diversified and imports remaining relatively stable. Indeed, Africa's agricultural exports seem to have started a gradual diversification. As of 2013, the top ten (HS4) exported products constituted 43 percent of exports compared with 57 percent in 1998. Nevertheless, most of the top-ten exported commodities in 1998 were still among the top ten in 2013, with a concentration of cocoa beans, coffee and cotton. Unlike exports, both the composition and shares of Africa's imports remained quite stable during 1998–2013. The top-ten (HS4) products still represented half the imports, with cereals (wheat, rice, maize) and sugar remaining dominant, combined with an increase in protein (meat and offal, and fish).

In terms of directions of trade, both imports and exports with the European market declined from 2000, although the EU remains Africa's predominant trade partner. At the same time, Asia emerged as a major import and export partner. If the trend were to continue, Asia will soon overtake the EU to become Africa's primary trade partner. It is worth noting that the ability to meet export standards, including sanitary and phytosanitary measures, still dampens Africa's export potential, especially in European and U.S. markets. The risk of the erosion of preferences for some African countries also exists; the EU, for instance, has ongoing negotiations with some of Africa's competitors, such as Asia and Latin America—the main commodities at risk being cocoa beans and bananas.

African countries have also expanded trade within the region in recent years and have hence become less dependent on international markets. In particular, the shares of agricultural imports and exports among African countries more than doubled between 2000 and 2013. Recent improvement in intra-African trade can be attributed to efforts to integrate African markets at both regional and international levels (Bouet, Laborde, and Deason 2013). Despite this improvement, intra-African trade is still low and needs to be strengthened. Market fragmentation—including lack of infrastructure; monetary, tax, and trade fragmentation; and bureaucratic barriers for traders—limits the development of the region's trade potential. These barriers should be addressed with priority because they increase price instability within the region and negatively affect food security (NEPAD 2013; Badiane, Odjo, and Jemaneh 2014).

References

Arezki, R., K. Hadri, P. Loungani, and Y. Rao. 2013. *Testing the Prebisch-Singer Hypothesis since 1650: Evidence from Panel Techniques that Allow for Multiple Breaks.* IMF Working Paper 13/180. Washington, DC: International Monetary Fund.

Badiane, O., S. Odjo, and S. Jemaneh. 2014. "More Resilient Domestic Food Markets through Regional Trade." *In Promoting Agricultural Trade to Enhance Resilience in Africa*, edited by O. Badiane, T. Makombe, and G. Bahiigwa. ReSAKSS Annual Trends and Outlook Report. Washington, DC: International Food Policy Research Institute.

Bouet, A., D. Laborde, and L. Deason. 2013. "Global Trade Patterns, Competitiveness and Growth Outlook." *In Promoting Agricultural Trade to Enhance Resilience in Africa*, edited by O. Badiane, T. Makombe, and G. Bahiigwa. ReSAKSS Annual Trends and Outlook Report. Washington, DC: International Food Policy Research Institute.

Bryceson, D. 2015. "Reflections on the Unravelling of the Tanzanian Peasantry, 1975–2015." In Looking Back, Looking Ahead: Land, Agriculture and Society in East Africa, edited by M. Stahl. Uppsala: The Nordic Africa Institute.

CEPII (Centre d'Etudes Prospectives et d'Informations Internationales). 2015. "*BACI: The International Trade Database at the Product Level*." Accessed April 2017. www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=1

Cheru, F., and R. Modi, eds. 2013. *Agricultural Development and Food Security in Africa: The Impact of Chinese, Indian and Brazilian investments*. London and New York: Zed Books.

Collier, P., and S. Dercon. 2014. "*African Agriculture in 50 years: Smallholders in a Rapidly Changing World?*" *World Development* 63: 92–101.

FAO (Food and Agriculture Organization of the United Nations). 2012. *Trends and Impacts of Foreign Investments in Developing Country Agriculture. Evidence from Case Studies*. Rome._____. 2015. The State of Agricultural Commodity Markets. Rome.

Gaulier, G., and S. Zignago. 2010. *BACI: International Trade Database at the Product-level—The 1994-2007 Version*. CEPII Working Paper 2010-23. Paris: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

Golub, S. 2012. "Entrepôt Trade and Smuggling in West Africa: Benin, Togo and Nigeria." *The World Economy* 35 (9): 1139–1161.

INSTAT (Institut National de la Statistique et de l'Analyse Economique). 2010. *Enquête sur le Commerce Extérieur non Enregistré au Cordon Douanier (ECENE) : Rapport Définitif du Premier Passage*. Cotonou.

Kareem, O. 2014. *The European Union Sanitary and Phytosanitary Measures and Africa's Exports.* EUI Working Paper RSCAS 2014/98. Fiesole, Italy: European University Institute.

Kose, M., and R. Riezman. 2001. "Trade Shocks and Macroeconomic Fluctuations in Africa." *Journal of Development Economics* 65 (1): 55–80.

LARES (Laboratoire d'Analyse Régional et d'Expertise Sociale). 2005. *Le Trafic Illicite des Produits Pétroliers entre le Benin et le Nigeria: Vice ou Vertu pour l'Economie Béninoise?* Technical report. Cotonou: Laboratoire d'Analyse Régional et d'Expertise Sociale.

Levard, L., and A. Benkhala. 2013. *How to Promote Intra-African Agricultural Trade? Analysis of Possibilities and Impediments Regarding the Development of Intra-African Agricultural Trade*. Nogent-sur-Marne, France: Les Editions du GRET.

NCC (National Cotton Council of America). 2016. Monthly Prices [database]. Accessed February 2016. http://www.cotton.org/econ/prices/monthly.cfm

NEPAD (New Partnership for Africa's Development). 2013. *Agriculture in Africa: Transformation and Outlook*. Addis Ababa: African Union/NEPAD.

Otsuki, T., J. Wilson, and M. Sewadeh. 2001. "*Saving Two in a Billion: Quantifying the Trade Effect of European Food Safety Standards on African Exports.*" Food Policy 26 (5): 495–514.

Prebisch, R. 1950. "*The Economic Development of Latin America and Its Principal Problems.*" Economic Bulletin for Latin America 7: 1–12.

Rakotoarisoa, M., M. Iafrate, and M. Paschali. 2011. *Why Has Africa Become a Net Food Importer? Explaining Africa Agricultural and Food Trade Deficits*. Rome: Food and Agriculture Organization of the United Nations.

Rolland, J., and A. Alpha. 2011. *Analyse de la Cohérence des Politiques Commerciales en Afrique de l'Ouest*. Document de Travail 114. Paris: Agence Française de Développement.

Singer, H. 1950. "The Distribution of Gains between Investing and Borrowing Countries." *American Economic Review, Papers and Proceedings 40: 473–485.*

Songwe, V., and D. Winkler. 2012. *Exports and Export Diversification in Sub-Saharan Africa: A Strategy for Post-Crisis Growth*. African Growth Initiative Working Paper 3. Washington, DC: The Brookings Institution.

UNCTAD (United Nations Conference on Trade and Development). 2014. UNCTADStat Database. Geneva.

_____. 2015. *Key Statistics and Trends in International Trade 2015: The Trade Slowdown*. Geneva: UNCTAD, Division on International Trade in Goods and Services, and Commodities.

United Nations. 2016. "*United Nations Comtrade Database.*" Accessed February 2016. https://comtrade.un.org/

World Bank. (2015). World Development Indicators Database. Accessed February 2016. http://databank.worldbank.org/data/reports.aspx?source=World%20Development%20Indicators

World Bank (2016). Commodity Markets [database]. Accessed February 2016.http://www.worldbank.org/en/research/commodity-markets#1

WTO (World Trade Organization). 2015. *International Trade Statistics 2015*. Geneva.

Yotopoulos, P., and L. Lau. 1974. "On Modelling the Agrarian Sector in Developing Countries: An Integrated Approach of Micro and Macroeconomics." *Journal of Development Economics 1: 105–127*.

Appendix 2A. BACI: The International Trade Database at the Product Level

The BACI database is defined at a high level of product disaggregation and is the main source used throughout this chapter. BACI is based on data from the UN Comtrade database, which is the world's largest database of trade statistics, maintained by the United Nations Statistics Division. Comtrade is the main global source of trade statistics in goods, covering more than 95 percent of world trade. BACI endeavors to improve on UN Comtrade by addressing the key issues of missing information for some African countries, reporting in different nomenclatures, lack of distinction between zero trade flows and missing values in raw data, and so on. To address the issues, BACI has developed a procedure that reconciles exporter and importer declarations using both mirror data and gravity modeling (see Gaulier and Zignago 2010). This procedure significantly increases the number of countries with available data.

In its standard version, BACI provides export values and quantities at the HS six-digit level. Data are provided for over 200 countries from 1995 onward, and the database is updated annually. The retreatment of data is particularly important for countries that do not report frequently to Comtrade (especially in Africa). Appendix Table 2A.1 illustrates the data issue and the absence of reporting for ECOWAS countries to UN Comtrade from 1988 to 2010. In BACI, all countries are observed for imports and exports.

Appendix Table 2A.1. ECOWAS countries' declarations to United Nations Comtrade

Country	1988	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Total
Benin	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	13
Burkina Faso				Y	Y	Y	Y	Y		Y	Y	Y	Y	9
Côte d'Ivoire				Y		Y	Y	Y	Y	Y	Y	Y	Y	9
Cabo Verde	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	13
Ghana						Y	Y	Y	Y	Y	Y	Y	Y	8
Guinea	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y			10
Gambia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	13
Guinea-Bissau						Y	Y	Y						3
Liberia														0
Mali	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	12
Niger	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	13
Nigeria		Y		Y	Y	Y			Y	Y	Y	Y	Y	9
Senegal	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	13
Sierra Leone														0
Togo	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	12
Number of countries declaring imports	8	9	8	11	10	12	12	12	10	12	12	10	11	

Source: United Nations (2016).

Note: ECOWAS = the Economic Community of West African States. Y = yes if a country declares in the year in question

Appendix 2B. Main Descriptive Statistics

Appendix Table 2B.1. Africa's top 15 exported products by destination, 2013 (nominal values)

World			Africa			North, Central and South America		
HS4	Value US$ (thousands)	Volume (tons)	HS4	Value US$ (thousands)	Volume (tons)	HS4	Value US$ (thousands)	Volume (tons)
1801	8,949,056	2,588,938	2402	1,659,452	34,813.8	1801	933,360	355,881.7
5201	2,590,810	1,517,283	0303	919,411.9	1,424,777	0901	224,440.7	63,762.3
0805	2,535,454	3,700,486	1701	669,666.3	2,604,785	0805	187,423.8	162,056.8
2401	2,417,195	527,845.9	0709	582,662.9	131,412.5	1803	182,423.8	49,903.4
1701	2,257,720	6,833,846	0902	513,835.6	241,690.7	1509	140,348.4	37,054.3
0901	2,151,131	1,137,948	2401	351,878.4	123,330.4	2204	119,619.3	45,068.3
1604	1,948,820	486,239.3	1511	344,980.4	2,543,051	0303	118,032	57,591.9
0303	1,853,421	1,834,613	1005	295,261.2	1,589,105	2401	102,585.4	25,137.2
2402	1,801,219	46,722.3	1101	285,483	2,860,764	0802	100,752.7	30,831.8
1207	1,472,631	12,451,721	0901	278,569.7	402,602.5	1005	100,256.6	293,195.7
0801	1,452,097	1,611,323	2106	266,778.5	128,092.1	0801	90,033.5	39,679.8
0902	1,347,222	526,269.2	1902	225,433.6	1,218,597	1604	85,488.5	14,904.2
1803	1,346,488	391,861.1	0102	215,255.4	144,427.8	0603	78,142.3	30,699.3
0603	1,274,794	266,750.3	2202	207,381.9	307,924.4	1802	77,175.9	23,988.4
0307	1,097,386	246,285.3	1604	196,898.9	82,363.4	1211	56,772.5	27,141.3

Appendix Table 2B.1 continued.

Asia			European Union		
HS4	Value US$ (thousands)	Volume (tons)	HS4	Value US$ (thousands)	Volume (tons)
1801	3,999,891	326,122.8	1801	3,576,260	1,738,438
5201	2,136,118	1,261,332	1604	1,582,322	367,771.1
0801	1,264,986	1,440,414	1701	1,112,135	3,388,362
0805	1,214,586	1,984,923	0901	1,056,904	468,869.4
1207	1,020,944	650,511.8	0805	954,438.1	1,170,226
2401	1,004,399	151,146	0603	908,689.2	187,579.4
0902	516,089.2	173,524	1803	882,639.2	259,285.2
0307	453,306.5	100,128.9	2401	767,497.2	189,279.5
0901	403,178.8	132,506.4	0806	710,809.7	315,833.6
0406	385,945.1	100,727.4	1804	635,869.3	125,528.2
1005	370,671.5	1,250,419	0307	627,574.8	128,131.7
0104	369,376.8	114,676.2	0803	611,995.4	630,686.3
0713	336,437.6	1,635,826	2204	599,264.4	347,734.6
0303	318,154.1	137,725.6	0304	571,980.9	111,401.3
5101	266,543.5	46,343.2	0702	540,095.2	467,447.5

Source: CEPII (2015).

Note: HS = Harmonized System.
See the list of products corresponding to the HS nomenclature in Appendix Table 2B.4.

Appendix Table 2B.2. Africa's top 15 imported products by origin, 2013 (nominal values)

World			Africa			North, Central and South America		
HS4	Value US$ (thousands)	Volume (tons)	HS4	Value US$ (thousands)	Volume (tons)	HS4	Value US$ (thousands)	Volume (tons)
1001	11,315,164	37,956,637	2402	1,659,452	34,813.8	1701	4,011,909	9,411,226
1006	6,192,685	15,621,186	0303	919,411.9	1,424,777	1001	3,148,162	10,857,641
1701	5,789,882	15,825,559	1701	669,666.3	2,604,785	1005	2,303,404	8,999,137
1511	4,536,369	10,423,995	0709	582,662.9	131,412.5	2304	1,835,747	4,138,790
1005	3,606,254	14,965,351	0902	513,835.6	241,690.7	0207	1,423,035	1,123,708
0402	3,365,801	1,062,497	2401	351,878.4	123,330.4	1507	1,006,265	1,293,838
0303	3,164,988	2,972,965	1511	344,980.4	2,543,051	1201	984,894.7	1,782,988
0207	2,295,812	1,755,920	1005	295,261.2	1,589,105	0202	738,227.8	251,871
2402	2,256,805	89,823.4	1101	285,483	2,860,764	0402	649,771.9	170,187.6
1507	2,044,662	2,457,679	0901	278,569.7	402,602.5	0713	387,738.9	522,599
2304	1,926,556	4,629,271	2106	266,778.5	128,092.1	1006	369,890.1	1,135,149
1901	1,749,542	795,508.4	1902	225,433.6	1,218,597	0303	314,510.4	242,943.1
0202	1,505,473	570,665.6	0102	215,255.4	144,427.8	0206	254,577.8	198,430.5
2106	1,461,689	577,673.1	2202	207,381.9	307,924.4	2207	224,787.8	228,138.2
0902	1,161,753	438,684.9	1604	196,898.9	82,363.4	2303	211,352.9	484,886.2

Appendix Table 2B.2. Continued.

Asia			European Union		
HS4	Value US$ (thousands)	Volume (tons)	HS4	Value US$ (thousands)	Volume (tons)
1006	5,568,320	13,508,022	1001	4,772,036	14,966,210
1511	4,142,895	7,450,407	0402	1,560,448	453,891.9
1001	1,562,951	5,523,065	1901	1,272,133	347,804.6
1701	816,755.5	3,337,692	0303	1,161,104	712,226.3
1604	789,623.4	284,669.2	2106	829,718.2	245,938.9
0202	664,980.4	215,213.5	2208	818,824.5	132,224.1
0902	629,274	192,373.3	2403	805,653.5	41,764.71
0303	618,133.8	496,250.9	1507	784,504.3	724,614.6
2002	442,291	434,381.8	0207	764,927	543,898.6
0402	331,543.1	183,218.5	2204	528,823.8	280,842
0901	309,772.6	138,142.9	2202	469,341.3	506,755.1
1516	272,551.5	305,105.8	1107	462,966.1	1,037,474
1512	241,708.3	273,454.3	2203	415,659.4	421,534
1905	238,722	312,852.2	0102	406,498.5	104,375
2009	232,720.1	336,060.3	2309	405,577.4	687,164

Source: CEPII (2015).

Note: HS = Harmonized System.
See the list of products corresponding to the HS nomenclature in Appendix Table 2B.4.

Appendix Table 2B.3. Exports, imports, and trade balance for main regional economic communities (nominal values)

	ECOWAS			ECCAS			COMESA		
Year	Exports	Imports	Trade balance	Exports	Imports	Trade balance	Exports	Imports	Trade balance
				US dollars (thousands)					
1998	6,116,465	3,837,574	2,278,891	985,119	1,316,618	–331,499	5,919,690	6,675,268	–755,579
1999	5,705,731	4,070,148	1,635,583	914,239.2	1,138,998	–224,759	5,953,728	6,225,979	–272,251
2000	4,849,950	3,941,394	908,556	864,932.7	1,435,258	–570,325	6,233,086	6,499,117	–266,031
2001	4,959,724	5,063,406	–103,681	870,867.2	1,669,209	–798,342	6,419,539	7,047,405	–627,867
2002	5,691,559	5,443,531	248,028	769,333.3	1,892,355	–1,123,022	6,575,509	7,367,812	–792,304
2003	8,174,045	7,172,308	1,001,737	1,034,457	2,352,183	–1,317,726	7,708,798	8,389,307	–680,509
2004	8,390,249	6,861,849	1,528,401	1,103,567	2,679,544	–1,575,977	8,639,757	9,309,681	–669,924
2005	8,182,928	8,082,486	100,442	1,259,674	3,046,911	–1,787,236	9,907,420	10,646,105	–738,685
2006	8,111,680	9,648,551	–1,536,872	1,250,582	3,733,047	–2,482,466	10,584,645	12,464,647	–1,880,001
2007	10,009,034	13,088,053	–3,079,019	1,427,620	4,784,696	–3,357,075	12,404,233	15,811,640	–3,407,407
2008	12,135,190	14,878,796	–2,743,606	1,590,252	6,346,862	–4,756,611	14,845,553	24,695,229	–9,849,676
2009	13,785,804	14,440,253	–654,449	1,769,146	5,992,694	–4,223,548	15,491,756	22,310,479	–6,818,723
2010	15,283,877	15,294,911	–11,034	1,800,128	6,405,823	–4,605,695	16,988,548	28,408,191	–11,419,643
2011	18,861,303	28,161,899	–9,300,596	1,900,651	8,795,311	–6,894,660	19,639,714	33,633,079	–13,993,364
2012	19,185,691	20,650,589	–1,464,898	1,860,603	9,031,307	–7,170,704	18,108,289	32,659,977	–14,551,688
2013	20,289,380	21,339,574	–1,050,194	1,767,716	9,572,699	–7,804,983	19,923,744	29,564,524	–9,640,780

Appendix Table 2B.3. Continued.

	SADC			AMU		
Year	Exports	Imports	Trade balance	Exports	Imports	Trade balance
			US dollars (thousands)			
1998	7,316,775	3,996,326	3,320,449	2,253,018	5,898,554	–3,645,536
1999	7,414,659	3,550,548	3,864,111	2,603,562	5,080,264	–2,476,702
2000	7,674,486	3,686,711	3,987,775	2,664,439	5,519,295	–2,854,856
2001	8,231,349	3,772,930	4,458,419	2,695,109	5,702,532	–3,007,422
2002	8,705,809	4,728,753	3,977,056	3,084,234	6,698,156	–3,613,922
2003	9,624,956	5,483,425	4,141,531	3,564,657	6,679,442	–3,114,786
2004	10,467,023	6,865,226	3,601,797	4,242,618	8,502,594	–4,259,976
2005	10,838,574	7,175,830	3,662,744	4,837,408	8,735,021	–3,897,613
2006	11,324,527	8,807,677	2,516,850	5,359,433	9,470,486	–4,111,052
2007	12,726,162	10,976,492	1,749,670	6,482,675	13,694,306	–7,211,631
2008	14,353,135	13,310,628	1,042,507	7,558,859	18,944,213	–11,385,353
2009	14,667,621	12,187,492	2,480,129	6,764,896	14,714,422	–7,949,526
2010	15,569,389	13,877,386	1,692,003	6,821,328	17,067,732	–10,246,405
2011	18,192,694	18,090,398	102,296	7,905,469	22,378,653	–14,473,184
2012	17,702,902	18,748,276	–1,045,374	7,579,879	22,748,748	–15,168,869
2013	19,622,634	19,302,801	319833	8,232,886	24,009,848	–15,776,961

Source: CEPII (2015).

Note: AMU = Arab Maghreb Union; COMESA = Common Market for Eastern and Southern Africa;
ECCAS = the Economic Community of Central African States;
ECOWAS = the Economic Community of West African States;
SADC = the Southern African Development Community.

Appendix Table 2B.4. List of products corresponding to the HS 4 nomenclature

HS4	Product description
0102	Live bovine animals
0104	Live sheep and goats
0202	Meat of bovine animals, frozen
0206	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled, or frozen
0207	Meat and edible offal of the poultry of heading No. 01.05, fresh, chilled, or frozen
0303	Fish, frozen, excluding fish fillets and other fish meat of heading No. 03.04
0304	Fish fillets and other fish meat (whether or not minced); fresh, chilled, or frozen
0307	Molluscs, whether in shell or not; live, fresh, chilled, frozen, dried, salted or in brine; aquatic invertebrates other than crustaceans and molluscs, live, fresh, chilled, frozen, dried, salted or in brine; flours, meals and pellets
0402	Milk and cream, concentrated or containing added sugar or other sweetening matter
0406	Cheese and curd
0603	Cut flowers and flower buds of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared
0702	Tomatoes, fresh or chilled
0709	Other vegetables, fresh or chilled
0713	Dried leguminous vegetables, shelled, whether skinned or split or not
0801	Coconuts, Brazil nuts and cashew nuts, fresh or dried, whether shelled or peeled or not
0802	Other nuts, fresh or dried, whether shelled or peeled or not
0803	Bananas, including plantains, fresh or dried
0805	Citrus fruit, fresh or dried
0806	Grapes, fresh or dried
0901	Coffee, whether roasted or not, or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion
0902	Tea, whether flavored or not
1001	Wheat and meslin
1005	Maize (corn)
1006	Rice
1101	Wheat or meslin flour
1107	Malt, whether roasted or not
1201	Soybeans, whether broken or not
1207	Other oil seeds and oleaginous fruits, whether broken or not
1211	Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh or dried, whether cut or not, or crushed or powdered.
1507	Soybean oil and its fractions, whether refined or not, but not chemically modified
1509	Olive oil and its fractions, whether refined or not, but not chemically modified
1511	Palm oil and its fractions, whether refined or not, but not chemically modified
1512	Sunflower-seed, safflower or cotton-seed oil and fractions thereof, whether refined or not, but not chemically modified
1516	Animal or vegetable fats and oils and their fractions, partly or wholly hydrogenated, inter-esterified, re-esterified or elaidinised, whether or refined not, but not further prepared
1604	Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs
1701	Cane or beet sugar and chemically pure sucrose, in solid form
1801	Cocoa beans, whole or broken, raw or roasted
1802	Cocoa shells, husks, skins and other cocoa waste
1803	Cocoa paste, whether defatted or not
1804	Cocoa butter, fat, and oil
1901	Malt extract; food preparations of flour, meal, starch or malt extract, not containing cocoa or containing less than 40 percent by weight of cocoa calculated on a totally defatted basis, not elsewhere specified or including; food preparations
1902	Pasta, whether cooked or not or stuffed (with meat or other substances) or otherwise prepared, such as spaghetti, macaroni, noodles, lasagna, gnocchi, ravioli, cannelloni; couscous, whether prepared or not
1905	Bread, pastry, cakes, biscuits and other bakers' wares, whether containing cocoa or not; communion wafers, empty cachets of a kind suitable for pharmaceutical use, sealing wafers, rice paper and similar products
2002	Tomatoes prepared or otherwise preserved with vinegar or acetic acid

Appendix Table 2B.4. Continued.

HS4	Product description
2009	Fruit juices (including grape must) and vegetable juices, unfermented and not containing added spirit, whether containing added sugar or other sweetening matter or not
2106	Food preparations not elsewhere specified or included
2202	Waters, including mineral waters and aerated waters, containing added sugar or other sweetening matter or flavored, and other nonalcoholic beverages, not including fruit or vegetable juices of heading No. 20.09
2203	Beer made from malt
	Wine of fresh grapes, including fortified wines; grape must other than that of heading No. 20.09
2204	Undenatured ethyl alcohol of an alcoholic strength by volume of 80 percent or higher; ethyl alcohol and other spirits, denatured,
2207	of any strength
2208	Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80 percent; spirits, liqueurs, and other alcoholic beverages
2303	Residues of starch manufacture and similar residues, beetpulp, bagasse, and other waste of sugar manufacture, brewing or distilling dregs and waste, whether in the form of pellets or not
2304	Oilcake and other solid residues, whether ground or in the form of pellets or not, resulting from the extraction of soybean oil
2309	Preparations of a kind used in animal feeding
2401	Unmanufactured tobacco; tobacco refuse
2402	Cigars, cheroots, cigarillos and cigarettes, of tobacco or of tobacco substitutes
2403	Other manufactured tobacco and manufactured tobacco substitutes; homogenized or reconstituted tobacco; tobacco extracts and essences
5101	Wool, not carded or combed
5201	Cotton, not carded or combed

Source: CEPII (2015).

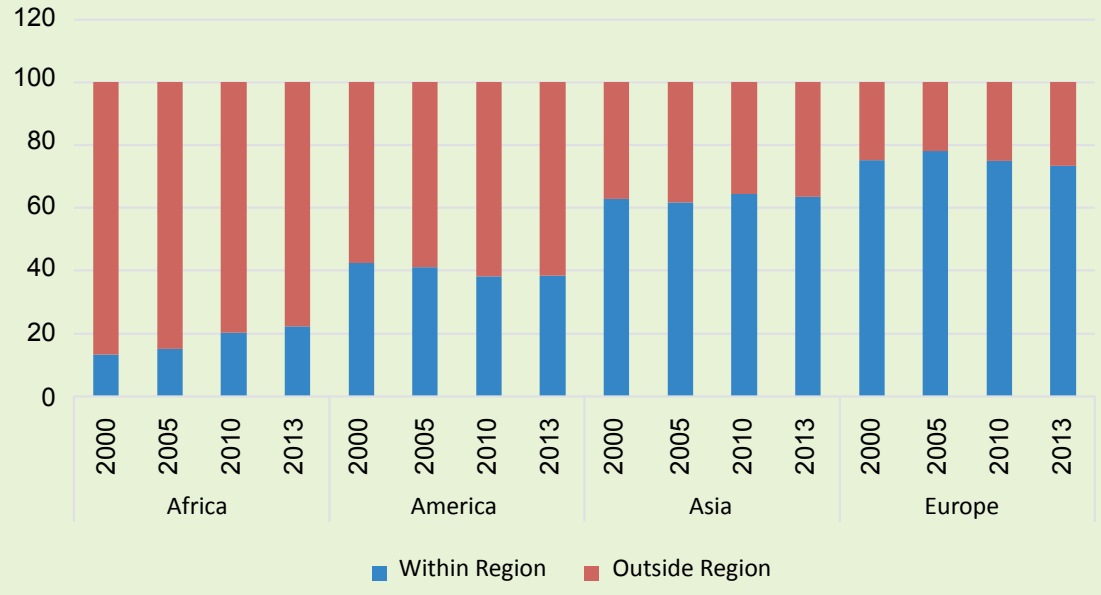
Note: HS = Harmonized System.

3. REGIONAL TRADE PATTERNS ACROSS AFRICA

Anatole Goundan and Cheickh Sadibou Fall

Deepening intra-regional trade among African countries, and especially Africa's main regional economic communities (RECs), is essential in building Africa's resilience to international market shocks. Aware of this reality, African leaders have positioned economic integration as a central issue in almost all African roundtables or political discussions. Important efforts have been made through several regional trade agreements, such as the creation of free trade areas, customs unions, and economic and monetary unions. More recently, the 2012 African Union Summit primarily focused on boosting intra-African trade. Even if those agreements have generally had a positive impact on intra-African trade, trade within the RECs is still very low compared with intra-regional trade elsewhere in the world (see Chapter 2, this volume). For agricultural commodities, trade among African countries as a share of Africa's total trade ranged from 13 to 20 percent during 2000–2013, whereas it generally hovered around 40 percent among North, Central and South American countries, 63 percent among Asian countries, and 75 percent among European countries during the same timeframe (Figure 3.1). Many factors could explain such low levels of intra-regional trade in Africa. Obstacles to increasing performance of intra-regional trade in Africa include weak productive capacity, lack of trade-related infrastructure and services, the limited role of the private sector in regional integration initiatives, low levels of diversification of traded products, the small size of consumer markets, and the quality of institutions (see Chapter 2, this volume).

Figure 3.1. The value of intra-regional agricultural trade as a share of total agricultural trade of world regions, 2000, 2005, 2010, and 2013



Source: Authors' calculations based on CEPII (2015).

Note: Africa, America, Asia, and Europe refer to all countries for which data were available for the selected region. America includes countries of North, Central and South America

This chapter presents an in-depth analysis of the state of intra-African trade in agricultural commodities for the 1998–2013 period. The analysis (a) assesses Africa's current intra-regional trade performance; (b) explores the level and direction of regional trade, the intra-regional trading role of each REC, and each country's contribution to intra-regional trade; (c) examines the main agricultural products traded; and (d) presents the trends in the unit values of imports and exports.

Africa's Overall Trade Performance

During 1998–2013, the export of all goods by African countries to the rest of the world grew rapidly, by an average of 14.6 percent per year (Table 3.1)[5]. Imports of these products from the rest of the world also grew significantly during this period, but to a lesser degree (12.0 percent per year on average). The trends were similar among individual RECs. The countries of the Economic Community of Central African States (ECCAS) recorded the largest average increase of overall exports (21.5 percent) and imports (16.6 percent). Regarding the trade balance, only the countries of the Common Market for Eastern and Southern Africa (COMESA) recorded a negative average trade balance with the rest of the world during 1998–2013; their average normalized trade balance was –10.6 percent.

Agricultural trade among the RECs showed positive average yearly growth during 1998–2013 (Table 3.1). However, for all African countries and each REC, average growth in imports was greater than average growth in exports. Consequently, the normalized trade balance for agricultural products was negative in several cases (Africa, ECCAS, and COMESA). African agricultural exports to the rest of the world represent about 10 percent of their total exports to these destinations.

Table 3.1. Growth in trade between regional economic communities and the rest of the world, 1998–2013

All products (%)				Agricultural products (%)			
Regional economic community	Export Growth	Import Growth	Normalized trade balance	Export Growth	Import Growth	Normalized trade balance	Average agricultural share
ECOWAS	16.5	12.8	7.2	7.2	12.9	1.1	13.1
ECCAS	21.5	16.6	36.3	4.0	16.0	–46.6	2.3
COMESA	14.1	12.3	–10.6	8.3	11.8	–15.3	14.5
SADC	15.0	13.4	8.7	6.3	12.2	19.5	10.4
Africa	14.6	12.0	4.3	7.1	11.5	–10.9	9.8

Source: Authors' calculations based on CEPII (2015).

Note: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community. The average agricultural share (the last column) is calculated as the average share of agricultural products in exports from each regional economic community to the rest of the world during 1998–2013.

[5] Note that the trade data discussed in the section exclude intra-regional trade

Key Exported Commodities across Africa

Exports in Africa are concentrated around very few products (Table 3.2). For example, at the HS4 level[6], the top-5 African export commodities to the rest of the world represent about 62.4 percent of total exports, whereas the top-20 products account for 75.4 percent. In terms of agricultural exports, the composition is less concentrated. In fact, the top-5 agricultural products represent 34.3 percent of total agricultural exports, whereas the top-20 account for 68.6 percent of total agricultural exports. At REC level, results show that, on the whole, both agricultural and total product exports were concentrated.

Table 3.2. Concentration of exports by regional economic communities, 2010–2013

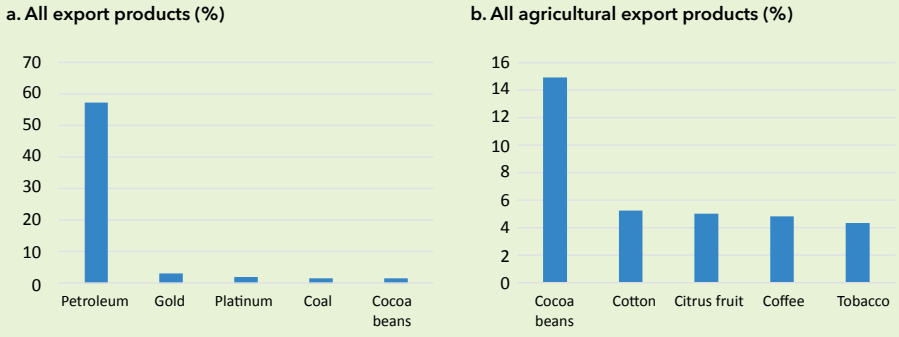
Regional economic community	All products (%)			Agricultural products (%)		
	Top 5	Top 10	Top 20	Top 5	Top 10	Top 20
ECOWAS	83.9	88.7	92.7	71.3	83.9	93.4
ECCAS	90.2	94.1	97.7	80.7	90.7	96.2
COMESA	62.2	68.1	75.3	40.0	58.2	73.0
SADC	48.6	60.9	69.2	40.7	59.8	75.9
Africa	62.4	68.7	75.4	34.3	48.8	68.6

Source: Authors' calculations based on CEPII (2015).

Notes: The concentration of exports is calculated as the top export products' share of total exports at the HS4 level. COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community

The top-five export commodities from Africa during 1998–2013 are reported in Figures 3.2 through 3.6. Both Africa-wide and at the REC level, petroleum was the largest export commodity, with an average share of total exports varying from 28.2 percent for the countries of the Southern African Development Community (SADC) to 87.5 percent for ECCAS countries (Figure 3.2). The other top commodities included gold, platinum, coal, wood, cobalt, natural rubber, aluminum, copper, cotton, coffee, and cocoa beans. The top agricultural commodities were cocoa beans, cotton, bananas and plantains, coffee, tea, sugarcane, and tobacco.

Figure 3.2. The top-five African export products, 1998–2013

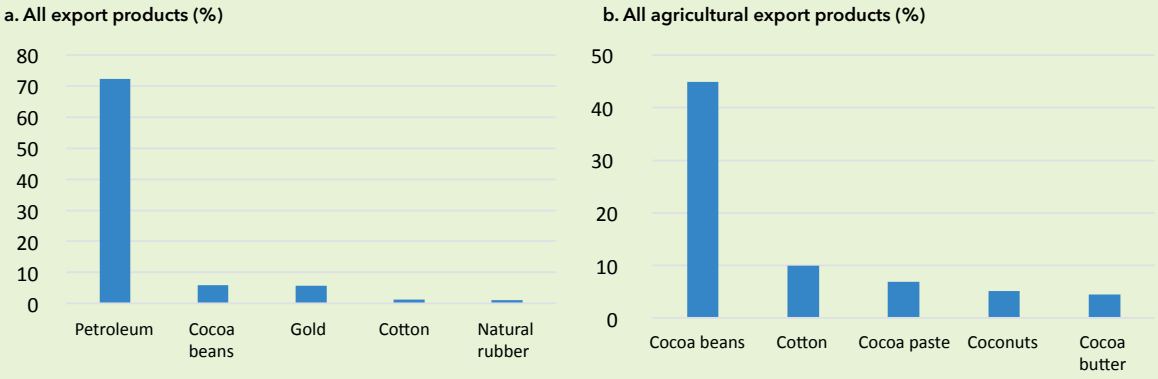


Source: Authors' calculations based on CEPII (2015).

Note: The top-five export products are calculated as their share of total exports; the top-five agricultural export products are calculated as their share of all agricultural exports. "Petroleum" includes three HS4 products: 2709 (petroleum oils and oils obtained from bituminous minerals, crude), 2710 (petroleum gases and other gaseous hydrocarbons), and 2711 (petroleum oils and oils obtained from bituminous minerals, other than crude).

[6] The Harmonized System (HS) is an international nomenclature for the classification of products that allows participating countries to classify traded goods on a common basis for customs purposes.

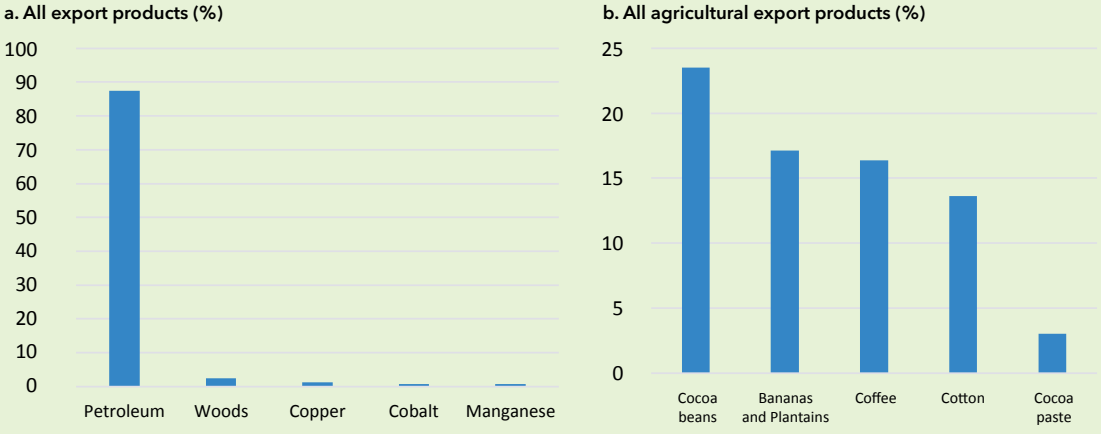
Figure 3.3. The top-five export products from the ECOWAS region, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: The top-five export products are calculated as their share of total exports; the top-five agricultural export products are calculated as their share of all agricultural exports.

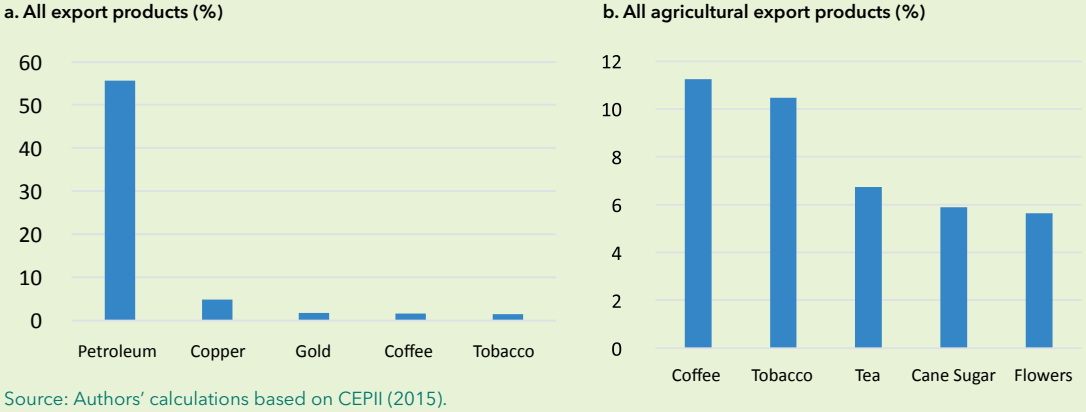
Figure 3.4. The top-five export products from the ECCAS region, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: The top-five export products are calculated as their share of total exports; the top-five agricultural export products are calculated as their share of all agricultural exports.

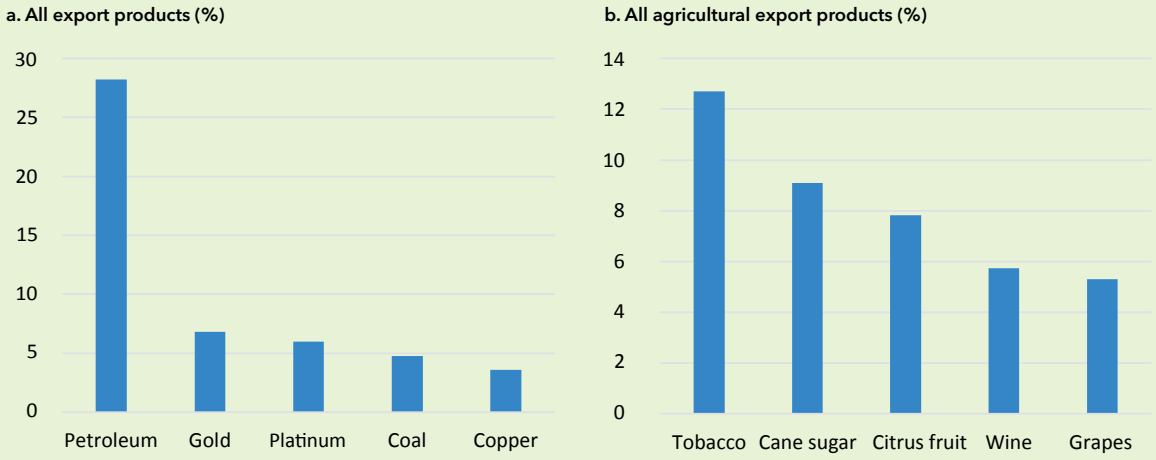
Figure 3.5. The top-five export products from the COMESA region, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: The top-five export products are calculated as their share of total exports; the top-five agricultural export products are calculated as their share of all agricultural exports.

Figure 3.6. Top five export products from the SADC region, 1998–2013



Source: Authors' calculations based on CEPII (2015).

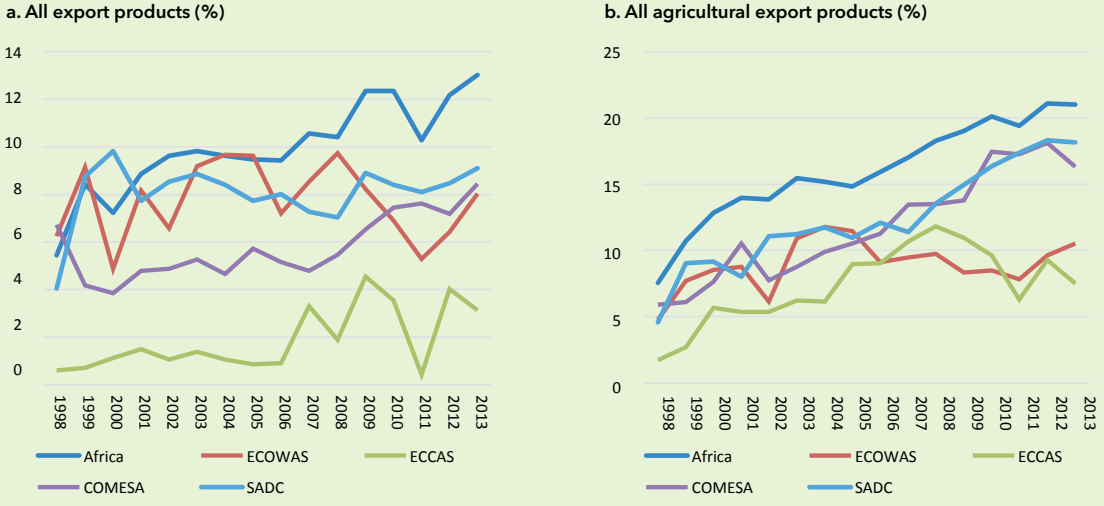
Note: The top-five export products are calculated as their share of total exports; the top-five agricultural export products are calculated as their share of all agricultural exports.

Trends in Africa-Wide and Intra-Regional Agricultural Trade

This section focuses on trends in intra-regional agricultural trade among African countries. Before analyzing trends in the volume and value of trade, the discussion focuses on the evolution of intra-regional trade shares of both agricultural and all commodity exports for each REC (Figure 3.7).[7] Africa-wide, the share of trade within Africa grew throughout the 1998–2013 period. Initially, the shares were around 5 percent for all products and 8 percent for agricultural products, but by the end of the period they reached about 13 and 20 percent, respectively. Results are similar for individual RECs. The SADC region recorded the largest share of intra-regional trade during 1998–2013 (an average of 8.1 percent for all commodities and 12.4 percent for agricultural commodities).

The ECCAS region had the lowest intra-regional trade share for the period, averaging 1.9 percent for all commodities and 7.3 percent for agricultural commodities.

Figure 3.7. Comparative evolution of the share of intra-regional trade across Africa, 1998–2013

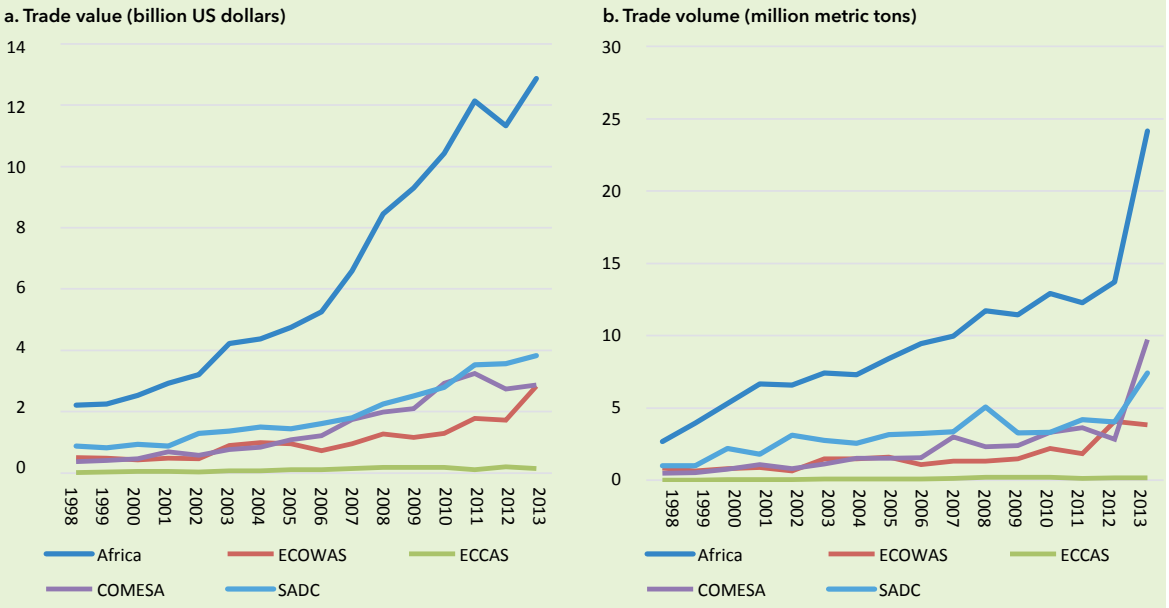


Source: Authors' calculations based on CEPII (2015).

Note: The top-five export products are calculated as their share of total exports; the top-five agricultural export products are calculated as their share of all agricultural exports.

The value of intra-African agricultural trade grew rapidly, from $2.2 billion in 1998 to $12.8 billion in 2013 (Figure 3.8). Overall yearly growth during this period was around 12 percent. Looking at two subperiods—before and after the international crisis—trade in agricultural products increased from 11.5 percent per yearon average during 1998–2006 to 13.6 percent per year during 2007–2013. In terms of volume, trade in agricultural products across Africa grew at an average yearly rate of 15.8 percent for the entire period, which is higher than the nominal trade growth rate, indicating that, in general, growth in agricultural trade among African countries during the selected periods was not accompanied by price increases.

Figure 3.8. Agricultural trade within each regional economic community, 1998–2013

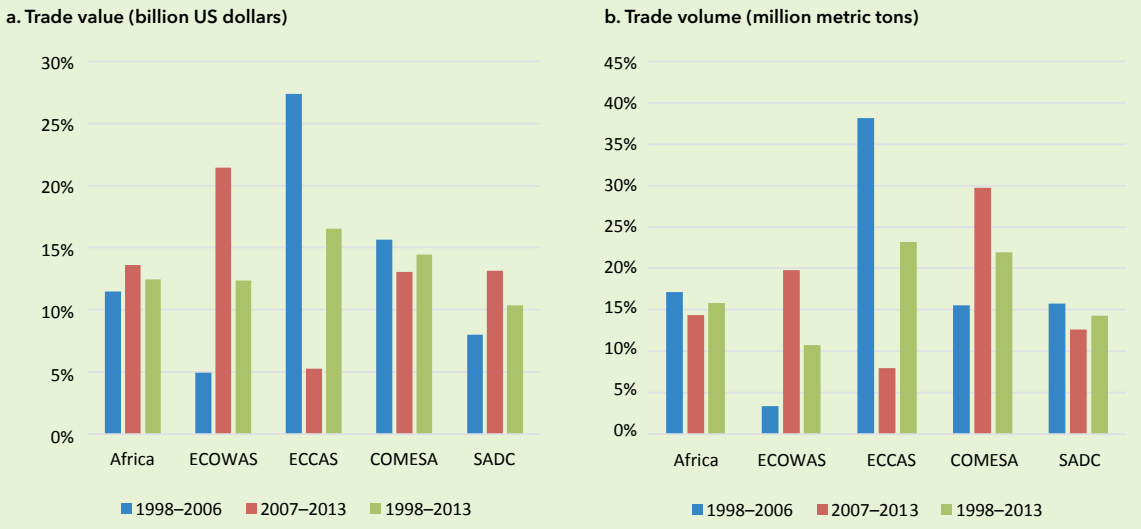


Source: Authors' calculations based on CEPII (2015).

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community.

The value of agricultural trade within the ECOWAS region grew by an average annual rate of 12 percent and hence increased from $494 million in 1998 to $2.84 billion in 2013. Despite this significant growth, however, agricultural trade among ECOWAS countries was highly erratic. In fact, growth was negative in seven years within the considered period. The largest decrease occurred in 2006 (23 percent), and the largest increase in 2003 (95 percent). A large gap in growth occurred over the two subperiods. During 1998–2007, the yearly growth rate averaged 5 percent, whereas it rose to 21 percent during 2007–2013. The agricultural trade volume grew by 11 percent annually overall, compared with 12 percent for nominal trade. Increased trade among the countries of the ECOWAS region was accompanied by a slight rise in commodity prices.

Figure 3.9. Average yearly growth in trade within each regional economic community, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community

Agricultural trade among ECCAS countries exhibited the highest overall growth in terms of value; the yearly growth rate was 17 percent, resulting in an increase from US$14 million in 1998 to $147 million in 2013. Trade within the ECCAS region rose significantly between the two subperiods under study. During 1998–2006, trade within this REC grew by an average of 27 percent, but fell to 5 percent during 2007–2013. Obviously, the 2007/2008 food crisis dampened agricultural trade among ECCAS members. The volume of agricultural trade among these countries followed the same pattern. Moreover, average growth in the volume of trade was higher than average growth in the value of trade. In fact, average growth in trade volume (nominal trade value) among ECCAS countries was 38 percent (27 percent) during 1998–2006, 8 percent (5 percent) during 2007–2013, and 23 percent (17 percent) for the entire period. Consequently, it can be concluded that, on average, trade in agricultural products within ECCAS was not associated with price increases.

As for the other RECs, agricultural trade within the COMESA region grew significantly, from $379 million in 1998 to $2.87 billion in 2013, representing a yearly growth rate of 14 percent. Whereas the ECOWAS and ECCAS regions recorded major differences between the two subperiods, the difference in the rate of growth between the two subperiods was relatively small for the COMESA region (less than 3 percentage points). Across the entire 1998–2013 period, the volume of agricultural trade among COMESA countries rose significantly (by 22 percent overall).

The value of trade in agricultural commodities among SADC countries grew at the lowest yearly rate (10 percent), and the nominal value increased from $871 million in 1998 to $3.82 billion in 2013. During 1998–2006, the value of agricultural trade rose by 8 percent per year, compared with 13 percent during 20007–2013. In terms of value, agricultural trade within the SADC region rose after the international food crisis, but the trends in the volume of trade differ between the two subperiods. The average increase in trade volume was higher during 1998–2006 (16 percent) compared with 2007–2013 (13 percent). Hence, the nominal increase in trade among SADC countries was essentially the result of a price effect. Nevertheless, for the entire 1998–2013 period, the volume of intra-regional trade grew by 14 percent, which is higher than growth in terms of value (10 percent).

The Direction of Agricultural Trade within African and Intra-Regional Markets

The focus of this section is an examination of which RECs and countries had the highest intra-regional trade performance during 1998–2013. To begin, the average value of regional imports and exports during 2010–2013 is presented (Table 3.3).

Table 3.3. Value of trade in agricultural products within and across Africa by region, 2010–2013 average

Exporting region	Importing region					
	Africa	ECOWAS	ECCAS	COMESA	SADC	SSA
	US dollars (billions)					
Africa	11.69	2.93	1.73	5.26	4.07	9.53
ECOWAS	2.40	1.91	0.13	0.06	0.09	2.13
ECCAS	0.30	0.01	0.16	0.15	0.08	0.27
COMESA	4.50	0.10	0.54	2.94	1.67	3.39
SADC	4.46	0.30	0.96	2.60	3.43	4.29
SSA	9.28	2.47	1.53	4.09	3.91	8.39

Source: Authors' calculations based on CEPII (2015).

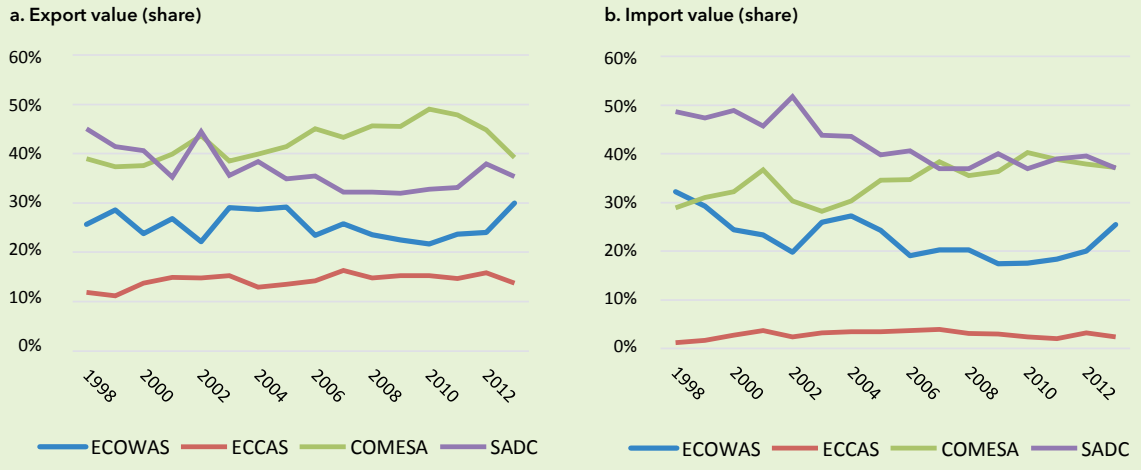
Notes: Intra-regional trade is indicated by the values shown in bold font and shading. COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States;
ECOWAS = Economic Community of West African States; SADC = the Southern African Development Community; and SSA = Africa south of the Sahara.

One interesting statistic is the ratio of trade within each of the four RECs to the total trade of each REC within Africa as a whole. This shows how one REC's trade across Africa is concentrated in that REC; it can be seen as an indicator of participation in intra-African trade. Simply put, the lower the ratio, the more the REC under consideration contributes to intra-African integration. Results show that ECOWAS had the highest concentration of trade within the REC during 2010–2013, with a ratio of 0.79, followed by SADC with 0.77, COMESA with 0.65, and finally ECCAS with 0.52. Therefore, ECCAS member countries contribute the most to trade integration within Africa, followed by COMESA. To a larger extent, SADC and ECOWAS tend to trade within their respective blocs. For example, ECOWAS's intra-regional agricultural trade represented around 80 percent of its total trade within Africa during 2010–2013, on average.

As destinations or origins of intra-African trade, COMESA (42 percent of exports and 34 percent of imports) and SADC (37 percent of exports and 42 percent of imports) are the dominant regions, whereas ECCAS (14 percent of exports and 3 percent of imports) ranks last (Figure 3.10).

Notably, the patterns for COMESA and SADC are opposite. In fact, COMESA gained in its share of both imports and exports over the considered period, whereas SADC countries lost ground. COMESA's export share rose from an average of 40 percent during 1998–2006 to 45 percent during 2007–2013, and the region's import share rose from an average of 32 percent during 1998–2006 to 37 percent during 2007–2013. In contrast, SADC's export share fell from an average of 39 percent during 1998–2006 to 34 percent during 2007–2013, and the region's import share fell from an average of 46 percent during 1998–2006 to 38 percent during 2007–2013.

Figure 3.10. Regional shares of agricultural trade within Africa, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community. Shares sum to greater than 100 percent due to the membership of some countries in multiple RECs.

Many initiatives and political commitments exist within RECs to promote political cooperation and economic integration. As demonstrated, those commitments led to higher levels of intra-regional trade over time. The objective of the following analyses is to highlight the importance of different countries' imports and exports within their REC. Individual countries' shares in intra-regional imports and exports are presented in Tables 3.4 through 3.7.

Table 3.4. Share of agricultural trade within the ECOWAS region by country, 1998–2006, 2007–2013, and 1998–2013

Country	1998–2006		2007–2013		1998–2013	
	Exports (%)	Imports (%)	Exports (%)	Imports (%)	Exports (%)	Imports (%)
Benin	6.3	5.5	5.9	3.9	6.0	4.5
Burkina Faso	**14.8**	7.7	4.2	**10.2**	7.9	9.3
Cabo Verde	0.1	0.1	0.1	0.2	0.1	0.2
Côte d'Ivoire	**25.0**	**15.3**	**26.8**	**12.5**	**26.2**	**13.5**
Gambia	0.5	1.5	1.0	1.5	0.8	1.5
Ghana	3.7	**10.3**	**11.1**	8.9	8.5	9.3
Guinea	2.6	2.2	2.0	2.8	2.2	2.6
Guinea-Bissau	0.1	1.1	1.0	0.8	0.7	0.9
Liberia	0.1	0.4	0.1	0.7	0.1	0.6
Mali	**17.7**	8.4	6.0	9.7	**10.1**	9.3
Niger	**10.9**	8.5	**17.9**	5.8	**15.5**	6.7
Nigeria	3.0	**14.8**	6.9	**27.6**	5.5	**23.1**
Senegal	8.8	**12.2**	**12.6**	9.2	**11.3**	**10.2**
Sierra Leone	0.0	0.3	0.0	0.7	0.0	0.5
Togo	6.3	11.7	4.2	5.6	4.9	7.7

Source: Authors' calculations based on CEPII (2015).

Note: ECOWAS = Economic Community of West African States.

Within ECOWAS, Côte d'Ivoire remains the largest exporter of agricultural products, with about 26 percent of intra-regional trade in agricultural commodities. Other important exporters within ECOWAS are Niger (15.5 percent), Senegal (11.3 percent), and Mali (10.1 percent). In terms of destination, Nigeria is the main importer of these commodities (23.1 percent of total intra-regional trade), followed by Côte d'Ivoire (13.5 percent) and Senegal (10.2 percent). The export performance of some countries deteriorated over time, whereas for other countries it improved. For example, Burkina Faso's export share fell from 14.8 to 4.2 percent between 1998–2006 and 2007–2013, whereas Ghana's export share rose from 3.7 to 11.1 percent between the two subperiods.

Table 3.5. Share of agricultural trade within the ECCAS region by country, 1998–2006, 2007–2013, and 1998–2013

	1998–2006		2007–2013		1998–2013	
Country	Exports (%)	Imports (%)	Exports (%)	Imports (%)	Exports (%)	Imports (%)
Angola	0.6	1.2	0.1	3.2	0.2	2.5
Burundi	2.0	0.8	2.2	3.9	2.2	3.5
Cameroon	**50.5**	**20.8**	**41.5**	**11.7**	**42.7**	**14.4**
Central African Republic	1.6	10.9	0.4	8.6	0.8	9.2
Chad	4.1	11.6	0.1	8.6	1.3	9.7
Republic of the Congo	**16.9**	**18.7**	**11.7**	**18.7**	**13.1**	**18.5**
Democratic Republic of the Congo	0.5	5.2	4.9	21.0	3.4	15.9
Equatorial Guinea	0.1	6.5	0.0	7.1	0.0	7.0
Gabon	**22.3**	**21.5**	**17.1**	**13.3**	**18.0**	**15.7**
Rwanda	1.2	1.8	22.0	3.2	18.1	3.0
São Tomé and Príncipe	0.2	0.9	0.1	0.6	0.1	0.7

Source: Authors' calculations based on CEPII (2015).

Notes: ECCAS = the Economic Community of Central African States.

Among ECCAS member countries, Cameroon recorded the highest share of intra-regional agricultural exports during 1998–2013 (around 43 percent), followed by Rwanda (18.1 percent), Gabon (18.0 percent), and the Republic of the Congo (13.1 percent). In terms of destination, the Republic of the Congo (18.5 percent), the Democratic Republic of the Congo (15.9 percent), Gabon (15.7 percent), and Cameroon (14.4 percent) were the main importing markets for agricultural products. It is worth noting the impressive performance of Rwanda, whose export share rose from 1.2 percent during 1998–2006 to 18.1 percent during 2007–2013 on average.

Table 3.6. Share of agricultural trade within the COMESA region by country, 1998–2006, 2007–2013, and 1998–2013

Country	1998–2006		2007–2013		1998–2013	
	Exports (%)	Imports (%)	Exports (%)	Imports (%)	Exports (%)	Imports (%)
Burundi	0.4	1.4	0.4	1.6	0.4	1.6
Comoros	0.0	0.6	0.1	0.3	0.1	0.4
Democratic Republic of the Congo	0.7	6.8	0.4	9.8	0.5	9.2
Djibouti	2.0	5.8	0.8	3.2	1.2	4.0
Egypt	5.6	22.6	21.1	14.3	17.0	**16.6**
Eritrea	0.0	0.8	0.1	1.1	0.1	1.0
Ethiopia	7.4	4.0	7.2	1.2	7.2	2.0
Kenya	**28.0**	**13.2**	**21.1**	**11.6**	**22.9**	**12.2**
Libya	0.0	0.2	0.1	10.2	0.1	8.3
Madagascar	1.3	2.5	0.7	2.5	0.8	2.5
Malawi	5.8	4.7	5.0	3.1	5.2	3.6
Mauritius	2.7	4.1	2.4	4.8	2.5	4.7
Rwanda	2.2	3.3	3.2	4.0	3.0	3.9
Seychelles	2.2	0.6	1.3	0.3	1.6	0.4
Sudan	6.4	**11.9**	2.6	**16.6**	3.5	**13.7**
Uganda	**13.5**	4.9	**15.5**	4.7	**15.0**	4.9
Zambia	**11.9**	6.8	**15.5**	3.0	**14.6**	4.0
Zimbabwe	9.9	5.6	2.3	7.6	4.3	7.2

Source: Authors' calculations based on CEPII (2015).

Notes: COMESA = the Common Market for Eastern and Southern Africa

Within the COMESA region, Kenya (22.9 percent), Egypt (17.0 percent), Uganda (15.0 percent), and Zambia (14.6 percent) were the leading exporters of agricultural products during 1998–2013 on average. In terms of imports, Egypt (16.6 percent), Sudan (13.7 percent), and Kenya (12.2 percent) were the main markets for those products. Showing exceptional performance, Egypt's export share increased fourfold, rising from 5.6 percent during 1998–2006 to 21.1 percent during 2007–2013.

Table 3.7. Share of agricultural trade within the SADC region by country, 1998–2006, 2007–2013, and 1998–2013

Country	1998–2006		2007–2013		1998–2013	
	Exports (%)	Imports (%)	Exports (%)	Imports (%)	Exports (%)	Imports (%)
Angola	0.2	15.1	0.1	11.4	0.1	12.5
Democratic Republic of the Congo	0.1	6.5	0.0	10.7	0.0	9.5
Madagascar	0.8	2.6	0.4	2.7	0.5	2.7
Malawi	4.0	8.1	5.1	5.5	4.7	6.3
Mauritius	1.5	7.7	2.3	6.5	2.0	6.9
Mozambique	4.8	13.3	5.0	13.6	4.9	13.5
SACU	59.9	18.3	57.0	12.6	57.8	14.3
Seychelles	1.2	0.9	1.3	0.6	1.2	0.7
Tanzania	2.1	3.9	3.8	2.9	3.3	3.2
Zambia	10.1	9.6	16.0	8.4	14.2	8.8
Zimbabwe	15.5	13.9	9.2	25.0	11.0	21.7

Source: Authors' calculations based on CEPII (2015).

Notes: SADC = the Southern African Development Community

Within SADC, the countries of the Southern African Customs Union (SACU)—which comprise Botswana, Lesotho, Namibia, Swaziland, and South Africa—constituted the major exporters, with around 57 percent of intra-regional trade in agricultural commodities. In terms of imports, SACU countries were the second-largest market (14.3 percent) behind Zimbabwe (21.7 percent). Mozambique was the third-largest market for this region's agricultural products, accounting for 13.5 percent of intra-regional trade during 1998–2013.

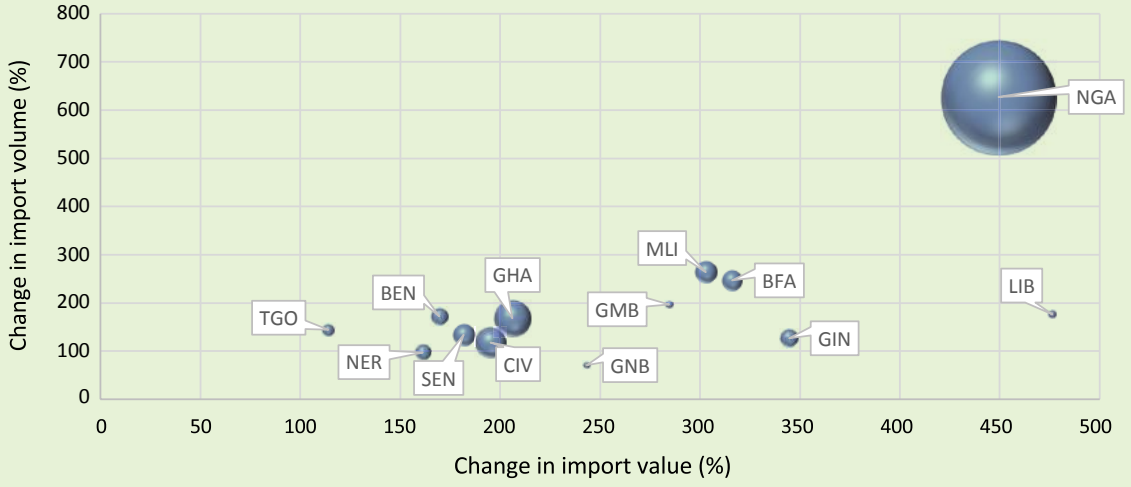
Changes in Exports and Imports in Intra-African and Intra-Regional Agricultural Markets

The next sections present results on changes in the value and volume of imports and exports between 1998–2006 and 2007–2013. In Figures 3.11 through 3.18, the rate of growth in the average value of trade between the two subperiods is represented on the x axis. The rate of growth of the average volume of trade between the two subperiods is represented on the y axis. Each circle represents a country, and the size of the circle indicates the country's average GDP during 2007–2013. This type of graph was chosen to capture whether the observed changes in trade stem from a price effect or a volume effect. In addition, the graphs provide an indication of the size of the national economies within each REC.

Economic Community of West African States

In the aggregate, the value and volume of intra-regional trade among ECOWAS countries more than doubled between the subperiods. At the country level, the value of imports at least doubled between the two subperiods for all countries (Figure 3.11). In terms of volume, all the countries of the ECOWAS region increased the quantity of their agricultural imports from within their REC, at least doubling imports in most cases. Between the two subperiods, the largest increases in imports occurred in Cabo Verde (not shown), Sierra Leone (not shown), Nigeria, Liberia, Burkina Faso, and Mali.

Figure 3.11. Changes in agricultural imports within the ECOWAS region, 1998–2006 to 2007–2013

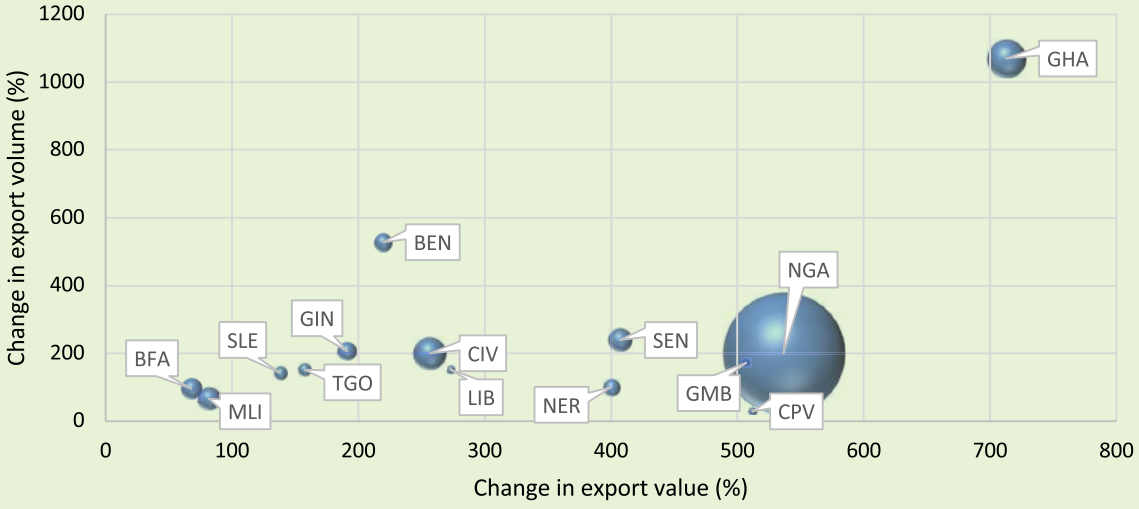


Source: Authors' calculations based on CEPII (2015).

Notes: ECOWAS = Economic Community of West African States. BEN = Benin, BFA = Burkina Faso, CIV = Côte d'Ivoire, GMB = Gambia, GHA = Ghana, GIN = Guinea, GNB = Guinea-Bissau, LIB = Liberia, MLI = Mali, NER = Niger, NGA = Nigeria, SEN = Senegal, and TGO = Togo. The x axis represents the change in the average agricultural import value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural import volume between the two subperiods.
The size of each circle represents the country's average GDP during the second subperiod. Cabo Verde and Sierra Leone are omitted from the graph due to very high values.

On the export side, other than Burkina Faso, Mali, and Cabo Verde, the other countries at least doubled their value and volume of average agricultural exports within the ECOWAS region (Figure 3.12). Guinea-Bissau (not shown) experienced sharp increases of over 1,000 percent in the value and volume of its exports, due to low levels during the first period. Ghana experienced the next-largest growth in exports, with an increase of over 700 percent in terms of value and over 1,000 percent in terms of volume. Nigeria, Cabo Verde, and Gambia also showed export value growth of over 500 percent, and Benin registered similar growth in terms of export volume.

Figure 3.12. Changes in agricultural exports within the ECOWAS region, 1998–2006 to 2007–2013



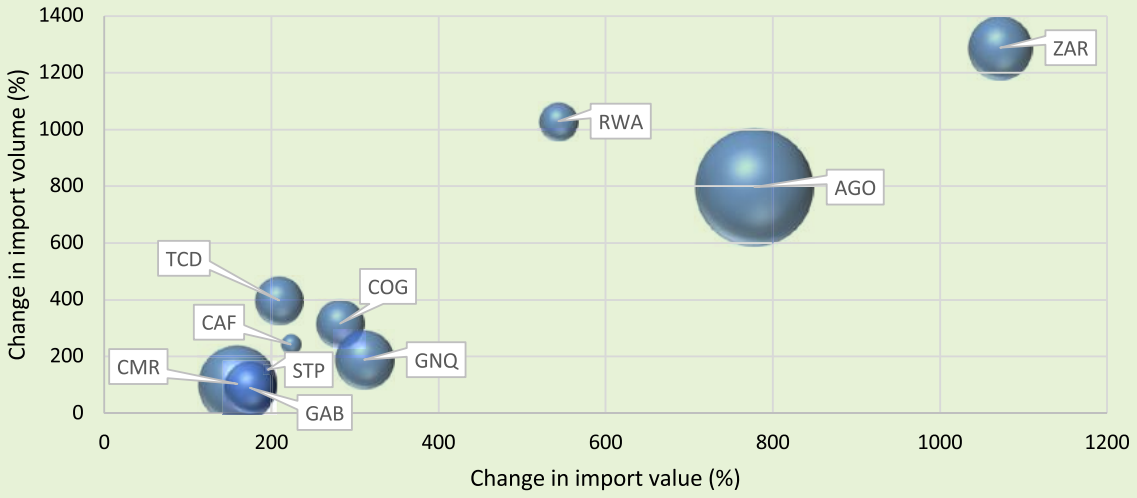
Source: Authors' calculations based on CEPII (2015).

Note: ECOWAS = Economic Community of West African States. BEN = Benin, BFA = Burkina Faso, CPV = Cabo Verde, CIV = Côte d'Ivoire, GMB = Gambia, GHA = Ghana, GIN = Guinea, LIB = Liberia, MLI = Mali, NER = Niger, NGA = Nigeria, SEN = Senegal, SLE = Sierra Leone, and TGO = Togo. The x axis represents the change in the average agricultural export value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural export volume between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod. Guinea-Bissau is omitted from the graph due to very high values

Economic Community of West African States

Average aggregate agricultural trade within the ECCAS region more than doubled in terms of both value and volume between the two subperiods. Without exception, all the countries in the region increased their volume and value of intra-regional agricultural imports (Figure 3.13). Burundi (not shown) recorded the highest increase in agricultural imports from within ECCAS between the two subperiods, followed by Democratic Republic of the Congo, Rwanda and Angola.

Figure 3.13. Changes in agricultural imports within the ECCAS region, 1998–2006 to 2007–2013

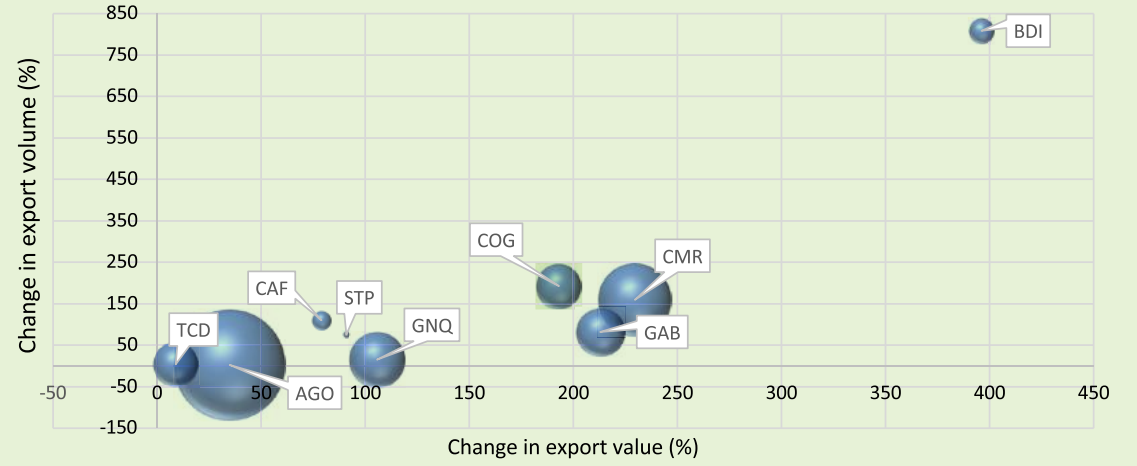


Source: Authors' calculations based on CEPII (2015).

Note: ECCAS = the Economic Community of Central African States; AGO = Angola, CMR = Cameroon, CAF = Central African Republic, TCD =Chad, COG = Republic of the Congo, ZAR = Democratic Republic of the Congo, GNQ = Equatorial Guinea, GAB = Gabon, RWA = Rwanda, and STP = São Tomé and Príncipe. The x axis represents the change in the average agricultural import value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural import volume between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod. Burundi is omitted from the graph due to very high values.

Burundi experienced impressive growth in terms of both the value and the volume of its intra-regional agricultural exports (Figure 3.14). In fact, Burundi's exports rose by 396 percent in value and by 809 percent in volume, on average, between 1998–2006 and 2007–2013. This performance was surpassed only by Democratic Republic of the Congo and Rwanda (not shown), which both increased their export value and volume by over 2,000 percent. All ECCAS countries showed growth in intra-regional exports between the two periods, with the most modest growth, of less than 50 percent in terms of both value and volume, in Angola and Chad.

Figure 3.14. Changes in agricultural exports within the ECCAS region, 1998–2006 to 2007–2013



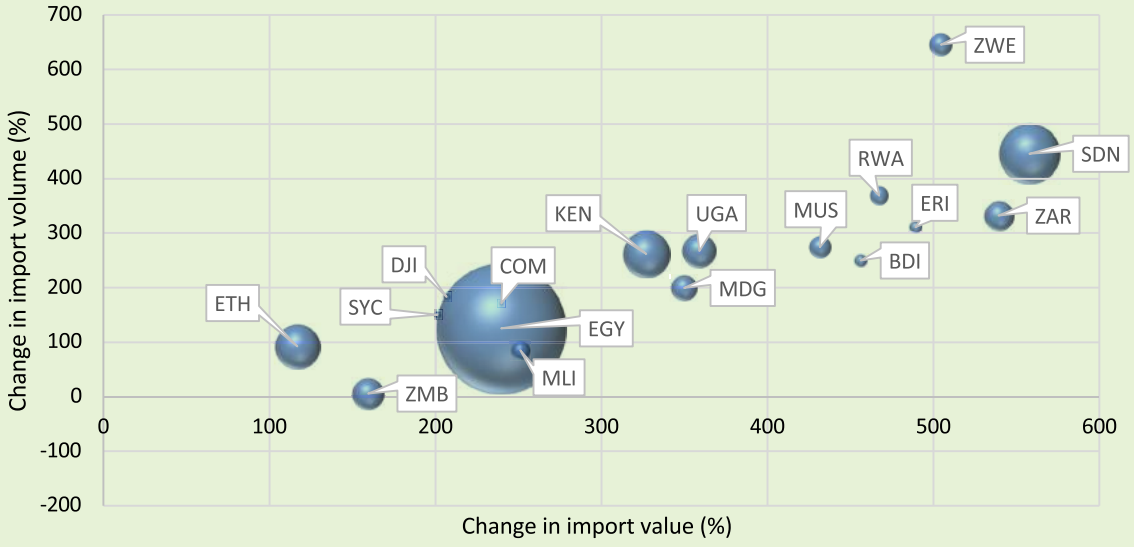
Source: Authors' calculations based on CEPII (2015).

Note: ECCAS = the Economic Community of Central African States; AGO = Angola, BDI = Burundi, CMR = Cameroon, CAF = Central African Republic, TCD =Chad, COG = Republic of the Congo, GNQ = Equatorial Guinea, GAB = Gabon, and STP = São Tomé and Príncipe. The x axis represents the change in the average agricultural export value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural export volume between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod. Rwanda and Democratic Republic of the Congo are omitted from the graph due to very high values.

The Common Market for Eastern and Southern Africa

In the aggregate, agricultural trade within the COMESA region intensified over time, more than tripling in terms of both value and volume. All countries in the region at least doubled the value of their agricultural imports from their neighboring countries (Figure 3.15). Most countries doubled import volumes as well, with the exception of Ethiopia, Malawi, and Zambia. Libya (not shown) was an outlier with exceptional growth in import value and volume, due to very low imports during the first period; the next highest growth in intra-regional agricultural imports was seen in Sudan, which increased its import value more than sixfold, and in Zimbabwe, which increased its import volume more than sevenfold.

Figure 3.15. Changes in agricultural imports within the COMESA region, 1998–2006 to 2007–2013

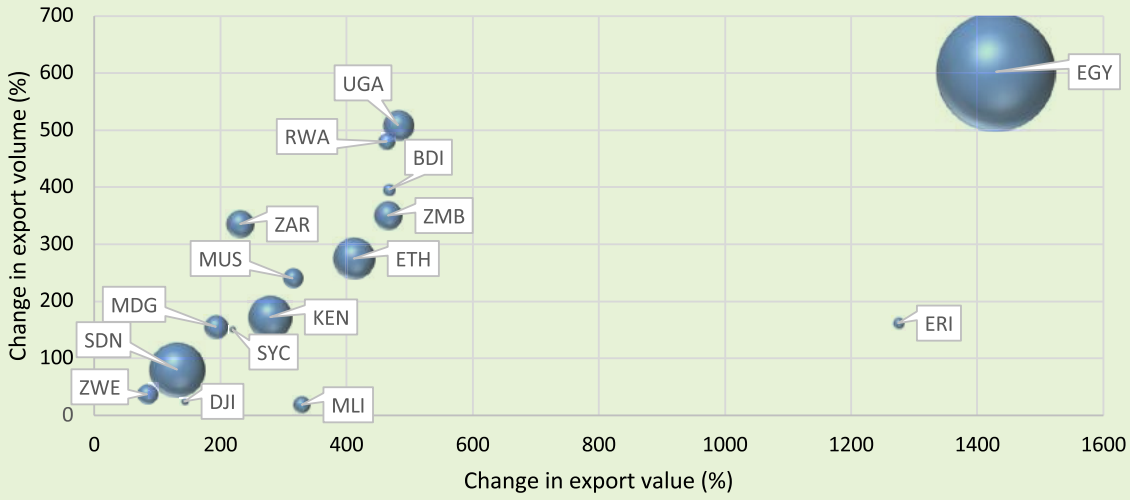


Source: Authors' calculations based on CEPII (2015).

Note: COMESA = The Common Market for Eastern and Southern Africa; BDI = Burundi, COM = Comoros, ZAR = Democratic Republic of the Congo, DJI = Djibouti, EGY = Egypt, ERI = Eritrea, ETH = Ethiopia, KEN = Kenya, MDG = Madagascar, MWI = Malawi, MUS = Mauritius, RWA = Rwanda, SYC = Seychelles, SDN = Sudan, UGA = Uganda, ZMB = Zambia, ZWE = Zimbabwe. The x axis represents the change in the average agricultural import value share between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural import volume share between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod. Libya is omitted from the graph due to very high values.

All of the COMESA region's countries saw positive growth in intra-regional exports (Figure 3.16), and most countries at least doubled their sales of agricultural commodities in terms of both volume and value, with the exception of Djibouti, Sudan, and Zimbabwe. In Djibouti and Sudan, values doubled, but quantities increased more modestly; in Zimbabwe, import value and volume increased by 84 and 37 percent, respectively. In contrast, intra-regional agricultural trade grew fifteenfold in Egypt in terms of value, such that it became the region's largest exporter of agricultural products within COMESA, ahead of Kenya, Uganda, and Zambia. Libya (not shown) experienced extremely high percentage growth due to low levels of exports during the first period. Eritrea also showed a very large increase in its export value, while Rwanda and Uganda increased both their value and volume of exports within the region by around sixfold. Compared with the ECCAS region, the countries of the COMESA region trade more within their REC.

Figure 3.16. Changes in agricultural exports within the COMESA region, 1998–2006 to 2007–2013



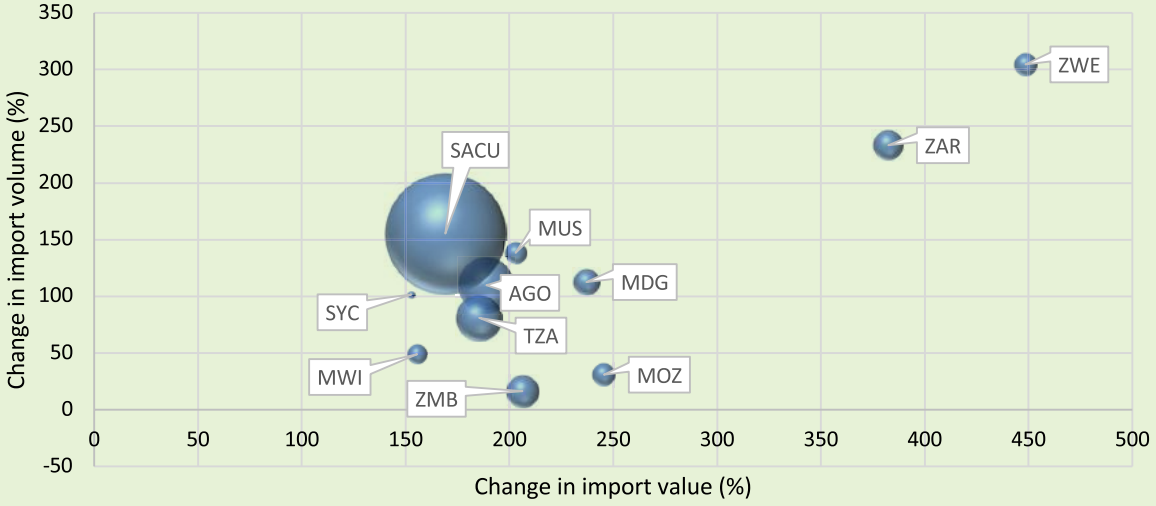
Source: Authors' calculations based on CEPII (2015).

Note: COMESA = The Common Market for Eastern and Southern Africa; BDI = Burundi, COM = Comoros, ZAR = Democratic Republic of the Congo, DJI = Djibouti, EGY = Egypt, ERI = Eritrea, ETH = Ethiopia, KEN = Kenya, MDG = Madagascar, MWI = Malawi, MUS = Mauritius, RWA = Rwanda, SYC = Seychelles, SDN = Sudan, UGA = Uganda, ZMB = Zambia, ZWE = Zimbabwe. The x axis represents the change in the average agricultural export value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural export volume between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod. Libya is omitted from the graph due to very high values.

The Southern African Development Community

In the aggregate, trade within the SADC region more than doubled in terms of value and nearly doubled in terms of volume between 1998–2006 and 2007–2013 (Figures 3.17 and 3.18). It should be noted, however, that the BACI database (CEPII 2015) groups data for South Africa, Namibia, Botswana, Swaziland, and Lesotho within SACU, so data were not available for these individual countries. All SADC countries for which data were available at least doubled the value of their agricultural imports from within the region. All countries experienced positive growth in import volume, and most countries increased import volume by at least 50 percent. The largest increases in agricultural imports occurred in the Democratic Republic of the Congo, where the value rose by 382 percent and the volume by 233 percent, and in Zimbabwe, where the value increased by 449 percent and the volume increased by 305 percent.

Figure 3.17. Changes in agricultural imports within the SADC region, 1998–2006 to 2007–2013

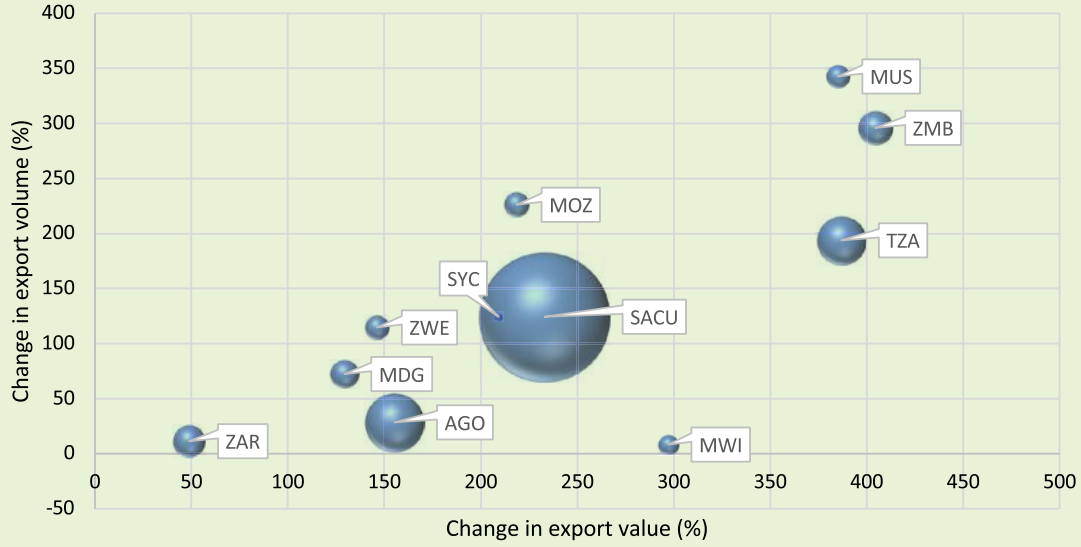


Source: Authors' calculations based on CEPII (2015).

Note: SADC = the Southern African Development Community; AGO = Angola, ZAR = Democratic Republic of the Congo, MDG = Madagascar, MLI = Malawi, MUS = Mauritius, MOZ = Mozambique, SACU = Southern African Customs Union, SYC = Seychelles, TZA = United Rep. of Tanzania, ZMB = Zambia, and ZWE = Zimbabwe. The x axis represents the change in the average agricultural import value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural import volume between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod.

In terms of exports to destinations within the SADC region, Zambia and Mauritius recorded the highest increases (Figure 3.18). In addition, the value and volume of exports within the region rose for all countries between 1998–2006 and 2007–2013, with all countries except Democratic Republic of the Congo at least doubling the value of their intra-regional agricultural exports. In terms of volume, all countries except Angola, Democratic Republic of the Congo, Madagascar, and Malawi doubled their agricultural exports between the two subperiods.

Figure 3.18. Changes in agricultural exports within the SADC region, 1998–2006 to 2007–2013



Source: Authors' calculations based on CEPII (2015).

Note: SADC = the Southern African Development Community; AGO = Angola, ZAR = Democratic Republic of the Congo, MDG = Madagascar, MWI = Malawi, MUS = Mauritius, MOZ= Mozambique, SACU = Southern African Customs Union, SYC = Seychelles, TZA = United Rep. of Tanzania, ZAM = Zambia, and ZWE = Zimbabwe. The x axis represents the change in the average agricultural export value between 1998–2006 and 2007–2013. The y axis shows the change in the average agricultural export volume between the two subperiods. The size of each circle represents the country's average GDP during the second subperiod.

Changes in the Composition of Africa-wide and Intra-Regional Agricultural Trade

The discussion of trade composition in this section focuses both on groups of products, in efforts to provide a better overview, as well as a comparison of the ranking of individual traded commodities between the two subperiods under consideration, 1998–2006 and 2007–2013 (Table 3.6). In the aggregate, cereals maintained a relatively stable share of trade among African countries over time, at around 7 percent. Shares of dairy products and other livestock products, fruits and processed food all increased between the two periods. In contrast, trade in coffee and oilseeds fell slightly over time.

Table 3.8. Changes in the composition of trade in agricultural commodities within Africa by group, 1998–2006 to 2007–2013

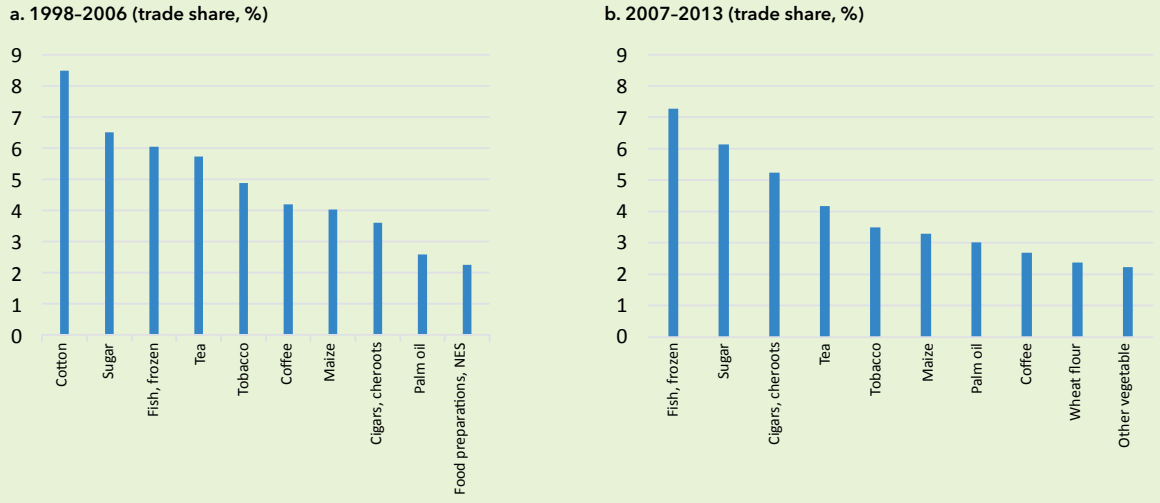
Commodity group	Africa		ECOWAS		ECCAS		COMESA		SADC	
	1998-2006 (%)	2007-2013 (%)	1998-2006 (%)	2007-2013 (%)	1998-2006 (%)	2007-2013 (%)	1998-2006 (%)	2007-2013 (%)	1998-2006 (%)	1998-2006 (%)
Cereals	6.9	6.6	3.9	4.8	0.6	4.2	7.0	8.7	11.8	11.8
Coffee	10.4	7.4	0.4	1.5	0.9	0.5	27.4	17.0	2.8	2.8
Dairy products	2.8	3.5	3.3	2.9	1.9	3.7	1.5	4.4	3.7	3.7
Fish products	7.5	8.2	6.4	7.4	1.0	1.3	3.1	2.1	5.5	5.5
Fruit	2.5	3.3	2.7	2.4	0.1	0.2	1.2	1.1	2.8	2.8
Live cattle	2.8	3.0	10.5	8.8	1.3	3.5	1.6	3.7	1.3	1.3
Meat	0.8	0.8	0.7	1.6	0.2	0.2	0.6	0.2	1.6	1.6
Oilseeds	2.7	2.5	2.2	1.9	0.8	0.2	4.5	2.9	2.8	2.8
Processed food	38.5	41.8	27.5	46.3	75.5	66.2	30.3	37.3	45.5	45.5
Other	25.0	22.8	42.4	22.5	17.6	19.8	22.9	22.5	22.3	22.3
Total	100	100	100	100	100	100	100	100	100	100

Source: Authors' calculations based on CEPII (2015).

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community.

The composition of individually traded agricultural products across Africa did not change significantly between the two subperiods under consideration (Figure 3.19). Indeed, only two products present in the top-10 during 1998–2006—cotton and food preparation items not specified elsewhere—were not also present in the 2007–2013 ranking; these products were replaced in the more recent subperiod by vegetables and wheat flour. Notably, between the two subperiods, frozen fish products rose from third to first place in the top-10 ranking. The next subsections deal with the changes in individual commodity rankings with each REC.

Figure 3.19. The top-10 traded agricultural commodities within Africa, 1998–2006 and 2007–2013

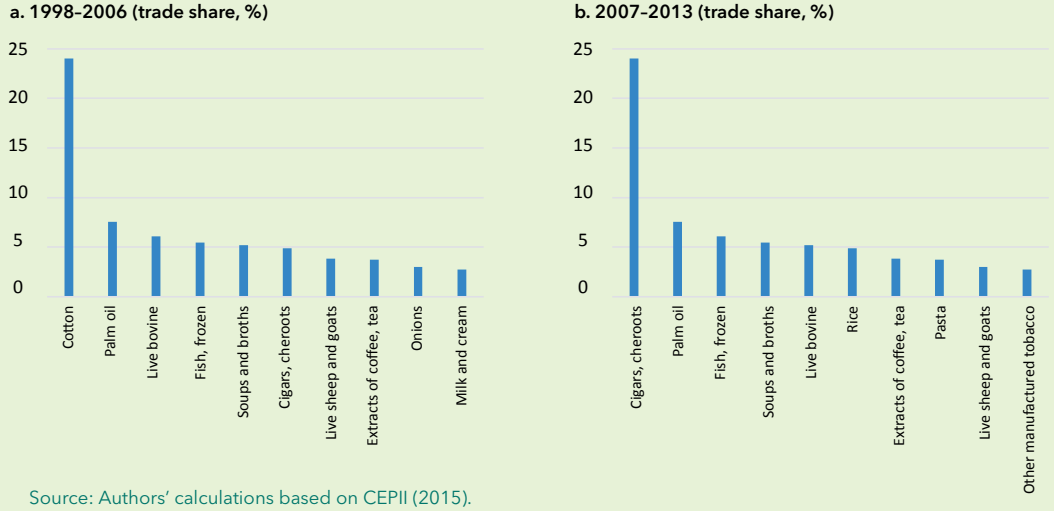


Source: Authors' calculations based on CEPII (2015).
Note: NES = not elsewhere specified.

The Economic Community of West African States

In terms of commodity groupings, ECOWAS member countries increased their trade in cereals, coffee, frozen fish products, dairy products, meat, and processed food within the region over time (Table 3.8). With an increase of almost 20 percentage points between 1998–2006 and 2007–2013, processed food accounted for almost the half the intra-regional trade in the more recent subperiod. Following the trend for Africa as a whole, cotton was the most-traded commodity within the ECOWAS region during 1998–2006 (25 percent), but it fell off the top-10 list in 2007–2013 (Figure 3.20). In contrast, trade in cigars and cheroots quadrupled over time. Trade in palm oil and frozen fish products also increased over time, but to a lesser extent. In addition, rice and pasta were among the top-10 ranking of traded commodities within the ECOWAS region during 2007–2013, not having appeared on the earlier list. In the case of rice, this was likely a response to the rice self-sufficiency policies launched by many ECOWAS countries to cope with the 2007–2008 food price crisis.

Figure 3.20. The top-10 traded agricultural commodities in the ECOWAS region, 1998–2006 and 2007–2013



Source: Authors' calculations based on CEPII (2015).
Note: ECOWAS = Econo,ic Community of West African States.

The Economic Community of Central African States

Within the ECCAS region, processed foods accounted for about two-thirds of total agricultural trade in both subperiods, despite an approximate nine-point decline in the share of this group of products between the two subperiods (Table 3.8). Cereals and fish products were the other most traded groups of commodities.

Sugar remained the most-traded agricultural product among ECCAS member countries in both subperiods under consideration, although its share declined during 2007–2013 (Figure 3.21). Overall, the composition of trade in the ECCAS region changed very little, but a declining trend was noted for those products appearing in the top-10 ranking in both subperiods—for example, trade in cigars and cheroots fell by half between the two subperiods. In terms of newly traded products, wheat flour, sauces, and milk and cream were among the top-10 traded products during the second subperiod.

Figure 3.21. The top-10 traded agricultural commodities in the ECCAS region, 1998–2006 and 2007–2013

Source: Authors' calculations based on CEPII (2015).

Note: ECCAS = Economic Community of Central African States; NES = not elsewhere specified.

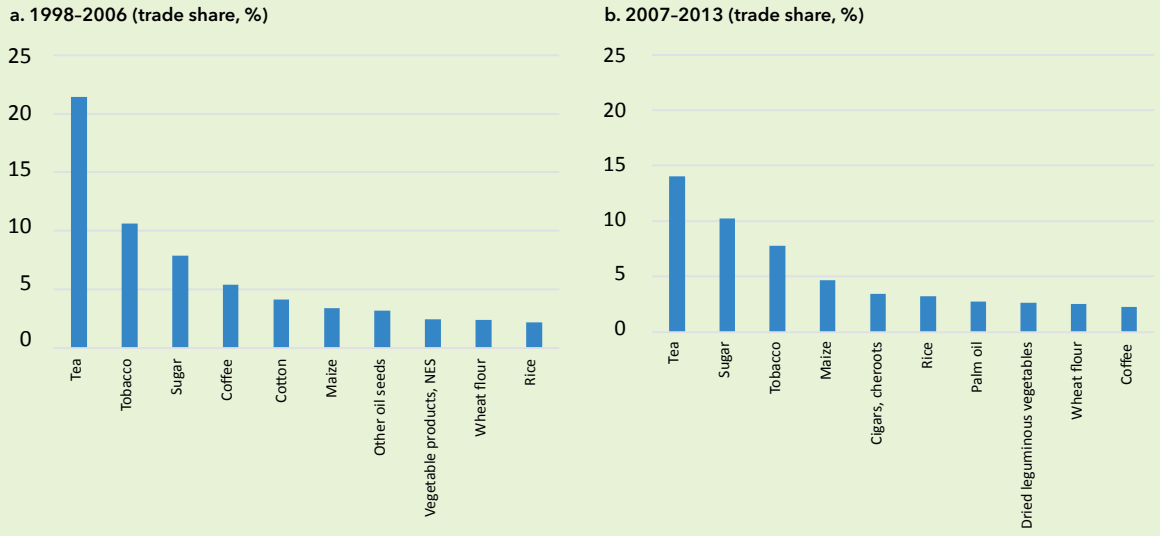
The Common Market for Eastern and Southern Africa

In both subperiods, the top-ranked commodity group traded among COMESA member countries was processed food, with a share of over one-third of all trade within the COMESA region (Table 3.8). Trade in coffee fell by 10 percentage points between the two subperiods under consideration, but remained significant throughout the entire 1998–2013 period. Following trends in ECOWAS and ECCAS, trade in cereals rose over time within COMESA.

In addition, trade in dairy products and live cattle also increased over time.

In general, the composition of the top-10 traded products within COMESA changed little between the two subperiods under consideration (Figure 3.22). Only cotton, other oil seeds, and vegetables dropped out of the top-10 ranking in 2007–2013. They were replaced by palm oil, dried leguminous vegetables, and cigars and cheroots.

Figure 3.22. The top-10 traded agricultural commodities in the COMESA region, 1998–2006 and 2007–2013



Source: Authors' calculations based on CEPII (2015).

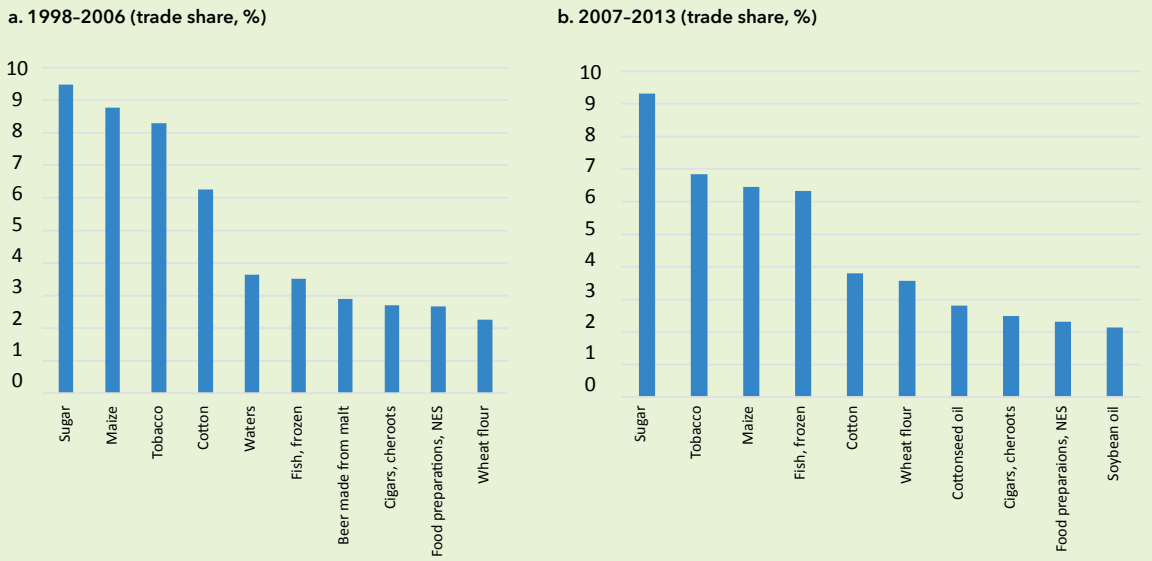
Note: COMESA = Common Market for Eastern and Southern Africa; NES = not elsewhere specified.

The Southern African Development Community

As in the other RECs, processed food products were the most important group traded within the SADC region over time, representing nearly half of all agricultural trade in both subperiods under consideration (Table 3.8). The shares of trade in fruit and oilseeds also remained unchanged between the two subperiods. All product groups recorded declines in their trade shares within the region between the two subperiods, with the exception of frozen fish products, which increased their share of intra-regional agricultural trade over time.

At the product level, the composition of trade within the region remained fairly stable. Sugar ranked first among the top-10 traded commodities in both subperiods, and its share of intra-regional trade also changed little. Maize and tobacco completed the top-three listing in both subperiods, although their shares fell somewhat in the more recent subperiod. Frozen fish products rose from sixth to fourth ranking, and doubled their share of intra-regional trade over time. Oil trade increased during the second period, with both cottonseed oil and soybean oil entering the top-10 ranking during 2007–2013, while water and beer made from malt fell off the list (Figure 3.23).

Figure 3.23. The top-10 traded agricultural commodities within the SADC region, 1998–2006 and 2007–2013



Source: Authors' calculations based on CEPII (2015).

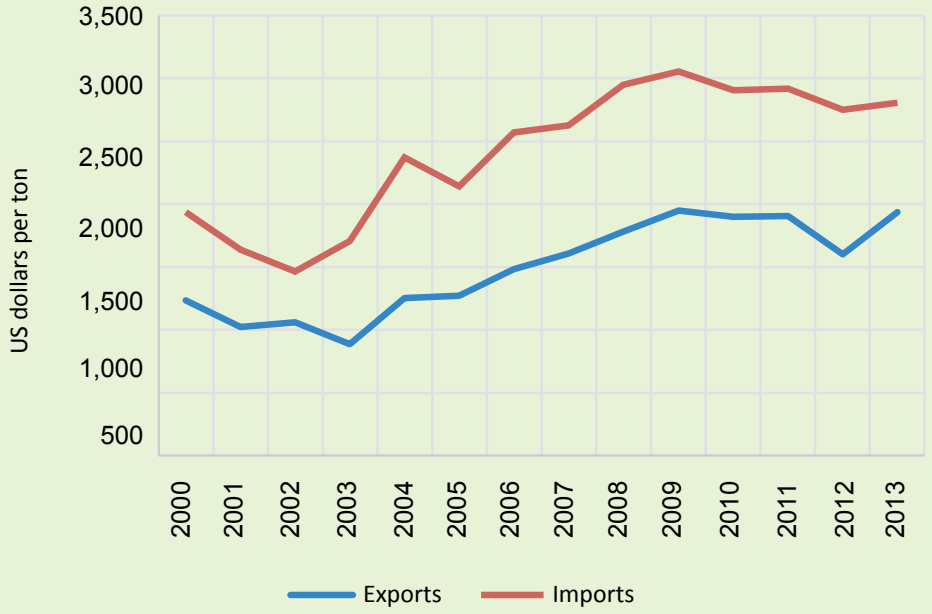
Note: SADC = Southern African Development Community.

Changes in Unit Values of Intra-African and Intra-Regional Agricultural Trade

Trade unit values are usually used as proxies for trade prices. They are calculated as the total value of trade shipments for individual commodity classes over a particular period, divided by the corresponding quantity being traded (IMF 2009). In analyzing these trends for Africa-wide and intra-regional trade, the trade unit values dataset by Berthou and Emlinger (2011) was utilized. This database contains bilateral trade unit values to the HS6 level. The following discussions concern unit values of agricultural trade among the 45 African countries represented in the Berthou and Emlinger database.

Between 2000 and 2013, the average unit values for Africa-wide agricultural trade rose at rates of 3.5 percent per year for exports, and 2.9 percent per year for imports (Figure 3.24). Unit values for exports grew at slightly higher rates during the 2007–2013 subperiod (3.9 percent) compared with the 2000–2006 subperiod (3.1 percent). In contrast, unit values for imports grew more slowly in the postcrisis period (1.3 percent) relative to the earlier timeframe (4.8 percent).

Figure 3.24. Changes in unit values for trade within Africa, 2000–2013



Source: Authors' calculations based on Berthou and Emlinger (2011) Trade Unit Value Database

Export unit values for agricultural trade within the ECOWAS region fell at 4.7 percent per year over time (Figure 3.25), but import unit values grew at 3.2 percent per year. For almost the entire period, import unit values were greater than export unit values; this suggests that existing trade agreements within the region are facing challenges to produce the expected results. Since important progress toward economic integration has been made, especially in terms of tariff measures, the price gap between imports and exports may be attributed to the existence of non-tariff barriers in crossborder trade within the region.

Figure 3.25. Changes in unit values for trade within the ECOWAS region, 2000–2013

Source: Authors' calculations based on Berthou and Emlinger (2011) Trade Unit Value Database.

Note: ECOWAS = Economic Community of West African States.

Within ECCAS, data reveal a large gap in the unit values of imports and exports during 2000–2006 compared with 2007–2013 (Figure 3.26). Export unit values rose by 25.9 percent and import unit values by 15.5 percent during the 2000–2006 period, compared with declines of 4.8 percent and 4.5 percent, respectively, during 2007–2013. This may reflect an improvement in regional integration during the more recent subperiod. Notably, unit values for trade within the ECCAS region are the highest among the four RECs.

Figure 3.26. Changes in unit values for trade within the ECCAS region, 2000–2013

Source: Authors' calculations based on Berthou and Emlinger (2011) Trade Unit Value Database.

Note: ECCAS = Economic Community of Central African States.

Within COMESA, unit values for trade in agricultural products remained comparatively stable over time (Figure 3.27). Export unit values increased at 4.1 percent per year, whereas import unit values grew at 3.5 percent per year. Export unit values showed faster growth during the second subperiod (from 2.0 percent during 2000–2006 to 5.9 percent during 2007–2013), but import unit value growth slowed over time (from 5.6 percent during 2000–2006 to 1.8 percent during 2007–2013).

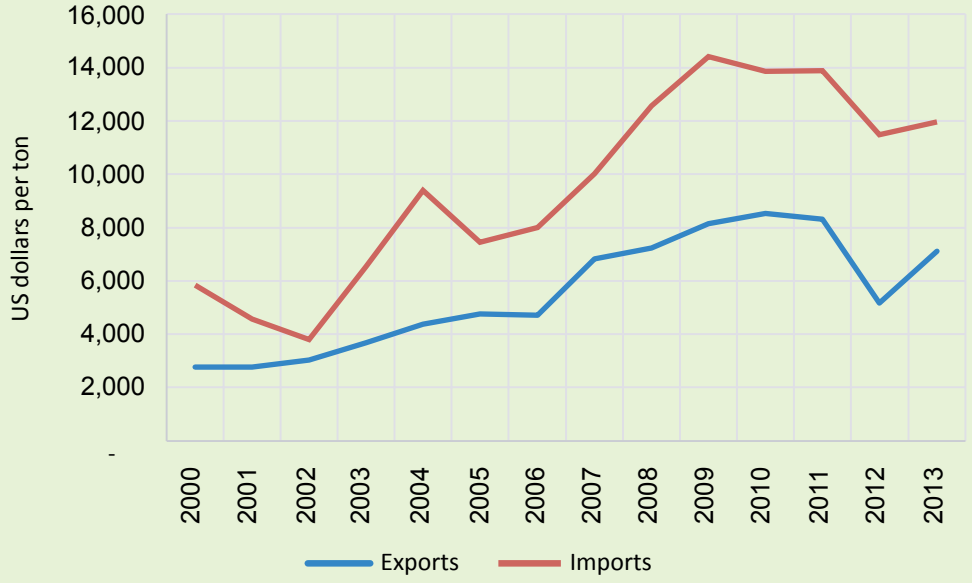
Figure 3.27. Changes in unit values for trade within the COMESA region, 2000–2013

Source: Authors' calculations based on Berthou and Emlinger (2011) Trade Unit Value Database.

Note: COMESA = Common Market for Eastern and Southern Africa

Unit values for imports and exports within the SADC region grew steadily throughout the entire period considered (Figure 3.28). Export unit values grew at 7.5 percent per year and imports at 5.7 percent per year.

Figure 3.28. Changes in unit values for trade within the SADC region, 2000–2013



Source: Authors' calculations based on Berthou and Emlinger (2011) Trade Unit Value Database.

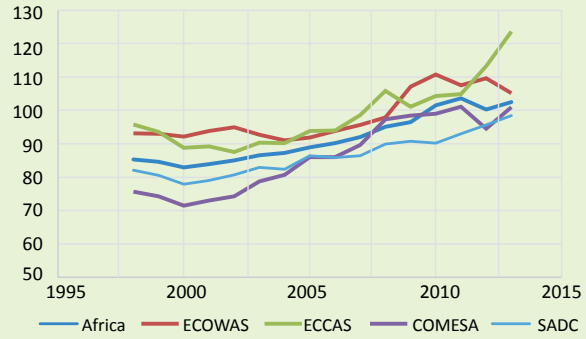
Note: SADC = Southern African Development Community.

An index of export/import values was calculated for agricultural and nonagricultural products following the methodological note by OECD (2011) and using the Fisher index (Fisher 1922). Thereafter, the terms of trade were derived for different commodity groups (Figure 3.29).

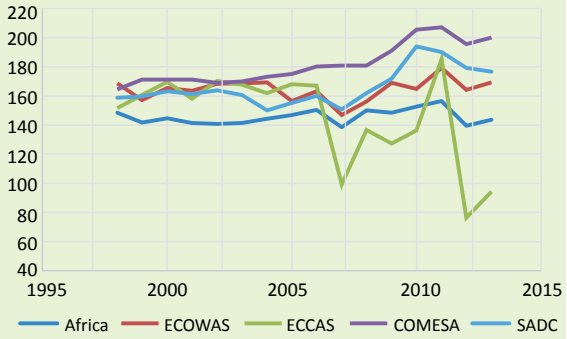
Before the global food crisis of 2007/2008, African economies exported cheaper agricultural products but imported more expensive ones. However, the terms of trade for nonagricultural products indicate that ECOWAS, COMESA, and SADC all received better prices for those products.

Figure 3.29. Evolution of the terms of trade by region and Africa-wide

a. All agricultural products



b. All nonagricultural products



Source: Authors' calculations based on CEPII (2015).

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = Economic Community of West African States; and SADC = the Southern African Development Community.

Conclusion

Analysis of the recent performance of agricultural trade both within Africa and among the RECs indicates that the value of agricultural trade within Africa grew rapidly over time, from $2.2 billion in 1998 to $12.8 billion in 2013. Average growth during this period was around 12 percent per year. Agricultural trade within the four RECs also grew significantly over this timeframe. Within the ECOWAS region, agricultural trade grew at a rate of 12 percent per year, rising from US$494 million in 1998 to $2.84 billion in 2013. Nevertheless, trade among ECOWAS member countries was highly erratic. ECCAS member countries recorded the highest overall average growth in intra-regional agricultural trade (17 percent per year), with the nominal value rising from $14 million in 1998 to $147 million in 2013. Agricultural trade among COMESA member countries also grew significantly (14 percent per year), rising from $379 million in 1998 to $2.87 billion in 2013. Unlike in the other RECs, the gap in growth between 1998–2006 and 2007–2013 was very low among COMESA countries (less than 3 percentage points). The volume of intra-regional agricultural trade also increased significantly among COMESA members during 1998–2013 (22 percent per year). Finally, the SADC region recorded the lowest rate of growth (10 percent per year), and the nominal value of its trade rose from $871 million in 1998 to $3.82 billion in 2013.

In assessing intra-African trade integration, results indicate that nearly half of all agricultural trade by ECCAS member countries occurred with countries outside their REC, making this region the highest contributor to inter-regional African trade. Results are slightly lower for the COMESA region, whereas ECOWAS and SADC trade the least with African countries outside of their regions. It may be that ECCAS trades more with other regions based on its smaller size, but the fact the COMESA—one of the largest RECs—ranks a (relative) close second to ECCAS would weaken this argument.

In terms of destinations and origins of intra-African trade, COMESA and SADC are the leading regions above ECOWAS and ECCAS; it should be noted, however, that COMESA and SADC have opposite patterns. The COMESA region increased its share of both exports and imports over the period under consideration, whereas the SADC region's shares of exports and imports declined. Moreover, in the aggregate, agricultural trade within each region increased for all the RECs. Regarding the main agricultural products traded among African countries, no notable changes occurred over time.

References

Berthou, A., and C. Emlinger. 2011. *The Trade Unit Values Database*. CEPII Working Paper 2011-10. Paris: Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

CEPII (Centre d'Etudes Prospectives et d'Informations Internationales). 2015. "BACI: The International Trade Database at the Product Level." Accessed April 2017. www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=1.

Fisher, I. 1922. *The Making of Index Numbers: A Study of Their Varieties, Test, and Reliability*. Boston and New York: Houghton Mifflin Company.

IMF (International Monetary Fund). 2009. *Export and Import Price Index Manual: Theory and Practice*. Washington, DC.

OECD (Organisation for Economic Co-operation and Development). 2011. *Mexican Export and Import Unit Value Indices*. STD/TBS/WPTGS(2011)4. Paris.

4. COMPETITIVENESS OF AFRICAN AGRICULTURAL EXPORTS

Sunday Pierre Odjo and Ousmane Badiane

The performance of African agricultural trade has improved in recent years. Substantial gains have been made in export value, with a concomitant increase in Africa's share of global exports. Agricultural imports by African countries have increased faster, however, and the continent is still below the world market share it secured three decades ago. Thus, accelerating current export trends and diversifying African export commodities and destination markets appear as a crucial policy objective in an attempt to reduce foreign trade deficits across countries and help stabilize intra-African food markets. To that end, a starting point is greater understanding of how current advances in African exports have been brought about. Of particular interest is how changes in domestic production and trading conditions have enabled the improvement or degradation of Africa's export competitiveness in global as well as intra-African markets. This knowledge would provide more insight into national and regional strategies to help exploit untapped export potential and opportunities for investments in emerging markets and new export commodities.

This chapter investigates the patterns and determinants of changes in export competitiveness among African countries and products over the 1998–2013 period. It is based on the measurement of changes in competitiveness through analyses of the decomposition of constant market shares and comparisons of competitive effects in alternative export destination markets and across countries and commodity groups. The next section presents the analytical methods and data used to derive changes in country- and commodity-level competitiveness. Thereafter, country and commodity rankings are examined based on their competitiveness in global markets; competitiveness rankings in global and intra-African markets are compared; and corresponding rankings in the markets of the regional economic communities (RECs) are examined, including the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS), and the Southern African Development Community (SADC).

Finally, an econometric model of the determinants of changes in country competitiveness in alternative agricultural export markets is proposed, the main findings are summarized, and recommendations for policy action are offered.

Model and Data Description

The Model

Competitiveness has been widely explored through the Constant Market Share (CMS) decomposition model as a means of assessing how countries compare with their competitors in terms of their trade performance across time. Since its first application to trade analysis by Tyszynski (1951), the CMS methodology has been refined and expanded through alternative model formulations attempting to enrich its analytical features (Leamer and Stern 1970; Richardson 1971a; Richardson 1971b) or to deal with issues arising with its applications (Cheptea, Gaulier, and Zignago 2005). The formulation used in this chapter was developed by Magee (1975). It explains the growth in a country's or region's share of world markets by decomposing it into two major growth sources: (1) structural changes in market distribution and product composition, and (2) changes in competitiveness. The market share growth model starts with the following identity.

$$S^m_{t_1} = R^m \cdot S^m_{t_0} \quad (1)$$

where $S^m_{t_0}$ and $S^m_{t_1}$ denote the shares of a given country or region m in total world exports in the beginning and end periods t_0 and t_1, respectively. R^m represents a relative growth factor defined as follows:

$$R^m = \frac{1 + g^m}{1 + g^w} \quad (2)$$

where g^m and g^w stand for the compound yearly growth rate (between the beginning and end periods) of total exports of country or region m and of the world w, respectively. Equation (2) expresses the growth of country or region m's exports relative to the world's exports and can be rewritten as

$$R^m = \sum_i \left(\frac{1 + g^m_i}{1 + g^w} \right) \left(\frac{X^m_{it_0}}{X^m_{t_0}} \right) \quad (3)$$

with

$$X^m_{t_0} = \sum_i X^m_{it_0}$$

where i denotes export products, and $X^m_{it_0}$ stands for the country's or region's exports of product i and $X^m_{t_0}$ its total exports of all goods to world markets in the first period.

Expressing X^m_{t0} for the different export products i and destinations j in (3), multiplying by $[(1 + g^w_i)X^m_{it_1} / (1 + g^m_i)X^m_{it_0}]$ and by $[(1 + g^{wj}_i) / (1 + g^{wj}_i)]$, and summing over i and j yields the following, after rearranging and substituting the new expression for (3) in (1):

$$S^m_{t_1} = S^m_{t_0} \sum_i \frac{(1 + g^w_i) X^m_{it_1}}{(1 + g^w_i) X^m_{t_1}} \sum_j \frac{(1 + g^{mj}_i)(1 + g^{wj}_i) X^{mj}_{it_0}}{(1 + g^{wj}_i)(1 + g^w_i) X^m_{it_0}} \quad (4)$$

with

$$X^m_{it_0} = \sum_j X^{mj}_{it_0}$$

where $X^{mj}_{it_0}$ denotes the country's or region's exports of product i to destination j in the first period.

The objective in this chapter is to rank African countries and agricultural commodities on changes in their competitiveness in different export markets, including global markets (treated as one market entity); intra-African markets (treated as one market entity); and the regional markets of COMESA, ECCAS, ECOWAS, and SADC (each treated as one market entity). Therefore, the model is applied in three different settings corresponding to different levels of exporters and products aggregations as indicated below.

In the first setting, m represents Africa as a whole and the model decomposes the growth in Africa's share of world exports of each of 59 agricultural commodity groups i. The second setting is a variant of the first, where m stands for each REC as an aggregate exporter instead of Africa as a whole. Thus, the model explains the growth in the REC's share of world exports of each of 59 agricultural commodity groups. In the third setting, m denotes each of 51 African countries, and i is an aggregate agricultural good. The model decomposes the growth in a country's share of world aggregate agricultural exports. In all three settings, calculations are carried out for j representing, in turn, global markets, intra-African markets, and each of the regional markets of COMESA, ECCAS, ECOWAS, and SADC. With exporters and products aggregated as defined in the three settings, equation (4) simplifies to

$$S_{t_1}^{m} = S_{t_0}^{m} \sum_i \underbrace{\frac{(1+g_i^{mj})}{(1+g_i^{wj})}}_{(a)} \underbrace{\frac{(1+g_i^{wj})}{(1+g_i^{w})}}_{(b)} \underbrace{\frac{X_{it_1}^{mj}}{X_{it_0}^{m}}}_{(c)} \tag{5}$$

In the case where represents global markets, equation (4) further simplifies to

$$S_{t_1}^{m} = S_{t_0}^{m} \frac{(1+g_i^{mj})}{(1+g_i^{wj})} \tag{6}$$

From equation (1) it is clear that whether a country's or region's share of world exports increases or diminishes during the considered time period depends on whether the growth factor R is greater or less than unity. Given the reduced expression for R in equation (5), the contribution of a destination to the performance of a given country or region (in terms of the change in its export share) can be decomposed into two components: a competitive effect and a market effect.

The competitive effect corresponds to the first expression (a) of the right hand side of equation (5). It is a measure of the change in competitiveness experienced by country or region m in exporting a good i to destination j. If it is greater (or smaller) than 1.0, the competitive effect translates some gain (or loss) of competitiveness by the country or region compared with the group of its competitors in the export destination considered.

The market effect corresponds to the product of the terms (b) and (c) in equation (5). It measures the portion of the country's or region's export share growth which is due to faster or slower growth of world exports of good i to destination markets j compared with global markets. It reflects the change in the importance of j as a destination for the country's exports attributable to the expansion of markets j. For instance, in the case where j denotes the regional markets of a REC, the market effect translates as the change in the importance of the community markets as a destination for its members' exports which is associated with the expansion of the regional markets. For an easier interpretation, the market effect MRK can be derived in value terms from the simplified expression in equation (5) as follows:

$$MRK = \left[\frac{(1+g_i^{wj})}{(1+g_i^{w})}\frac{X_{it_0}^{mj}}{X_{it_0}^{m}} - \frac{X_{it_0}^{mj}}{X_{it_0}^{m}}\right]X_{it_1}^{m} \qquad (7)$$

The value of MRK measures the magnitude of the positive or negative impact of the expansion of markets on the considered country or region's export performance. As it appears in equation (6), it is clear that no market effect can be derived in the case where global markets are the destination under consideration.

Data Sources and Product and Country Coverage

The model is applied using data on the values of bilateral exports of agricultural products at the HS4 aggregation level[8] over the 1998–2013 period. The data were obtained from the International Trade Database at the Product Level (BACI) built by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The data are for individual African countries, except for the members of the Southern African Customs Union (SACU), namely Botswana, Lesotho, Namibia, South Africa and Swaziland, for which trade data are aggregated in the database.

For this analysis, bilateral export values are first aggregated so as to construct the variables of each country's total exports to world markets, to intra-African markets, and to each REC's regional markets. These are then aggregated to construct the variables of Africa's and each REC's aggregate exports to the different export markets under consideration.

In addition, bilateral export values are aggregated from the BACI database to construct the variables of the world's total exports of the different agricultural products to the different export destinations under analysis. In order to reduce the number of HS4 product lines, the different variables were aggregated from HS4 to HS2 level, except for a few HS4 lines of interest that were kept as such.

The final dataset used for the CMS model comprises 59 commodity groups (hereafter designated as commodities or products) and 51 individual countries, including the SACU country aggregate described above.

The dataset includes all 11 ECCAS members and all 15 ECOWAS members. SADC enters the dataset with 10 individual member countries, while its other 5 members are aggregated as one case (SACU countries). With Swaziland among the aggregated countries, COMESA is left with 18 of its 19 members. The dataset also includes some countries that are not members of any REC, including Algeria, Mauritania, Morocco, Saint Helena, Somalia, Tunisia, and Western Sahara.

[8] The Harmonized System (HS) is an international nomenclature for the classification of products that allows participating countries to classify traded goods on a common basis for customs purposes.

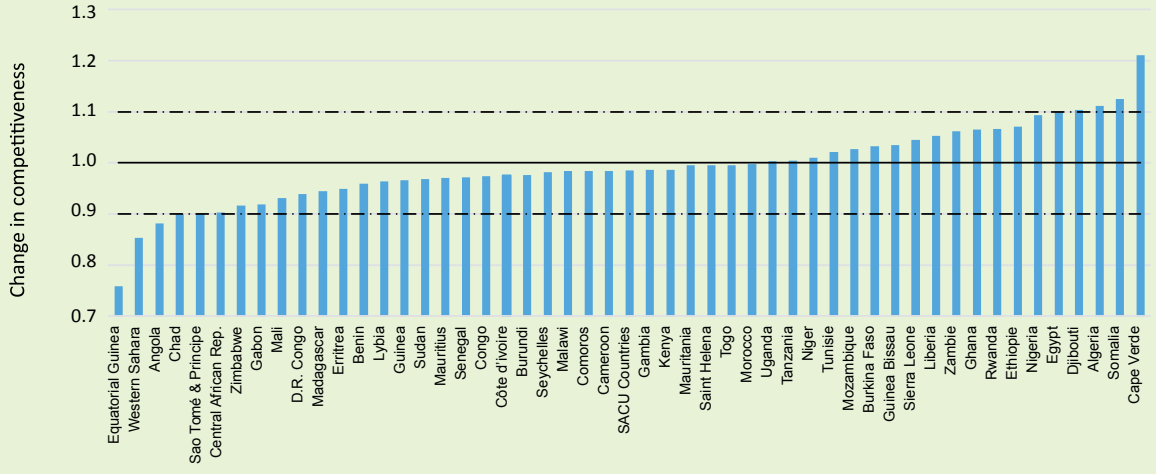
Only competitive effect values are reported and analyzed in this chapter. In addition, the chapter does not present results of the application of the model under the second setting (where the model decomposes the export share growth for each REC as an aggregate exporter). Thus, in the following development, the results that refer to the change in a REC's competitiveness reflect averages of changes in the competitiveness of its member countries. Unsurprisingly, such averages reveal more meaningful differences across RECs than do the results obtained from modeling the RECs as aggregate exporting entities.

Competitiveness in Global Markets: Country and Commodity Rankings

The values of the competitive effect derived from the decomposition analysis of growth shares for individual African countries are presented in Table 4A.1 in Appendix 4A. They reflect the changes in competitiveness of African countries compared with their competitors as a group in selected agricultural export markets during 1998–2013.

The coefficients of the competitive effect in global markets are smaller than 1.0 for 32 of the 51 countries under analysis, which means that those countries have underperformed the group of their competitors in global markets (Figure 4.1). The countries with the largest declines in competitiveness include three ECCAS members (Equatorial Guinea, Angola, and Chad) for which estimates of the competitive effect are not greater than 0.9. Between the 0.9 and 1.0 thresholds are the values of the competitive effect estimated for all other ECCAS members, with the only exception being Rwanda. Apart from Angola, almost two-thirds of the other SADC members recorded a competitive effect within the 0.9 to 1.0 interval, the three exceptions being Mozambique, Tanzania, and Zambia. As many ECCAS and SADC members are also COMESA members, up to two-thirds of COMESA members are among the countries that underperformed the group of their competitors. For ECOWAS, half of its members are also among underperforming countries.

Figure 4.1. Change in country competitiveness in global agricultural export markets, 1998–2013



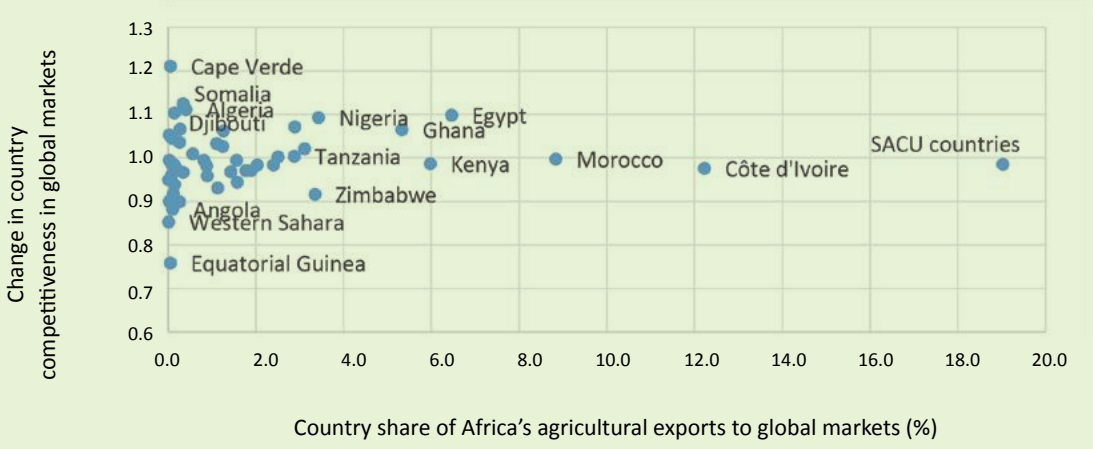
Source: Authors' calculations based on CEPII (2015).

Note: The change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

However, for 19 of the 51 countries considered, the coefficients of the competitive effect are greater than 1.0. These countries succeeded in raising their levels of competitiveness by expanding their exports to global markets faster than their competitors. The strongest increases in competitiveness were achieved by Cabo Verde, Somalia, Algeria, and Djibouti, where estimated values of the competitive effect are greater than 1.1. The other 15 countries more modestly outperformed their competitors, with competitive effect values between the 1.0 and 1.1 thresholds. These countries include the other half of ECOWAS members (Niger, Burkina Faso, Guinea-Bissau, Sierra Leone, Liberia, Ghana, and Nigeria). Tunisia also falls within the outperforming countries, as do Tanzania, Mozambique, and Zambia within SADC and Uganda, Rwanda, Ethiopia, and Egypt within COMESA.

Changes in country competitiveness are plotted in Figure 4.2 against country shares in Africa's global agricultural exports as presented in Table 4A.2. The most notable changes in competitiveness occurred among countries that contribute very small shares of African global exports. Conversely, countries with higher export shares did not experience a notable change in competitiveness. Thus, Africa's export performance mostly improved among small exporting countries like Algeria, Cabo Verde, Djibouti, and Somalia, whereas it stagnated among larger exporting countries like Côte d'Ivoire, Kenya, and Morocco. It is worth noting the performance of Egypt and Ghana, in that both countries represented at least 5 percent of Africa's global agricultural exports during 1998–2013, and both recorded an index of change in competitiveness close to 1.1.

Figure 4.2. Changes in country competitiveness compared with shares of Africa's agricultural exports to global markets, 1998–2013

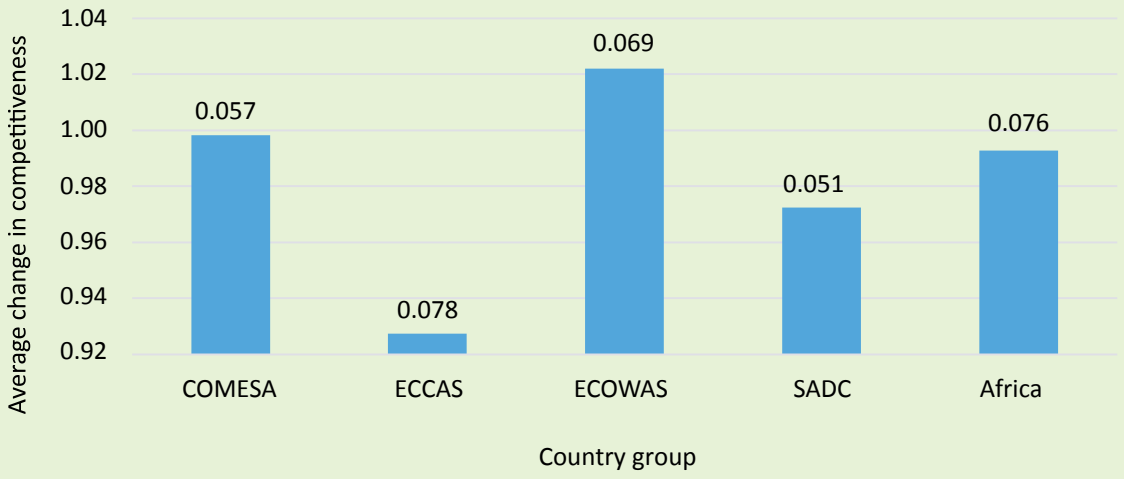


Source: Authors' calculations based on CEPII (2015).

Note: The change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

In sum, ECCAS appears to be lagging behind in its attempts to increase its competitiveness in global agricultural export markets, but the shares of underperforming countries within COMESA, ECOWAS, and SADC are also of concern. In order to get clearer insight into the differences among regional country groupings, average sizes of the competitive effect were plotted (Figure 4.3). Within-group variations in the values of the competitive effect seem to be homogenous across groups, which justifies comparisons of the average effects. SADC, and more notably ECCAS, members appear to have lost competitiveness on average, with ECCAS showing a bigger loss. In contrast, on average, ECOWAS members appear to have raised their competitiveness, whereas little or no average change was recorded by COMESA members.

Figure 4.3. Average change in competitiveness in global agricultural export markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries. Standard deviation values are shown on top of the bars.

Table 4.1. Analysis of variance of changes in country competitiveness in global agricultural export markets, 1998–2003

Test group	Sum of squares		df	Mean square	F	Sig.	Eta squared
COMESA vs. non-COMESA countries	Between groups	0.001	1	0.001	0.142	0.708	0.003
	Within groups	0.286	49	0.006			
	Total	0.287	50				
ECCAS vs. non-ECCAS countries	Between groups	0.06	1	0.060	12.919	0.001	0.209
	Within groups	0.227	49	0.005			
	Total	0.287	50				
ECOWAS vs. non-ECOWAS countries	Between groups	0.018	1	0.018	3.282	0.076	0.063
	Within groups	0.269	49	0.005			
	Total	0.287	50				
SADC vs. non-SADC countries	Between groups	0.006	1	0.006	1.009	0.32	0.02
	Within groups	0.281	49	0.006			
	Total	0.287	50				

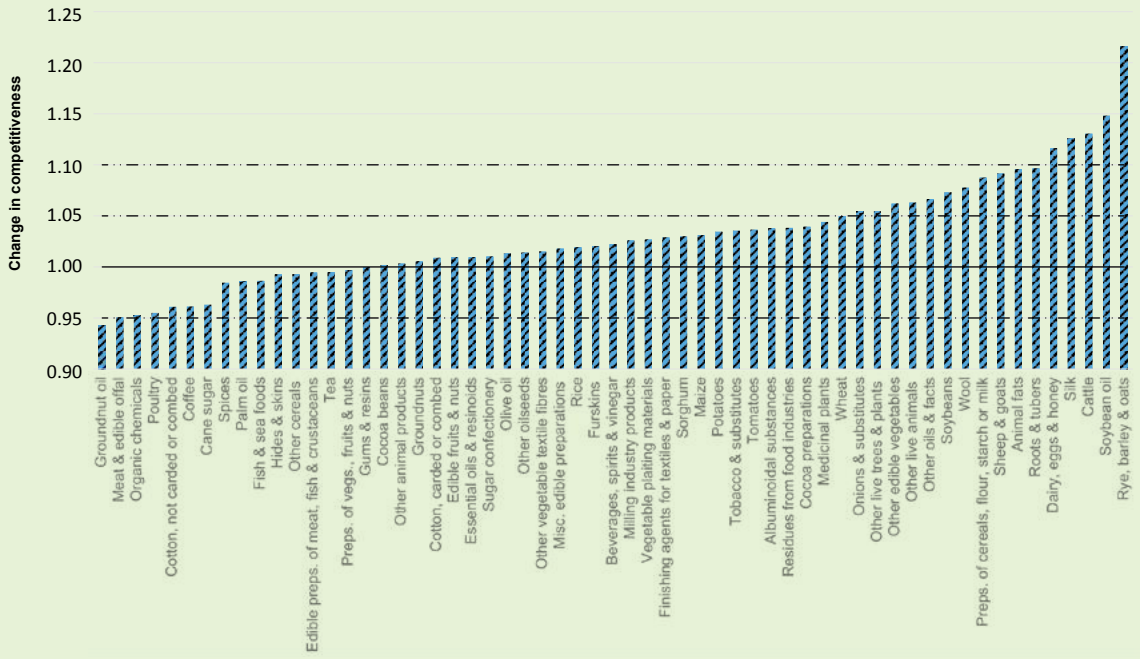
Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

An analysis of variance was undertaken to statistically test the difference between each regional country grouping and the rest of Africa (Table 4.1). The results confirm that the size of competitive effects are, on average, significantly lower for ECCAS and higher for ECOWAS compared with other African countries/regions. However, variations across groups contribute minimally to the overall variations among countries. This means that the larger part of the variations in the change in competitiveness between countries is not related to regional factors, but to domestic ones, such as changes in total factor productivity and the competitiveness of most exported commodities by individual countries. Indeed, as postulated by Hausman, Hwang, and Rodrik (2005), what countries export matters for their overall competitiveness.

Table 4A.3 (in Appendix 4A) presents the values of the competitive effect calculated for agricultural commodities through the decomposition of Africa's commodity-specific growth in export shares in alternative export markets during 1998–2013. The values capture the magnitudes of changes in competitiveness that Africa achieved compared with its non-African competitors in the different export markets. In Figure 4.4, commodities are sorted in increasing order of changes in competitiveness in global markets. In addition to the threshold of 1.0, demarcating commodities in which Africa lost competitiveness from those in which Africa gained competitiveness, thresholds of 0.95, 1.05, and 1.10 are also presented to more clearly differentiate between lower and higher losses or gains.

Figure 4.4. Changes in competitiveness of commodities in global agricultural export markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

African exporters lost competitiveness in global markets in the exports of 15 of 59 commodities. Important food staples affected include groundnut oil, meat and edible offal, poultry, palm oil, fish and seafood, and some cereals (within the commodity group comprising buckwheat, millet, and canary seed). However, the size of the loss in competitiveness was modest (the corresponding estimates of the competitive effect fall within the 0.95 to 1.0 interval).

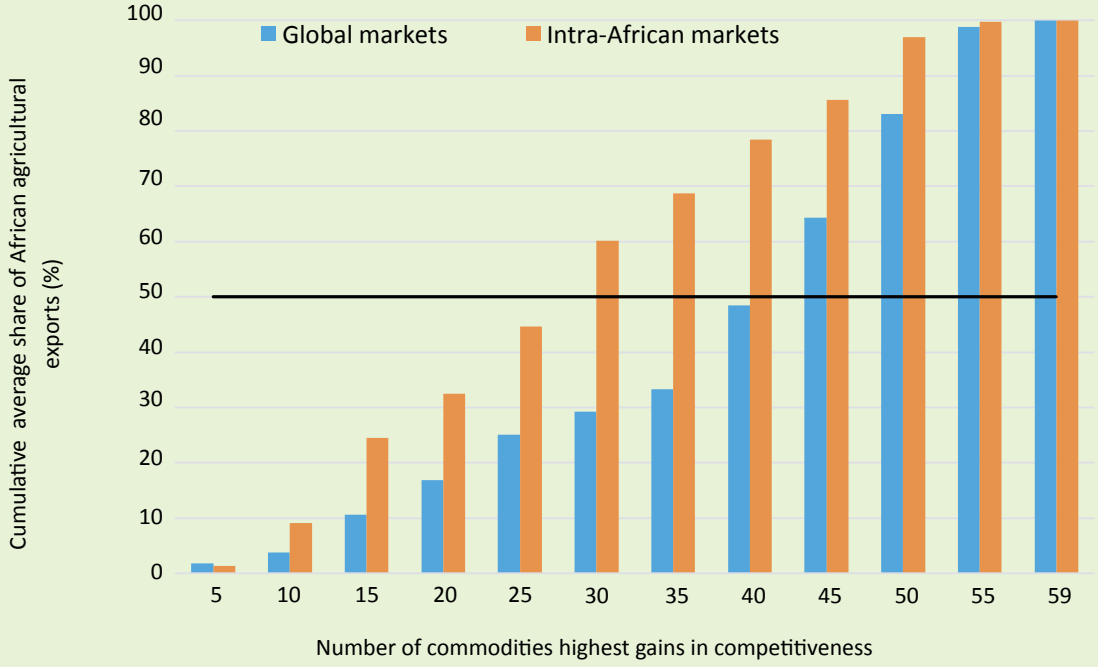
For the majority of the commodities under analysis, Africa increased its competitiveness in global markets by expanding its exports of

these commodities faster than did the group of non-African competitors. Up to 44 of 59 commodities considered show a competitive effect higher than 1.0. Commodities with the strongest increase in competitiveness, with values greater than 1.10, were rye, barley, and oats; soybean oil; cattle; silk; and dairy, eggs, and honey. Many food staples are found among the commodities for which gains in competitiveness were higher than 1.05 but smaller than 1.1. Such commodities include roots and tubers, sheep and goats, other live animals, onions and substitutes, and wheat. But a number of other staples are among commodities for which Africa more modestly outperformed its group of competitors, including tomatoes, potatoes, maize, sorghum, and rice, which show competitive effect values in the 1.0 to 1.05 interval.

Overall, African exporters either lost competitiveness or modestly increased competitiveness for traditional African cash crops like coffee, cocoa beans, tea, cotton, groundnut oil, palm oil, sugarcane, groundnuts, and other oilseeds.

In contrast, exporting countries were, on average, able to improve their competitiveness for new export commodities like wool, soybeans, soybean oil, live trees and plants, and cocoa preparations. Figure 4.5 presents an assessment of the importance of the commodities with the highest competitiveness gains in terms of their shares of the value of Africa's total agricultural exports to global markets compared with intra-African markets. The top-15 commodities account for only 10 percent of Africa's global agricultural exports, and the top-40 commodities in the ranking barely reach the 50 percent share threshold. Conversely, the bottom-19 commodities in the ranking represent up to 51.5 percent of African agricultural exports. This confirms the implication that competitiveness gains in global markets are not only occurring for traditional African export commodities, but also for emerging export products. It is indicative of the scope for further expanding Africa's global exports by exploiting increased commodity competitiveness.

Figure 4.5. Relative importance of commodities with the highest increase in competitiveness in global and intra-African markets



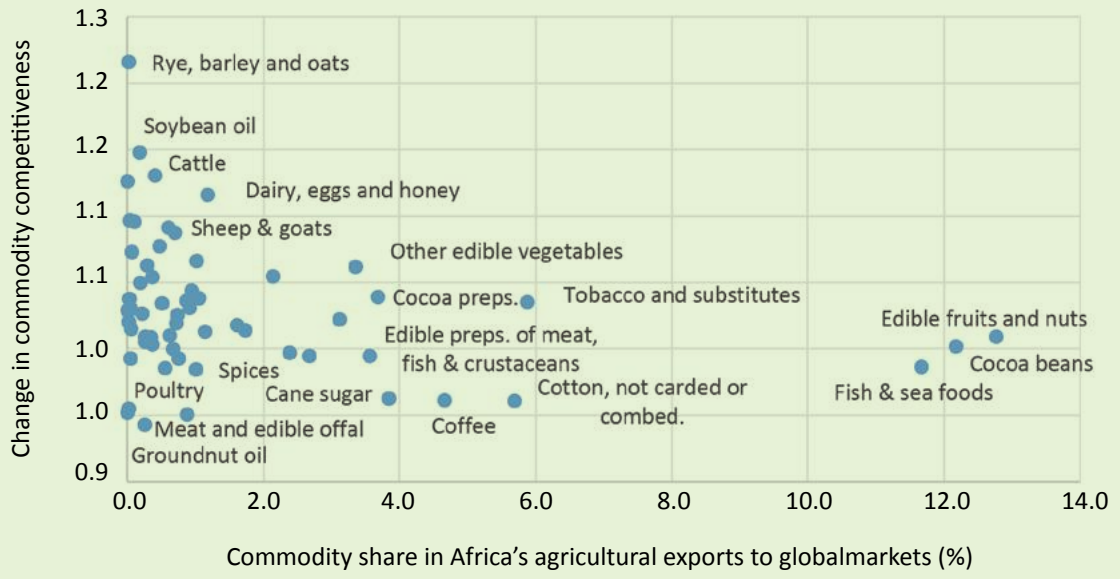
Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

The same conclusions are illustrated in Figure 4.6, which shows a scatter plot of changes in commodity competitiveness against commodity shares in Africa's global agricultural exports (presented in Table 4A.4 in Appendix 4A). Changes in competitiveness were generally achieved for commodities that account for small shares of Africa's global agricultural exports.

Conversely, commodities that represent higher export shares recorded little or no change in competitiveness. Thus, the performance of African exporters mostly improved in minor export products like rye, barley, and oats; soybean oil; and cattle, whereas their performance stagnated in major export products like edible fruit and nuts, cocoa beans, fish and seafood, coffee, cotton, and cane sugar.

Figure 4.6. Changes in commodity competitiveness compared with commodity shares of Africa's agricultural exports to global markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

So far the analysis has focused on changes in competitiveness for countries and commodities in global markets. The next section explores changes in the competitiveness of countries and commodities in intra-African markets compared with the results for global markets already discussed.

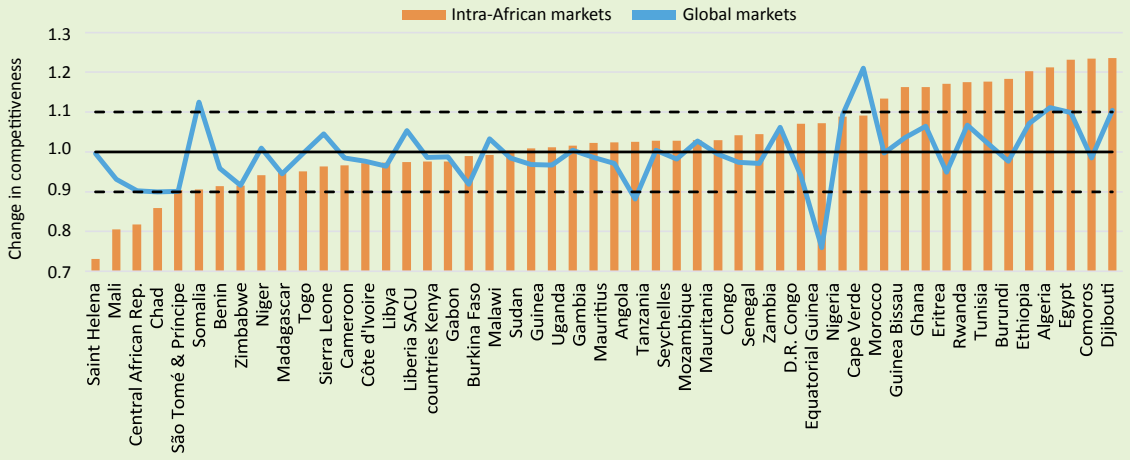
Competitiveness in Intra-African Markets: Country and Commodity Rankings

Changes in the competitiveness of individual African countries in global and intra-African agricultural markets were measured by the coefficients of the competitive effect derived through country-level share growth decomposition (Figure 4.7 and Table 4A.1). In the case of intra-African markets, only 20 countries recorded competitiveness changes lower than 1.0, compared with 32 countries in the ranking of competitiveness in global markets (see Figure 4.1). This means that a smaller share of African countries underperformed their competitors in intra-African markets compared with global markets. Of those 20 countries,

Saint Helena, Mali, Central Africa Republic, and Chad strongly underperformed, with competitive effect values lower than 0.9.

At the top of the ranking, 12 countries strongly outperformed, with estimates of the competitive effect greater than 1.1. The top-five ranked countries are Djibouti, Comoros, Egypt, Algeria, and Ethiopia. It is worth recalling that only four countries reached that level of increased competitiveness in global markets. More interestingly, almost all the outperforming countries performed better in intra-African markets than in global markets (Figure 4.7). And conversely, almost all underperforming countries lost more competitiveness in intra-African markets than in global markets.

Figure 4.7. Change in competitiveness of countries in intra-African agricultural export markets compared with global markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Table 4.2. Paired-sample T-tests for equality of changes in country competitiveness in pairs of African agricultural export markets

Paired markets	Paired samples correlation			Mean paired differences	t	df	Sig. (2-tailed)
	N	Correlation	Sig.				
COMESA and global markets	48	0.417	0.003	0.002	0.086	47	0.932
ECCAS and global markets	46	0.631	0.000	-0.030	-2.183	45	0.034
ECOWAS and global markets	50	0.239	0.095	-0.009	-0.514	49	0.610
SADC and global markets	50	0.114	0.431	-0.025	-1.387	49	0.172
Intra-African and global markets	50	0.398	0.004	0.033	2.144	49	0.037
COMESA and intra-African markets	48	0.721	0.000	-0.024	-1.690	47	0.098
ECCAS and intra-African markets	46	0.479	0.001	-0.069	-4.069	45	0.000
ECOWAS and intra-African markets	50	0.487	0.000	-0.042	-2.532	49	0.015
SADC and intra-African markets	50	0.574	0.000	-0.058	-3.904	49	0.000

Source: Authors' calculations based on CEPII (2015).

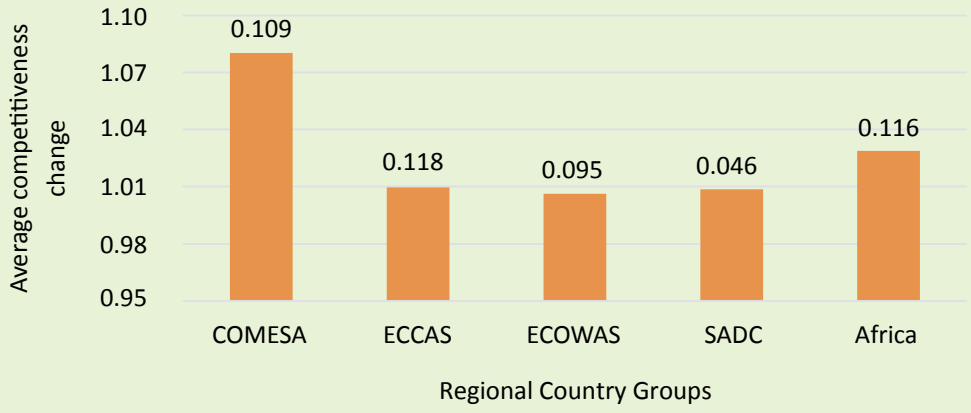
Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries

The results of paired-sample T tests for no difference between competitive effects in global versus regional and intra-African markets are presented in Table 4.2. The last row of the first panel shows that changes in competitiveness in intra-African and global markets are weakly and positively correlated. In other words, overall, changes in competitiveness were higher in intra-African markets compared with global markets, but not consistently for all sample countries. It also appears that a significant difference exists in the magnitude of changes in competitiveness between intra-African and global markets. On average, changes in competitiveness were higher by 0.033 points in intra-African markets than in global markets.

It is of interest to see how the member countries of the different RECs performed in intra-African markets, on average.

COMESA members generally achieved higher gains in competitiveness than the rest of African countries in intra-African markets (Figure 4.8). Indeed, seven COMESA members ranked in the top ten (Djibouti, Comoros, Egypt, Ethiopia, Burundi, Rwanda, and Eritrea), and only Kenya ranked within the bottom 20 (Figure 4.7). An analysis of variance of the competitive effect in intra-African markets confirms that, on average, COMESA members performed significantly better than other African countries (Table 4.3). In contrast, no perceptibly significant difference exists among the members of ECCAS, ECOWAS, and SADC in terms of changes in their competitiveness in intra-African markets. This may be due in part to differences in competitiveness gains achieved for particular export commodity groups.

Figure 4.8. Average change in competitiveness in intra-African agricultural export markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries. Standard deviation values are shown on top of the bars.

Table 4.3. Analysis of variance in changes in country competitiveness in intra-African agricultural export markets, 1998–2013

Test group	Sum of squares		df	Mean square	F	Sig.	Eta squared
COMESA vs. non-COMESA countries	Between groups	0.075	1	0.075	6.196	0.016	0.114
	Within groups	0.579	48	0.012			
	Total	0.654	49				
ECCAS vs. non-ECCAS countries	Between groups	0.005	1	0.005	0.379	0.541	0.008
	Within groups	0.649	48	0.014			
	Total	0.654	49				
ECOWAS vs. non-ECOWAS countries	Between groups	0.011	1	0.011	0.806	0.374	0.017
	Within groups	0.643	48	0.013			
	Total	0.654	49				
SADC vs. non-SADC countries	Between groups	0.006	1	0.006	0.424	0.518	0.009
	Within groups	0.648	48	0.014			
	Total	0.654	49				

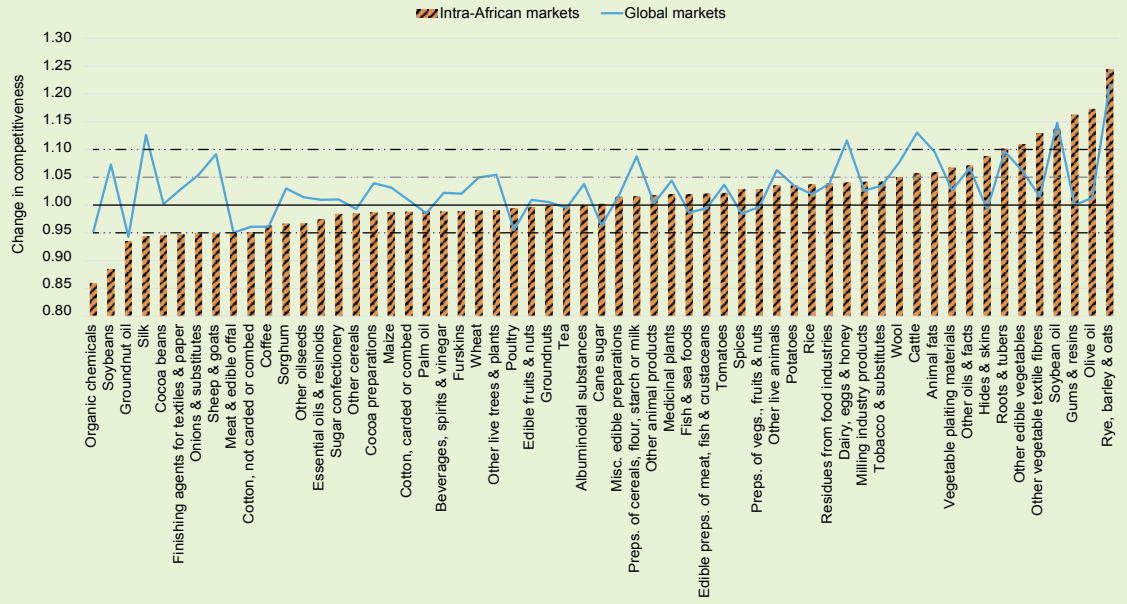
Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Changes in the competitiveness of African countries in intra-African and global markets for individual agricultural commodity groups are presented in Figure 4.9, constructed from Table 4A.3. For 29 of the 59 commodities under analysis, Africa underperformed the group of its competitors in intra-African markets. The corresponding number in the preceding ranking relative to global markets is 15 of 59 commodities. Furthermore, in terms of commodity competitiveness gains, it appears that Africa's performance was generally lower in intra-African markets than in global markets, as appears to be the case for the majority of commodities (Figure 4.9).

The statistical significance of these comparisons was analyzed through a test for equality of changes in commodity competitiveness in global markets compared with intra-African and regional markets. Competitiveness changes in intra-African and global markets are positively but weakly correlated (Table 4.4, last row). Simply put, changes in competitiveness tend to be greater in global markets than in intra-African markets, but not consistently across all commodities. At the 10 percent significance level, competitiveness changes were indeed lower in intra-African than in global markets; however, the average difference is as small as 0.014 points.

Figure 4.9. Change in competitiveness of commodities in intra-African agricultural export markets compared with global markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

Many staple food products are among the commodities for which Africa underperformed, including onions and substitutes, sheep and goats, meat and edible offal, poultry, sorghum, maize, wheat, and other cereals. Africa strongly or weakly outperformed its competitors in global markets in exporting some of those staples (onions and substitutes, sheep and goats, wheat, maize, and sorghum). Similarly to its competitiveness in global markets, Africa experienced positive changes in its competitiveness in intra-African markets for a number of other important foodstuffs, including roots and tubers; cattle; other live animals; dairy, eggs, and honey; rice; potatoes; tomatoes; and fish and seafood. In contrast, and as in global markets, Africa lost some competitiveness in intra-African markets for its traditional cash crops, such as coffee, cocoa beans, tea, cotton, groundnut oil, palm oil, groundnuts, and other oilseeds.

The products that showed the highest competitiveness increase in intra-African markets, including rye, barley and oats (maintaining the highest ranking) and soybean oil, also topped the rankings for global markets. It also appears that African exporters did better in intra-African markets than in global markets in exporting emerging export products like olive oil, soybean oil, gums and resins, other (than cotton) vegetable textile fibers, hides and skins, and spices. The top-15 commodities only accounted for 24.5 percent of intra-African agricultural exports during the timeframe under study, and the top-25 commodities did not reach the 50 percent share threshold (Figure 4.5). However, the contributions of the same numbers of the top-ranked commodities in global markets to Africa's global agricultural exports were much smaller—that is, more commodities with relatively higher export value gained competitiveness in intra-African markets compared with global markets (Figure 4.5). This is in line with the faster growth of intra-African agricultural trade in terms of value over the period under analysis.

Table 4.4. Paired-sample T test for changes in equality of commodity competitiveness in pairs of African agricultural export markets

Paired markets	Paired samples correlation			Mean paired differences	t	df	Sig. (2-tailed)
	N	Correlation	Sig.				
COMESA and global markets	59	0.475	0.000	–0.003	–0.306	58	0.761
ECCAS and global markets	59	0.430	0.001	–0.037	–4.238	58	0.000
ECOWAS and global markets	59	0.087	0.513	–0.020	–1.706	58	0.093
SADC and global markets	59	0.331	0.010	–0.015	–1.529	58	0.132
Intra-African and global markets	59	0.444	0.000	–0.014	–1.709	58	0.093
COMESA and intra-African markets	59	0.635	0.000	0.012	1.555	58	0.125
ECCAS and intra-African markets	59	0.377	0.003	–0.022	–2.246	58	0.029
ECOWAS and intra-African markets	59	0.294	0.024	–0.005	–0.484	58	0.630
SADC and intra-African markets	59	0.637	0.000	–0.001	–0.129	58	0.898

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

Competitiveness in Regional Markets: Country and Commodity Rankings

The analysis now turns to exploring the scope of Africa's competitiveness gains or losses in regional markets during the 1998–2013 timeframe, ranking African countries in increasing order of improvements in their competitiveness in the agricultural markets of each REC and comparing changes in competitiveness in regional markets with those in global and intra-African markets.

Ten countries (Cameroon, Central African Republic, Kenya, Madagascar, Mali, Niger, São Tomé and Príncipe, Togo, Zimbabwe, and SACU countries as a group) underperformed in all four regional markets (Figure 4A.1.in Appendix 4A). Similarly, nine countries (Algeria, Egypt, Ethiopia, Malawi, Mauritania, Morocco, Nigeria, Rwanda, and Senegal) outperformed in all regional markets. As a general trend, changes in country competitiveness in regional markets were lower than in broader intra-African and global markets, particularly among the lowest-ranked countries.

Results from the test for equality reveal that average changes in competitiveness were significantly lower in ECCAS markets than in global markets (by 0.03 points); no significant differences were identified among the other regional and global markets (Table 4.2). Nevertheless, the test indicates that changes in country competitiveness were significantly lower in all regional markets than in the broader intra-African markets, with differences ranging from 0.024 to 0.069 points, on average.

Results provide clearer insight into Africa's performance in regional markets, with a breakdown of both underperforming and outperforming countries by regional grouping (Table 4.5; Figure 4A.1). More than half of African exporters (26–28 countries) underperformed their competitors in ECCAS, ECOWAS, and SADC markets, with effects being smaller than 1.0. Relatively fewer of African exporters also underperformed in COMESA markets (19 countries). Indeed, at least half of each REC's member countries outperformed their competitors in COMESA markets, recording competitive effects greater than 1.0.

Table 4.5. Breakdown of the number of underperforming and outperforming countries in agricultural export markets by regional economic community

Country grouping	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
			Number of underperforming countries (with a competitive effect < 1.0)			
COMESA members	12	4	4	8	11	6
ECCAS members	10	5	6	8	7	7
ECOWAS members	7	8	6	8	6	12
SADC members	8	3	4	8	8	5
Whole sample	32	20	19	26	27	28
			Number of outperforming countries (with a competitive effect > 1.0)			
COMESA members	6	14	14	8	7	12
ECCAS members	1	6	4	3	4	4
ECOWAS members	8	7	8	7	9	3
SADC members	3	8	7	3	3	6
Whole sample	19	30	29	20	23	22
			Total number of countries in sample			
Whole sample	51	50	48	46	50	50

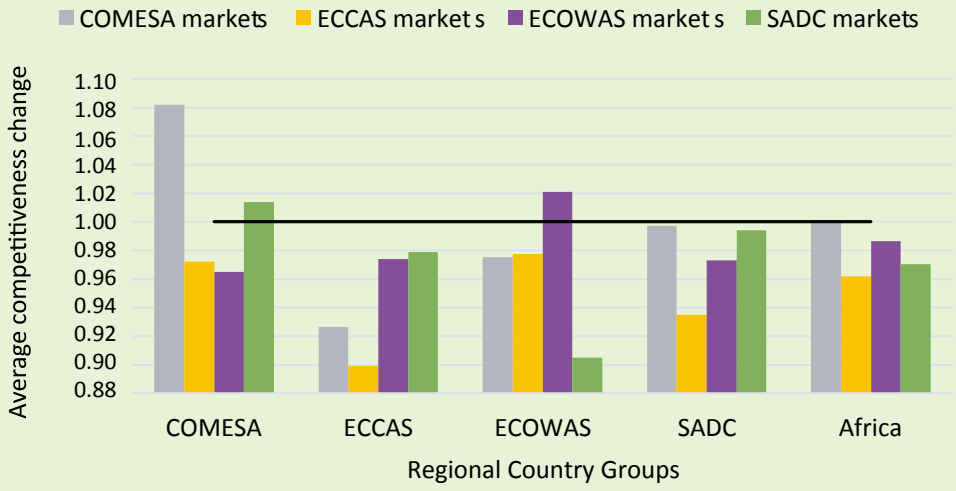
Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

For the COMESA region, for example, only 4 of its members underperformed in their intra-regional markets compared with 11 members in more distant extra-regional ECOWAS markets (Table 4.5, first row of the upper panel). Conversely, up to 14 of COMESA's members outperformed their competitors in their intra-regional markets compared with only 7 members in extra-regional markets within ECOWAS (Table 4.5, first row of the lower panel). Similarly, a smaller number of ECOWAS members underperformed in intra-regional markets than in the remoter extra-regional SADC markets. The same is true for the SADC region, where results show fewer underperforming members in intra-regional markets than in the remoter ECOWAS and ECCAS markets. Surprisingly, however, more ECCAS members underperformed and fewer outperformed in intra-regional markets compared with extra-regional markets.

On average, the change in competitiveness among COMESA members was positive in intra-regional markets, and to a lesser extent in SADC markets, but negative in the more distant ECCAS and ECOWAS markets (Figure 4.10). On average, ECOWAS members also raised their competitiveness in intra-regional markets and reduced their competitiveness in extra-regional markets, with the largest average reduction incurring in the remotest SADC markets. The average competitiveness level of SADC members remained virtually unchanged in intra-regional and COMESA markets, but fell in ECOWAS markets and more notably in ECCAS markets. The patterns are different for the ECCAS region, which underperformed in all regional markets and, more remarkably, in intra-regional markets as well.

Figure 4.10. Average change in competitiveness in regional agricultural export markets, 1998–2013



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

The statistical significance of pairwise comparisons of average changes between regional markets and Africa-wide markets was also tested (Figure 4.10; Tables 4B.1–4B.4 in Appendix 4B). It appears that the COMESA region raised its competitiveness in intra-regional and SADC markets significantly more than the rest of Africa. The ECOWAS region only performed significantly better than the rest of Africa in SADC markets. The ECCAS region underwent a significantly stronger loss of competitiveness compared with the rest of Africa in intra-regional and COMESA markets. These patterns of disparities between regional groups of countries suggest that differences in country competitiveness stem from factors other than trading distance or costs. Differences in the competitiveness of most traded goods in individual countries may have been a contributing factor.

For some commodities, mostly those ranked highest, changes in competitiveness were higher in regional markets than in global and intra-African markets, whereas for other commodities, mostly those ranked lowest, the reverse was true (Figure 4A.2). In order to assess the consistency and significance of these differences, paired-sample T tests of the equality of changes in competitiveness were carried out, comparing regional markets with global and intra-African markets (Table 4.4). Changes in commodity competitiveness in global markets were positively but weakly correlated with changes in COMESA, as well as in ECCAS and SADC markets (Table 4.4, upper panel). No significant correlation was found in changes in competitiveness in global and ECOWAS markets. On average, the changes were lower by 0.037 points in ECCAS markets compared with global markets at the 1 percent significance level, versus 0.020 points in ECOWAS markets at the 10 percent significance level. In contrast, on average, no significant difference was identified in changes in competitiveness in global and COMESA or SADC markets.

The analysis found positive and weak correlations of commodity competitiveness changes in intra-African and intra-regional markets, except for COMESA and SADC, where competitiveness changes were more strongly associated with changes in intra-African markets (Table 4.4, lower panel). This means that the changes in competitiveness among intra-African markets reflect changes in COMESA and SADC significantly more than changes elsewhere in Africa.

On average, changes in the competitiveness of commodities were lower by 0.022 points in ECCAS markets than elsewhere in Africa at the 5 percent significance level.

The loss of competitiveness by African countries affected a greater number of commodities in ECCAS markets compared with the other regional markets (Table 4.6). For a total of 32 commodities, the competitive effect was smaller than 1.0 (including 26 commodities with small losses in competitiveness, but only 6 with high losses).

Conversely, the gains in competitiveness among African exporters benefited a greater number of commodities in COMESA markets compared with other regional markets (up to 31 commodities with small gains, and only 8 with high gains). Nevertheless, the number of commodities with increased competitiveness was still greater in global markets than in regional markets. In other words, room exists to expand Africa's share of total world agricultural exports by aligning changes in competitiveness in regional markets with improvements being made outside Africa.

Table 4.6. Number of commodity groups by class of competitiveness change in agricultural export markets

	Export markets					
Competitiveness class	**Global markets**	**Intra-African markets**	**COMESA markets**	**ECCAS markets**	**ECOWAS markets**	**SADC markets**
Competitive effect <=0.9	0	2	1	6	2	2
0.9 < Competitive effect <=1.0	16	27	19	26	22	24
1.0 < Competitive effect <=1.1	38	23	31	23	30	28
Competitive effect >1.1	5	7	8	4	5	5
Whole sample size	59	59	59	59	59	59

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

Commodities that lost competitiveness in at least three regional markets included cotton, wheat, sorghum, some oilseeds (excluding soybeans and groundnuts), meat and edible offal, groundnut oil, and tea—all of which were also ranked among products with no or low competitiveness gains in intra-African markets and (with the exception of wheat and sorghum) in global markets. Among the highest ranked commodities, many—including rice, potatoes, onions and substitutes, fish and seafood, sheep and goats, other live animals,[9] and roots and tubers—had gained competitiveness in at least three regional markets.

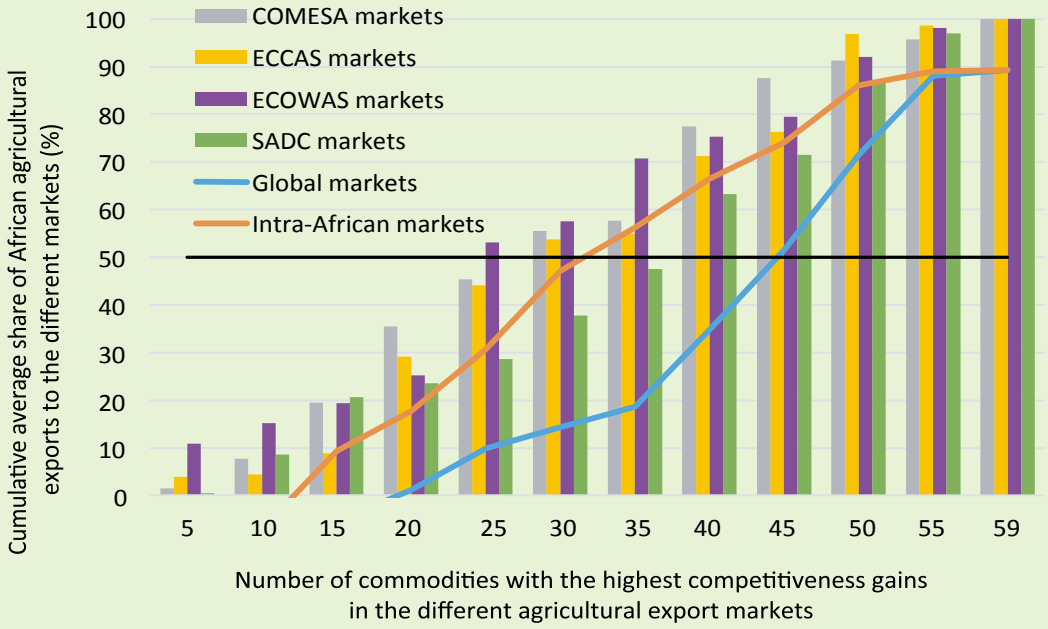
These commodities all gained in competitiveness in global markets (with the exception of fish and seafood), as well as in intra-African markets (with the exception of onions and substitutes and sheep and goats, which lost competitiveness in ECOWAS markets).

In efforts to assess the importance of the highest-ranked commodities, the cumulative share of Africa's total agricultural exports to alternative markets was analyzed in terms of the contributions of the commodities with the highest gains in competitiveness in those markets (Figure 4.11). As in global and intra-African markets, the highest-ranked commodities in regional markets accounted for small shares of African exports to these markets. As already noted, however, the top-ranked commodities represented higher cumulative shares of ex-

[8] This group comprises a broad range of live swine, horses, asses, mules and hinnies.

ports in intra-African markets and in regional markets than in global markets. Results indicate that the top-five and top-ten commodities weighed more heavily in ECOWAS markets than in other intra-African markets. For instance, the top-five commodities in ECOWAS markets accounted for 10.8 percent of Africa's exports to that region, whereas the corresponding shares in all intra-African markets and in global markets were 1.3 and 1.8 percent, respectively. Thus, the products with the highest gains in competitiveness in the different markets are not among the most exported ones, indicating that competitiveness gains occurred among products that could be further exploited by the relevant African countries to increase their export base.

Figure 4.11. Relative importance of commodities with the highest competitiveness gains in regional markets compared with global and intra-African markets

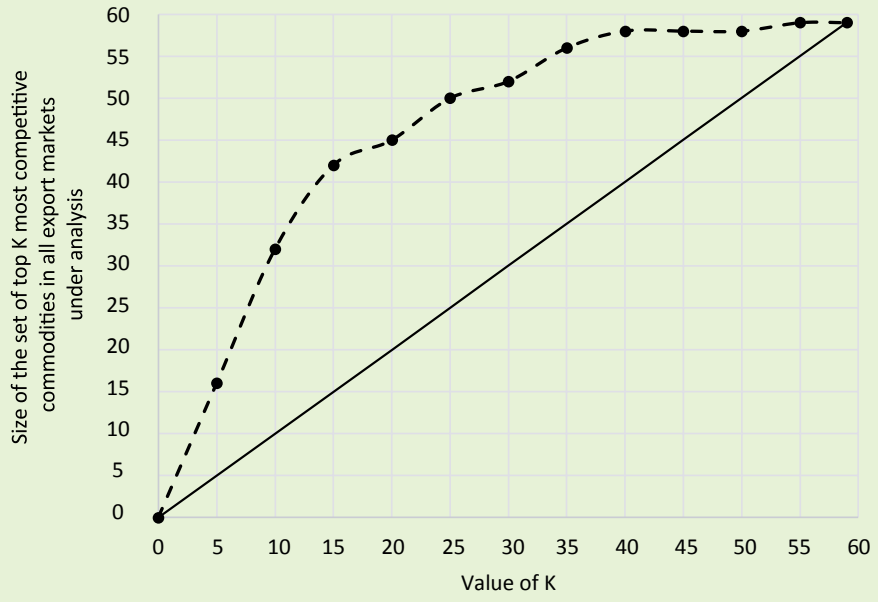


Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

In exploring scope for expansion of exports both within and beyond Africa, it would appear that no single set of commodities gained competitiveness equally in different export markets. In contrast, the commodity rankings are quite dissimilar across markets (Figure 4.12). In those cases where commodity rankings are the same across markets, the top K ranked commodities in each market would be found in a unique set of K products (depicted in the figure by the 45 degree line). The greater the size of the set is than K, the greater the dissimilarity in the various rankings. The distance from the curved line to the straight line indicates the level of dissimilarity among the rankings. For instance, the curved line shows that a set of 16 commodities encompassed the top five across all rankings. Similarly, a set of 32 commodities comprised the top ten across all rankings. In other words, the commodities with the greatest competitiveness gains are not the same across different markets, which justifies the inference that scope exists to expand the export base through commodity diversification in the markets under analysis. More simply, nontraditional export products are gaining competitiveness in different markets and hence are good candidates for export diversification and expansion.

Figure 4.12. Dissimilarity of commodity rankings in the different export markets



Source: Authors' calculations based on CEPII (2015).

Note: The change in competitiveness is measured by the coefficient of the competitive effect derived by decomposition analysis of the commodity-level export share for African countries as a group.

Determinants of Export Competitiveness in Global and Regional Markets

The preceding analyses have highlighted considerable variation across African countries in terms of changes in their competitiveness compared with the group of non-African competitors in agricultural export markets. These patterns of competitiveness changes differ not only across export markets, but also according to membership in the different RECs. Trading distance and costs appear to have affected the changes in competitiveness of REC members in intra-regional compared with extra-regional markets.

Nevertheless, the larger part of the differences across countries appears to have more to do with country-specific production and trade environments than with regional differences. Indeed, the analysis of changes in commodity competitiveness suggests that differences in productivity gains and domestic market conditions may play a large role in the differences in gains or losses of competitiveness achieved by African countries for the different commodities.

This section focuses on the factors causing disparities among countries in terms of changes in their competitiveness in the different markets. Potential determinants considered include changes in total factor productivity, drawing on data from the United States Department of Agriculture; the World Bank's Doing Business–Distance to Frontier indicator; the World Economic Forum's Global Competitiveness Index, and country attributes related to each of its 12 pillars; the International Logistics Performance Index, and its component indicators; and Transparency International's Corruption Perceptions Index.

A linear regression analysis was conducted, whereby the series of changes in country-level competitiveness in the various export markets were pooled to form a single variable, which was then regressed on the country-level indicators noted above taken as potential explanatory variables, controlling for REC membership and export markets (Tables 4.7 and 4.8). This procedure is formally summarized as follows:

$$COMP_{mrj} = \alpha + \sum_r^R \beta_r \cdot REC_r + \sum_j^J \gamma_j \cdot MKT_i + \sum_p^P \theta_p \cdot IND_p + \varepsilon_{mrj} \quad (8)$$

where $COMP_{mrj}$ is the pooled variable standing for the change in competitiveness for country m, which is a member of the regional economic community r, in export markets j. REC_r represents dummy variables for the different RECs, MKT_i are dummy variables for the different export markets, and IND_p stands for the different indicators considered above as potential explanatory variables.

Table 4.7. Parameter estimates for the determinants of changes in country competitiveness

Parameter	Coefficient	Std. Error	t	Sig.
Constant	0.560	0.085	6.612	0.000
SADC region	–0.062	0.016	–3.872	0.000
Intra-African markets	0.039	0.017	2.267	0.025
Doing Business–Distance to Frontier[a]	0.003	0.001	2.242	0.026
Institutions (GCI 1st Pillar)[b]	0.043	0.018	2.316	0.022
Country market size (GCI 10th Pillar)[b]	0.048	0.011	4.182	0.000
Logistics Performance Index, Customs[c]	0.150	0.026	5.815	0.000
Logistics Performance Index, International shipmentsc	–0.128	0.029	–4.396	0.000
Total factor productivity growth estimates, 1961–2012	–1.613	0.949	–1.701	0.091

Source: Authors' calculations.

a. Doing Business–Distance to Frontier, maximum score between 2010 and 2016.
b. Global Competitiveness Index, average attribute value between 2006 and 2015.
c. International Logistics Performance Index (LPI 2014 score).

Table 4.8. Analysis of variance and model summary

	Sum of squares	df	Mean square	F	Sig.
Regression	0.769	8	0.096	12.321	0.000
Residual	1.381	177	0.008		
Total	2.150	185			
Number of observations	186				
R Squared	0.36				
Adjusted R Squared	0.33				
Durbin-Watson	2.36				

Source: Authors' calculations.

A subset of explanatory variables provide the best model fit (Table 4.7). As previously established, changes in country competitiveness are higher in intra-African markets than in global markets. The changes appear to be positively affected by the Doing Business–Distance to Frontier score, the quality of institutions, country market size, and the quality of the customs service. Surprisingly, the model revealed that changes in country competitiveness are negatively associated with the ease of international shipments and changes in total factor productivity. The model accounts for nearly two-fifths of the variation in changes in competitiveness (Table 4.8).

Conclusion

Results of the analysis presented in this chapter indicate, almost consistently, that in all export markets under consideration, ECCAS members underperformed their competitors, on average, whereas SADC, COMESA, and ECOWAS members either maintained their competitiveness or outperformed the group of their competitors. In addition, changes in country competitiveness were, on average, lower in ECCAS markets and generally higher in intra-African markets than in global markets. The analysis also indicates that competitiveness gains for COMESA, ECOWAS, and SADC members were significantly greater in intra-regional markets than in extra-regional markets. For ECCAS, rare increases in country competitiveness occurred in extra-regional markets but not in intra-regional markets. It should be noted, however, that although ECCAS lags behind the other RECs in terms of its competitiveness, the shares of underperforming countries within COMESA, SADC, and ECOWAS are also a concern.

The analysis of Africa's competitiveness at the commodity level revealed significant losses for some important products, although the majority of commodities gained more competitiveness in global markets.

The levels of commodity competitiveness are lower, however, in intra-African than in global markets. They are even lower in regional markets, except in COMESA markets, where the commodity competitiveness level is higher than in global and intra-African markets. In other words, room exists to expand Africa's share of the world's total agricultural exports by aligning changes in competitiveness in regional markets with improvements being made outside Africa. The highest-ranked commodities contribute small shares to the intra-African agricultural export value, and an even smaller share of Africa's global agricultural export value. This further reflects scope for expanding African exports by exploiting increased competitiveness among new and emerging export products. The results show that the set of these potential products for export expansion varies remarkably across the different export markets, showing scope for product diversification by countries in conquering both African and world markets. Apart from REC membership, the Doing Business–Distance to Frontier score, the quality of domestic institutions, country market size, and the quality of customs service were shown to be significant contributors to variability in changes in competitiveness.

References

CEPII (Centre d'Etudes Prospectives et d'Informations Internationales). 2015. "BACI: The International Trade Database at the Product Level." Accessed April 2017. www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=1.

Cheptea, A., G. Gaulier, G., and S. Zignago. 2005. *World Trade Competitiveness: A Disaggregated View by Shift-Share Analysis*. CEPII Working Paper 2005-23. Paris: Centre d'Etudes Prospectives et d'Informations Internationales.

Hausman, R., J. Hwang, and D. Rodrik. 2005. "What You Export Matters." *Journal of Economic Growth* 12 (1): 1–25.

Leamer, E., and R. Stern. 1970. *Quantitative International Economics*. Aldine.

Magee, S. 1975. "Prices, Income, and Foreign Trade." In *International Trade and Finance: Frontiers for Research*, edited by P. Kenen. New York: Cambridge University Press.

Richardson, J. 1971a. "Constant-Market-Shares Analysis of Export Growth." *Journal of International Economics* 1 (2): 227–239.

_____. 1971b. "Some Sensitivity Tests for a 'Constant Market Shares Analysis' of Export Growth." *Review of Economics and Statistics* 53: 300–304.

Tyszynski, H. 1951. "World Trade in Manufactured Commodities, 1899–1950." *The Manchester School of Economic and Social Studies* 19: 222–304

Appendix 4A. Supplementary Tables and Figures

Appendix Table 4A.1. Change in competitiveness by country and agricultural export market, 1998–2013

Country	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
Algeria	1.111	1.212	1.083	1.050	1.163	1.051
Angola	0.882	1.025	0.757	0.796	1.005	0.978
Benin	0.959	0.914	1.110	0.914	0.913	0.992
Burkina Faso	1.033	0.993	0.832	1.075	1.053	0.724
Burundi	0.976	1.183	1.089	1.037	0.900	1.071
Cameroon	0.984	0.966	0.841	0.971	0.964	0.865
Cabo Verde	1.211	1.092	1.110	1.039	1.083	0.892
Central African Republic	0.903	0.818	0.715	0.706	0.948	0.859
Chad	0.900	0.859	0.958	0.650	1.067	0.931
Comoros	0.984	1.235	1.148	0.812	0.725	1.128
Congo	0.974	1.042	0.774	0.931	0.937	1.102
Côte d'Ivoire	0.976	0.971	1.032	0.976	0.999	0.895
Dem. Rep. of Congo	0.939	1.071	1.087	1.027	0.972	0.911
Djibouti	1.104	1.236	1.178		1.095	0.940
Egypt	1.098	1.232	1.198	1.115	1.084	1.080
Equatorial Guinea	0.758	1.073		0.850	1.141	1.057
Eritrea	0.949	1.171	1.189		1.092	1.017
Ethiopia	1.071	1.203	1.110	1.107	1.057	1.103
Gabon	0.918	0.990	1.016	0.956	0.841	0.915
Gambia	0.986	1.022	0.991	0.879	1.040	0.849
Ghana	1.065	1.163	1.133	1.051	1.191	0.992
Guinea	0.966	1.011	1.010	0.772	1.066	0.837
Guinea-Bissau	1.035	1.163		0.893	1.206	1.085
Kenya	0.987	0.976	0.980	0.939	0.952	0.997
Liberia	1.053	0.975	0.897	1.107	1.069	0.900
Libya	0.963	0.973	1.233	0.990	0.717	1.057
Madagascar	0.944	0.947	0.949	0.792	0.944	0.902
Malawi	0.984	1.004	1.061	1.032	1.003	1.013
Mali	0.931	0.805	0.703	0.859	0.779	0.717
Mauritania	0.995	1.030	1.073	1.033	1.012	1.177
Mauritius	0.971	1.024	1.020	0.758	0.967	1.055
Morocco	0.997	1.134	1.093	1.078	1.161	1.099
Mozambique	1.027	1.029	1.069	0.986	0.871	1.030
Niger	1.009	0.941	0.827	0.884	0.941	0.963
Nigeria	1.093	1.088	1.040	1.127	1.046	1.093
Rwanda	1.067	1.175	1.197	1.070	1.037	1.158
SACU countries	0.986	0.975	0.983	0.950	0.992	0.971
Saint Helena	0.995	0.731	0.719		0.841	0.822
São Tomé and Príncipe	0.901	0.905	0.829	0.897	0.902	0.921
Senegal	0.971	1.044	1.099	1.019	1.074	1.029
Seychelles	0.982	1.027	1.084	0.966	0.889	1.032
Sierra Leone	1.045	0.963	1.060	1.135	0.920	0.734
Somalia	1.125	0.906	0.956		0.775	0.937
Sudan	0.968	1.008	0.996	1.016	0.877	0.743
Tanzania	1.004	1.027	1.025	1.125	0.965	1.056
Togo	0.995	0.950	0.807	0.934	0.937	0.871
Tunisia	1.022	1.176	1.044	1.047	1.063	0.930
Uganda	1.003	1.015	1.023	1.040	0.961	1.052
Western Sahara	0.853					
Zambia	1.062	1.051	1.091	0.996	1.196	1.069
Zimbabwe	0.916	0.915	0.841	0.857	0.901	0.919

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Table 4A.2. Share of Africa's agricultural export value by country and market, 1998–2013 average

Exporting country	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
Algeria	0.411	0.775	0.423	0.025	1.829	0.018
Angola	0.110	0.090	0.000	0.040	0.194	0.095
Benin	0.890	1.362	0.060	0.141	4.516	0.197
Burkina Faso	1.103	1.760	0.215	0.004	5.752	0.187
Burundi	0.178	0.097	0.167	0.177	0.014	0.078
Cameroon	2.399	1.098	0.203	5.239	0.333	0.288
Cabo Verde	0.054	0.031	0.001	0.002	0.054	0.001
Central African Republic	0.078	0.076	0.098	0.193	0.040	0.030
Chad	0.261	0.108	0.023	0.429	0.048	0.027
Comoros	0.093	0.017	0.028	0.001	0.001	0.041
Congo	0.145	0.272	0.032	1.474	0.053	0.063
Côte d'Ivoire	12.225	7.124	0.227	2.476	17.027	1.301
Dem. Rep. of Congo	0.149	0.160	0.293	0.260	0.027	0.040
Djibouti	0.137	0.276	0.552	0.000	0.006	0.010
Egypt	6.463	5.082	6.420	1.715	1.363	0.978
Equatorial Guinea	0.054	0.003	0.000	0.005	0.004	0.000
Eritrea	0.016	0.012	0.027	0.001	0.001	0.000
Ethiopia	2.894	2.887	3.490	0.045	0.057	0.227
Gabon	0.114	0.337	0.001	2.228	0.034	0.010
Gambia	0.124	0.137	0.003	0.012	0.481	0.032
Ghana	5.336	1.224	0.072	0.306	4.106	0.150
Guinea	0.344	0.610	0.008	0.030	1.416	0.006
Guinea-Bissau	0.256	0.079	0.000	0.049	0.265	0.001
Kenya	5.974	7.380	13.475	3.592	0.573	4.468
Liberia	0.031	0.021	0.002	0.001	0.038	0.002
Libya	0.095	0.106	0.034	0.006	0.030	0.002
Madagascar	1.577	0.374	0.538	0.012	0.046	0.555
Malawi	2.030	2.331	2.854	0.335	0.154	3.982
Mali	1.125	3.068	0.286	0.005	10.757	0.340
Mauritania	1.557	2.712	0.057	3.888	8.192	0.026
Mauritius	1.889	0.841	1.347	0.070	0.591	1.540
Morocco	8.839	3.478	1.571	5.033	6.251	1.268
Mozambique	1.251	1.593	2.236	0.084	0.029	4.148
Niger	0.557	2.491	0.081	0.022	8.917	0.008
Nigeria	3.433	1.308	0.159	0.719	3.183	0.647
Rwanda	0.273	0.621	1.263	0.973	0.004	0.566
SACU countries	19.025	25.132	30.421	43.820	10.880	50.927
Saint Helena	0.024	0.005	0.006	0.000	0.001	0.005
São Tomé and Príncipe	0.028	0.005	0.004	0.012	0.006	0.003
Senegal	1.774	2.417	0.062	2.858	6.608	0.050
Seychelles	0.885	0.441	0.875	0.001	0.055	1.086
Sierra Leone	0.091	0.017	0.002	0.001	0.027	0.007
Somalia	0.342	0.077	0.057	0.000	0.194	0.004
Sudan	1.437	1.098	2.187	0.003	0.013	0.090
Tanzania	2.882	2.521	4.754	5.161	0.144	2.487
Togo	0.819	1.163	0.025	0.262	3.695	0.044
Tunisia	3.112	4.430	7.082	0.796	1.664	0.115
Uganda	2.509	3.945	7.772	8.026	0.191	2.210
Western Sahara	0.006	0.004	0.000	0.000	0.015	0.000
Zambia	1.260	4.079	6.675	7.993	0.015	10.422
Zimbabwe	3.344	4.728	3.829	1.476	0.105	11.216
Africa	100	100	100	100	100	100

Source: Authors' calculations based on CEPII (2015).

Table 4A.3. Change in competitiveness by commodity and agricultural export market, 1998–2013

Export commodity	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
Cattle	1.130	1.058	1.129	0.996	1.000	0.980
Sheep and goats	1.092	0.949	1.051	1.010	0.999	1.036
Poultry	0.955	0.994	1.018	0.967	1.029	0.983
Other live animals	1.063	1.035	1.040	0.951	1.016	1.013
Meat and edible offal	0.951	0.949	0.991	0.918	1.009	0.918
Fish and sea foods	0.986	1.020	1.033	0.979	1.025	1.045
Dairy, eggs, and honey	1.116	1.040	1.074	0.972	1.030	0.976
Other animal products	1.003	1.017	1.036	0.983	1.026	1.026
Roots and tubers	1.097	1.101	1.043	1.103	0.954	1.012
Other live trees and plants	1.055	0.990	1.031	0.997	0.942	1.004
Potatoes	1.034	1.035	0.967	1.015	1.066	1.002
Tomatoes	1.036	1.022	1.006	0.993	1.072	0.999
Onions and substitutes	1.054	0.949	1.021	1.030	0.905	1.019
Other edible vegetables	1.062	1.110	1.102	0.983	0.993	1.013
Edible fruits and nuts	1.009	0.996	0.980	1.005	1.016	1.006
Coffee	0.961	0.963	0.945	0.926	1.032	1.001
Tea	0.995	0.998	1.005	0.859	0.961	0.998
Spices	0.984	1.028	1.047	1.062	0.985	0.985
Wheat	1.050	0.990	0.934	0.997	1.177	0.933
Rye, barley, and oats	1.216	1.243	1.140	1.045	0.846	1.382
Maize	1.031	0.987	0.991	1.035	0.971	1.033
Rice	1.019	1.037	1.042	1.017	1.023	1.071
Sorghum	1.030	0.967	0.950	0.798	0.968	1.007
Other cereals	0.993	0.985	0.976	1.006	1.020	0.974
Milling industry products	1.026	1.042	1.062	1.027	1.047	1.005
Soybeans	1.073	0.884	0.842	0.887	1.052	1.040
Groundnuts	1.005	0.998	1.089	0.992	1.016	1.014
Other oilseeds	1.014	0.967	0.954	0.997	1.034	0.975
Medicinal plants	1.044	1.019	1.016	0.946	0.992	0.998
Gums and resins	1.000	1.163	1.080	0.974	1.024	1.099
Vegetable plaiting materials	1.027	1.067	0.975	1.047	0.921	1.132
Animal fats	1.096	1.059	1.147	1.115	1.015	1.047
Soybean oil	1.148	1.138	1.147	1.162	1.246	1.068
Groundnut oil	0.943	0.935	1.004	0.935	0.949	0.992
Olive oil	1.013	1.173	1.205	1.073	1.250	1.164
Palm oil	0.985	0.988	1.066	0.925	0.921	1.026
Other oils and facts	1.066	1.071	1.063	1.080	1.033	1.041
Edible preps. of meat, fish and crustaceans	0.995	1.021	1.009	1.014	1.084	0.986
Cane sugar	0.963	1.002	1.001	1.009	0.982	0.977
Sugar confectionery	1.010	0.984	0.994	0.985	0.970	0.980
Cocoa beans	1.002	0.945	1.009	1.068	1.012	0.944
Cocoa preparations	1.039	0.987	0.991	1.012	1.039	0.982
Preps. of cereals, flour, starch or milk	1.087	1.016	1.041	0.997	1.011	1.011
Preps. of vegs., fruits and nuts	0.997	1.029	1.022	1.043	1.067	0.986
Misc. edible preparations	1.018	1.015	1.025	0.999	1.021	0.982
Beverages, spirits, and vinegar	1.022	0.988	1.037	0.948	1.005	0.971
Residues from food industries	1.038	1.039	1.100	0.970	0.955	1.003
Tobacco and substitutes	1.035	1.042	1.044	1.029	1.110	0.997
Organic chemicals	0.952	0.859	0.901	0.898	0.821	0.873
Essential oils and resinoids	1.009	0.974	0.980	0.995	0.976	0.968
Albuminoidal substances	1.038	0.999	0.960	1.078	1.030	1.011
Finishing agents for textiles and paper	1.029	0.947	0.995	1.075	0.933	1.009

Export commodity	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
Hides and skins	0.993	1.088	0.963	1.030	0.920	1.235
Furskins	1.020	0.989	1.070	0.870	1.050	1.122
Silk	1.126	0.944	1.205	1.125	0.994	0.942
Wool	1.078	1.049	1.020	1.000	1.073	0.862
Cotton, not carded or combed	0.961	0.951	0.937	0.878	0.967	0.999
Cotton, carded or combed	1.009	0.988	0.997	0.907	0.911	1.012
Other vegetable textile fibers	1.015	1.130	1.149	0.905	1.140	1.023

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

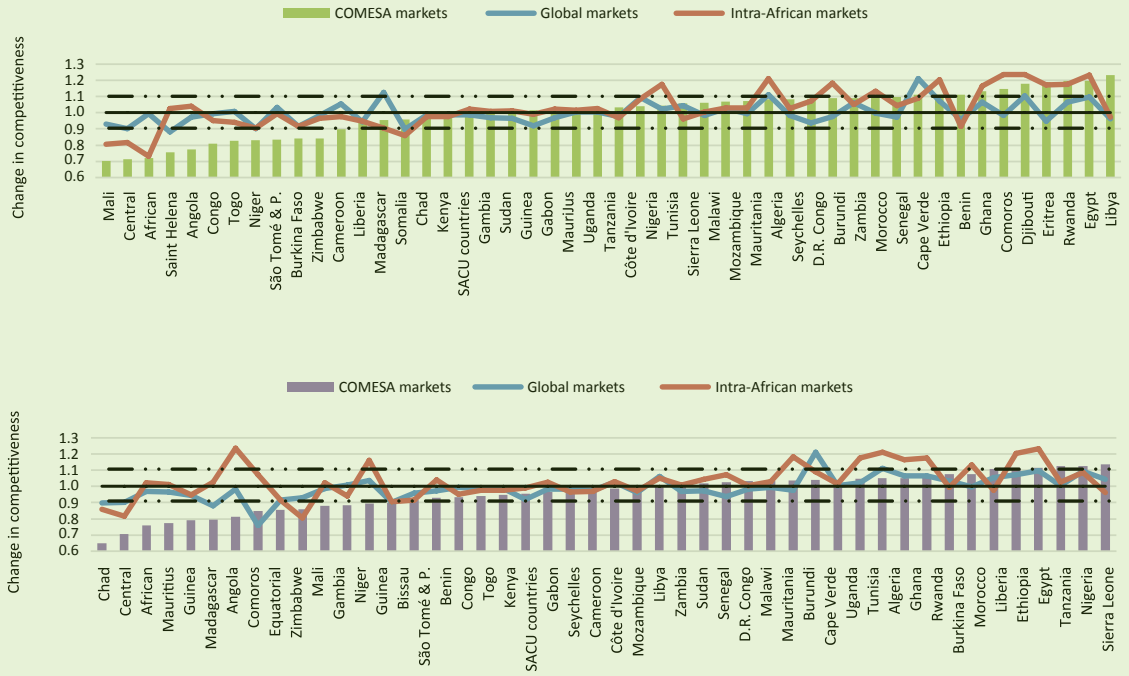
Table 4A.4. Share of Africa's agricultural export value by commodity and market, 1998–2013 average

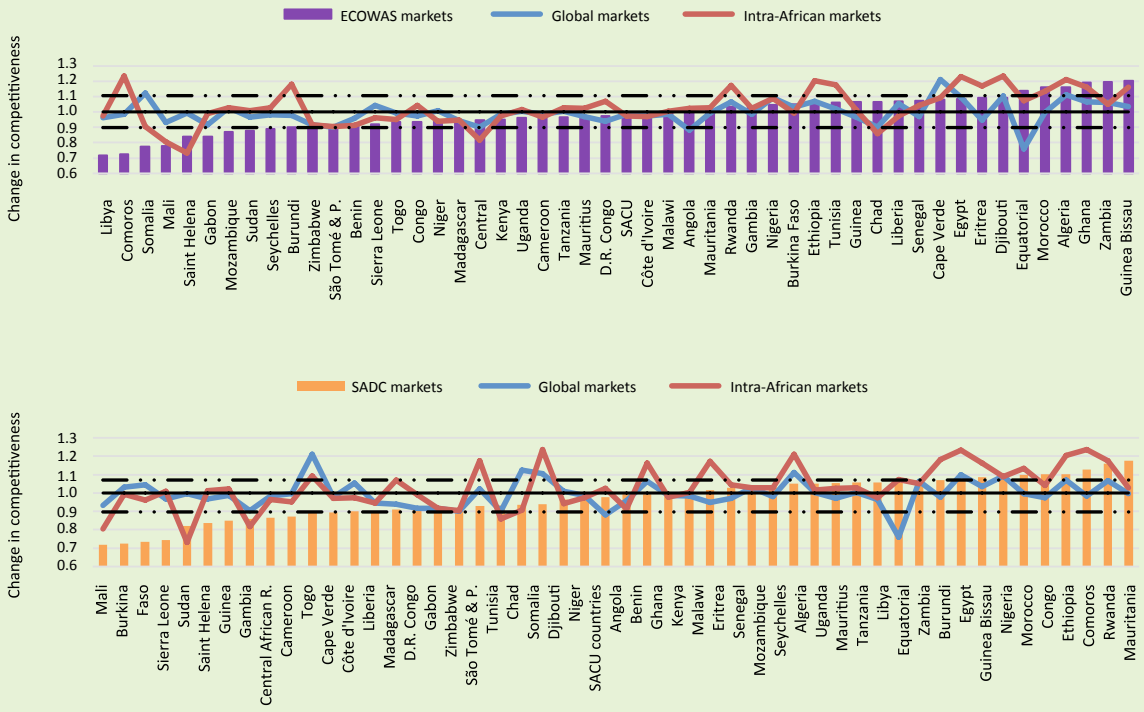
Export commodity	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
Cattle	0.41	1.623	0.875	0.439	4.098	0.686
Sheep and goats	0.61	0.686	0.076	0.065	2.517	0.040
Poultry	0.02	0.120	0.104	0.043	0.033	0.229
Other live animals	0.29	0.477	0.708	0.081	0.454	0.225
Meat and edible offal	0.88	0.871	0.630	1.249	1.005	1.451
Fish and sea foods	11.66	7.599	3.512	11.800	15.716	5.486
Dairy, eggs, and honey	1.18	3.171	3.520	3.693	2.804	3.675
Other animal products	0.37	0.228	0.196	0.035	0.530	0.200
Roots and tubers	0.04	0.015	0.021	0.006	0.023	0.006
Other live trees and plants	2.14	0.468	0.432	0.321	0.162	0.344
Potatoes	0.51	0.343	0.294	0.851	0.051	0.651
Tomatoes	0.87	0.107	0.103	0.058	0.102	0.087
Onions and substitutes	0.37	0.649	0.224	0.606	1.643	0.396
Other edible vegetables	3.35	2.800	2.616	1.769	1.461	1.793
Edible fruits and nuts	12.77	2.786	2.052	1.663	3.277	2.596
Coffee	4.66	3.852	2.377	0.584	0.509	0.832
Tea	2.68	5.216	10.621	1.014	0.563	1.775
Spices	1.01	0.532	0.584	0.138	0.162	0.563
Wheat	0.19	0.932	1.532	0.305	0.792	1.521
Rye, barley, and oats	0.02	0.066	0.094	0.071	0.003	0.101
Maize	0.91	3.824	6.990	2.108	0.671	7.104
Rice	0.72	1.625	2.064	1.267	2.520	0.918
Sorghum	0.06	0.185	0.331	0.050	0.090	0.214
Other cereals	0.05	0.195	0.199	0.066	0.319	0.110
Milling industry products	0.74	4.008	6.087	8.829	2.953	5.924
Soybeans	0.07	0.225	0.380	0.445	0.011	0.351
Groundnuts	0.27	0.417	0.308	0.242	0.246	0.579
Other oilseeds	1.73	1.252	1.402	0.236	0.865	0.859
Medicinal plants	0.94	0.693	0.857	0.594	0.400	0.961
Gums and resins	0.67	0.376	0.280	0.813	0.385	0.180
Vegetable plaiting materials	0.22	0.849	1.010	0.015	0.009	0.077
Animal fats	0.11	0.102	0.146	0.025	0.098	0.157
Soybean oil	0.18	0.729	1.187	0.264	0.169	1.324
Groundnut oil	0.26	0.023	0.012	0.016	0.033	0.024
Olive oil	1.14	0.175	0.196	0.232	0.026	0.189
Palm oil	0.56	2.699	1.977	3.212	5.753	1.725

Export commodity	Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
Other oils and facts	1.02	3.858	6.063	3.672	2.365	4.370
Edible preps. of meat, fish and crustaceans	3.56	1.889	1.081	4.429	2.896	1.755
Cane sugar	3.85	6.382	8.727	9.292	1.785	8.471
Sugar confectionery	0.62	1.691	1.474	2.496	1.595	2.008
Cocoa beans	12.18	0.570	0.012	0.010	0.342	0.416
Cocoa preparations	3.68	1.100	1.064	1.171	0.453	1.612
Preps. of cereals, flour, starch or milk	0.70	2.825	2.888	2.584	3.501	2.770
Preps. of vegs., fruits and nuts	2.39	2.069	2.674	1.614	1.244	2.458
Misc. edible preparations	1.62	5.366	3.301	5.065	8.795	4.087
Beverages, spirits, and vinegar	3.11	5.578	3.964	16.045	4.270	9.001
Residues from food industries	1.05	2.319	2.314	0.509	0.948	2.835
Tobacco and substitutes	5.88	9.696	9.181	9.321	9.861	10.510
Organic chemicals	0.00	0.004	0.008	0.002	0.001	0.010
Essential oils and resinoids	0.27	0.083	0.097	0.059	0.031	0.174
Albuminoidal substances	0.03	0.094	0.142	0.090	0.052	0.157
Finishing agents for textiles and paper	0.00	0.018	0.034	0.004	0.006	0.038
Hides and skins	0.76	0.169	0.176	0.010	0.082	0.119
Furskins	0.02	0.002	0.001	0.001	0.001	0.004
Silk	0.00	0.002	0.003	0.001	0.000	0.006
Wool	0.47	0.037	0.074	0.001	0.003	0.053
Cotton, not carded or combed	5.69	5.971	2.366	0.270	11.073	5.398
Cotton, carded or combed	0.35	0.359	0.359	0.156	0.270	0.394
Other vegetable textile fibers	0.05	0.002	0.002	0.001	0.001	0.001
Agricultural exports	100	100	100	100	100	100

Source: Authors' calculations based on CEPII (2015).

Figure 4A.1. Change in competitiveness of countries in regional exports markets compared with global and intra-African markets by REC, 1998–2013

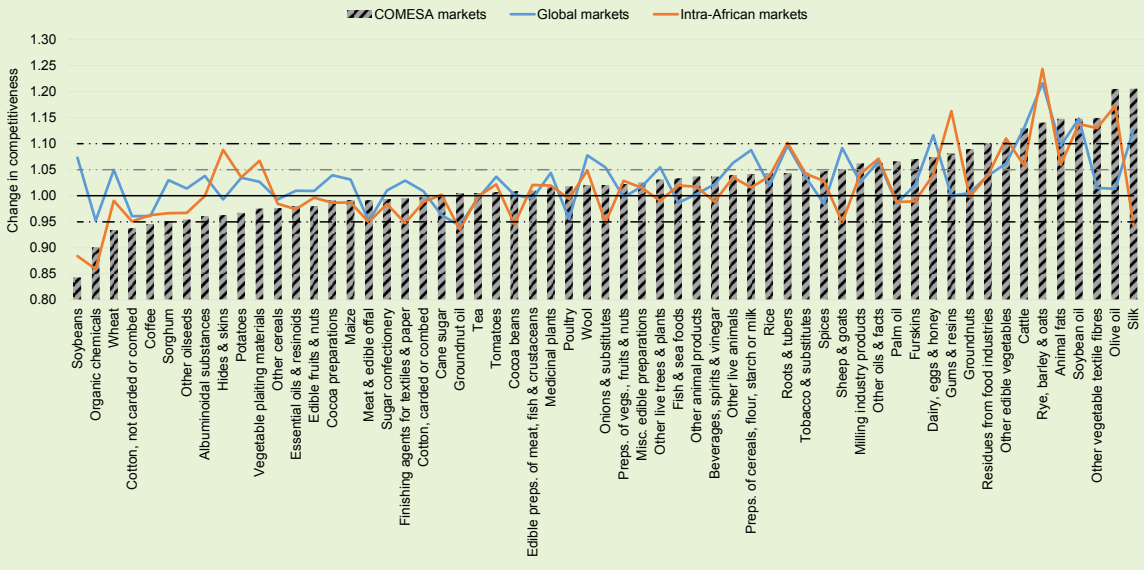


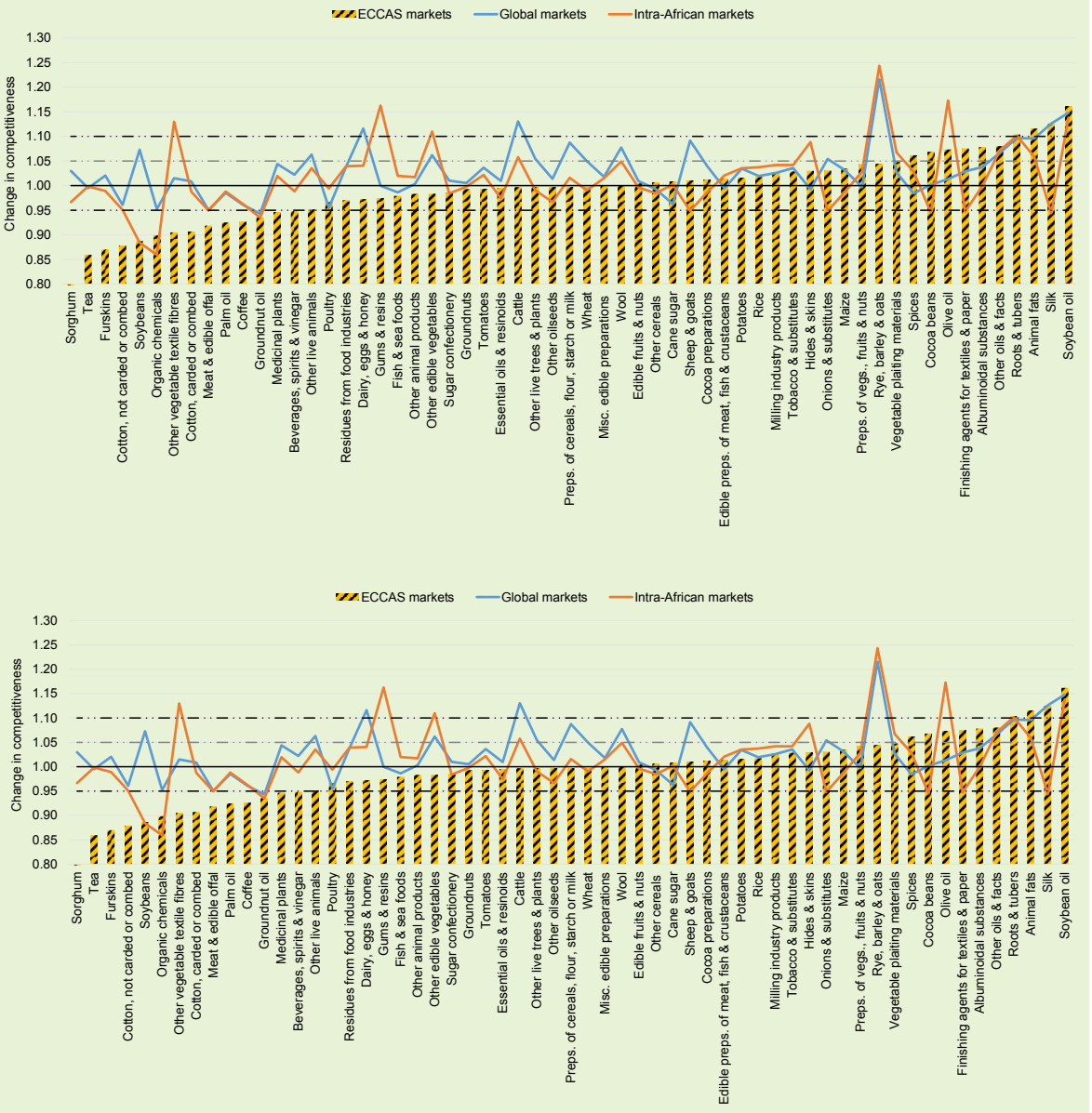


Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Figure 4A.2. Change in competitiveness of commodities in regional export markets compared with global and intra-African markets by REC, 1998–2013

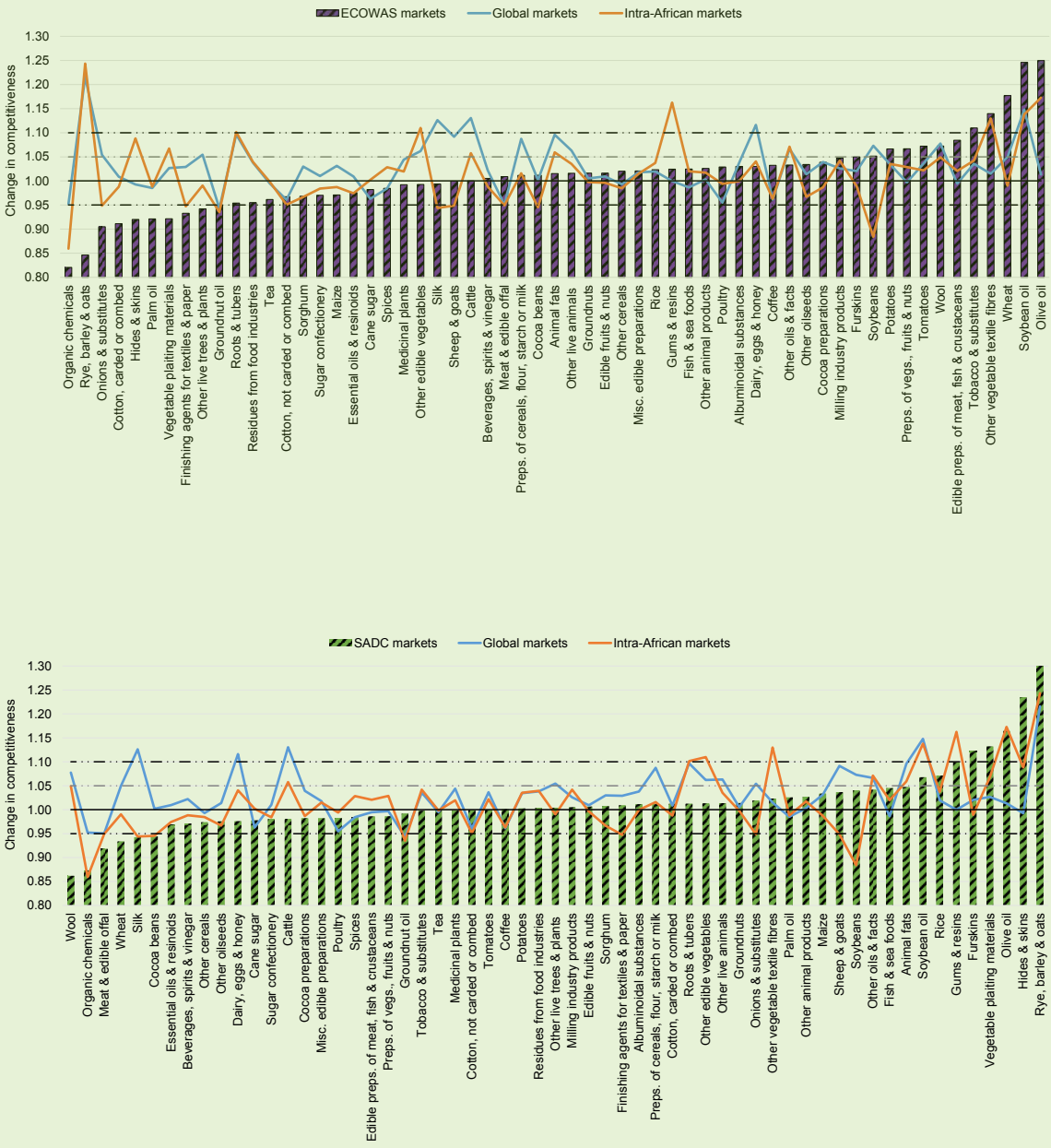




Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

Figure 4A.2. Continued



Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group.

Appendix 4B. Statistical Tests

The series of competitive effect values derived for all countries and commodities and for different export markets were used to carry out two statistical comparison procedures. The first, an analysis of variance (ANOVA), was used to test the hypothesis that the means of competitiveness changes are equal across country groups. The second, the paired-samples T test, was used to test the hypothesis that changes in competitiveness in two export markets are equal. These tests were run for changes in both country and commodity competitiveness. Results are presented in Tables 4A.1–4A.4 in Appendix A, and in Tables 4B.1–4B.4 below.

Prior to running these procedures, the one-sample Kolmogorov-Smirnov test was first performed to confirm the assumption of the normality of the distribution of competitiveness change indices in each of the country groups under comparison. The same test was carried out to check the assumption that, for each pair of export markets, the differences in competitiveness changes in those markets follow a normal distribution. The Levene's homogeneity-of-variance test was also used to check the assumption that the country groups under comparison come from populations with equal variances. In the large majority of comparisons, the Levene's test confirmed an equality of variances across groups, allowing the performance of an ANOVA procedure using the standard F statistic. However, in the rare comparisons where variances were significantly different, a robust ANOVA procedure using the Welch statistic was also performed to check whether the p value associated with the standard ANOVA F statistic could be trusted. The results of the Kolmogorov-Smirnov test and the Levene's test are presented in Tables 4B.5– 4B.8.

Table 4B.1. Analysis of variance in changes in competitiveness of COMESA members in agricultural export markets, 1998–2013

Country group	Sum of squares		df	Mean square	F	Sig.	Eta squared
COMESA vs. non-COMESA countries	Between groups	0.187	1	0.187	11.970	0.001	0.206
	Within groups	0.720	46	0.016			
	Total	0.907	47				
ECCAS vs. non-ECCAS countries	Between groups	0.071	1	0.071	3.904	0.054	0.078
	Within groups	0.836	46	0.018			
	Total	0.907	47				
ECOWAS vs. non-ECOWAS countries	Between groups	0.014	1	0.014	0.697	0.408	0.015
	Within groups	0.893	46	0.019			
	Total	0.907	47				
SADC vs. non-SADC countries	Between groups	0.000	1	0.000	0.013	0.909	0.000
	Within groups	0.907	46	0.020			
	Total	0.907	47				

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Table 4B.2. Analysis of variance in changes in competitiveness of ECCAS members in agricultural export markets, 1998–2013

Country group	Sum of squares		df	Mean square	F	Sig.	Eta squared
COMESA vs. non-COMESA countries	Between groups	0.003	1	0.003	0.182	0.672	0.004
	Within groups	0.629	44	0.014			
	Total	0.631	45				
ECCAS vs. non-ECCAS countries	Between groups	0.057	1	0.057	4.346	0.043	0.090
	Within groups	0.574	44	0.013			
	Total	0.631	45				
ECOWAS vs. non-ECOWAS countries	Between groups	0.006	1	0.006	0.389	0.536	0.009
	Within groups	0.626	44	0.014			
	Total	0.631	45				
SADC vs. non-SADC countries	Between groups	0.010	1	0.010	0.737	0.395	0.016
	Within groups	0.621	44	0.014			
	Total	0.631	45				

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Table 4B.3. Analysis of variance in changes in competitiveness of ECOWAS members in agricultural export markets, 1998–2013

Country group	Sum of squares		df	Mean square	F	Sig.	Eta squared
COMESA vs. non-COMESA countries	Between groups	0.013	1	0.013	0.978	0.328	0.020
	Within groups	0.652	48	0.014			
	Total	0.665	49				
				0.002	0.164	0.687	0.003
ECCAS vs. non-ECCAS countries	Between groups	0.002	1	0.014			
	Within groups	0.663	48				
	Total	0.665	49	0.025	1.908	0.174	0.038
				0.013			
ECOWAS vs. non-ECOWAS countries	Between groups	0.025	1				
	Within groups	0.640	48	0.003	0.186	0.668	0.004
	Total	0.665	49	0.014			
SADC vs. non-SADC countries	Between groups	0.003	1				
	Within groups	0.663	48				
	Total	0.665	49				

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Table 4B.4. Analysis of variance in changes in competitiveness of SADC members in agricultural export markets, 1998–2013

Country group	Sum of squares		df	Mean square	F	Sig.	Eta squared
COMESA vs. non-COMESA countries	Between groups	0.053	1	0.053	4.369	0.042	0.083
	Within groups	0.579	48	0.012			
	Total	0.632	49				
				0.001	0.077	0.782	0.002
ECCAS vs. non-ECCAS countries	Between groups	0.001	1	0.013			
	Within groups	0.631	48				
	Total	0.632	49	0.092	8.184	0.006	0.146
				0.011			
ECOWAS vs. non-ECOWAS countries	Between groups	0.092	1				
	Within groups	0.540	48	0.008	0.612	0.438	0.013
	Total	0.632	49	0.013			
SADC vs. non-SADC countries	Between groups	0.008	1				
	Within groups	0.624	48				
	Total	0.632	49				

Source: Authors' calculations based on CEPII (2015).

Note: Change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries.

Table 4B.5. One-Sample Kolmogorov-Smirnov tests of normality of the distributions of changes in competitiveness by country group

Test group		Export destination markets: Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
COMESA countries	Kolmogorov-Smirnov Z	1.039	0.793	0.506	0.756	0.536	0.695
	Asymp. Sig. (2-tailed)	0.231	0.555	0.960	0.617	0.937	0.720
Non-COMESA countries	Kolmogorov-Smirnov Z	0.672	0.531	0.887	0.542	0.450	0.435
	Asymp. Sig. (2-tailed)	0.757	0.940	0.412	0.931	0.987	0.991
ECCAS countries	Kolmogorov-Smirnov Z	0.624	0.378	0.621	0.456	0.483	0.752
	Asymp. Sig. (2-tailed)	0.831	0.999	0.835	0.985	0.974	0.625
Non-ECCAS countries	Kolmogorov-Smirnov Z	0.892	0.970	0.837	0.664	0.568	0.744
	Asymp. Sig. (2-tailed)	0.404	0.303	0.486	0.770	0.904	0.638
ECOWAS countries	Kolmogorov-Smirnov Z	0.514	0.433	0.708	0.463	0.650	0.463
	Asymp. Sig. (2-tailed)	0.954	0.992	0.698	0.983	0.792	0.983
Non-ECOWAS countries	Kolmogorov-Smirnov Z	0.775	0.752	0.752	0.751	0.421	0.775
	Asymp. Sig. (2-tailed)	0.585	0.623	0.624	0.626	0.994	0.586
SADC countries	Kolmogorov-Smirnov Z	0.414	0.888	0.729	0.620	0.883	0.576
	Asymp. Sig. (2-tailed)	0.995	0.410	0.663	0.836	0.416	0.894
Non-SADC countries	Kolmogorov-Smirnov Z	0.717	0.771	0.715	0.800	0.831	0.736
	Asymp. Sig. (2-tailed)	0.683	0.591	0.685	0.544	0.495	0.651

Source: Authors' calculations based on CEPII (2015).

Note: The change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries. The probability of the Z statistic is above 0.05, meaning that the normal distribution is a good fit for competitiveness changes for the different country groups tested and across all export destinations.

Table 4B.6. One-Sample Kolmogorov-Smirnov tests of normality of the distributions of the differences in changes in the competitiveness of countries by pairs of export markets

Pairs of markets	N	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
COMESA and global markets	48	0.973	0.300
ECCAS and global markets	46	0.796	0.551
ECOWAS and global markets	50	0.722	0.675
SADC and global markets	50	0.759	0.612
Intra-African and global markets	50	0.593	0.874
COMESA and intra-African markets	48	0.747	0.632
ECCAS and intra-African markets	46	0.899	0.394
ECOWAS and intra-African markets	50	0.824	0.505
SADC and intra-African markets	50	0.936	0.345

Source: Authors' calculations based on CEPII (2015).

Note: The change in competitiveness is measured by the coefficient of the competitive effect derived from export share decomposition analysis for individual countries. The probability of the Z statistic is above 0.05, meaning that the normal distribution is a good fit for the differences of competitiveness changes in pairs of export destination markets

Table 4B.7. One-Sample Kolmogorov-Smirnov tests of normality of the distributions of the differences in changes in the competitiveness of commodities by pairs of export markets

Pairs of markets	N	Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
COMESA and global markets	59	0.626	0.828
ECCAS and global markets	59	1.023	0.246
ECOWAS and global markets	59	0.665	0.769
SADC and global markets	59	1.058	0.213
Intra-African and global markets	59	0.780	0.577
COMESA and intra-African markets	59	1.051	0.219
ECCAS and intra-African markets	59	0.747	0.631
ECOWAS and intra-African markets	59	1.073	0.200
SADC and intra-African markets	59	0.792	0.557

Source: Authors' calculations based on CEPII (2015).

Notes: The change in competitiveness is measured by the coefficient of the competitive effect derived from commodity-level export share decomposition analysis for African countries as a group. The probability of the Z statistic is above 0.05, meaning that the normal distribution is a good fit for the differences of competitiveness changes in pairs of export destination markets.

Table 4B.8. Levene's test for homogeneity of variance of changes in competitiveness of countries by pairs of country groups

Country groups		Export destination markets					
		Global markets	Intra-African markets	COMESA markets	ECCAS markets	ECOWAS markets	SADC markets
COMESA vs. non-COMESA countries	Levene Statistic	0.834	0.543	4.551	0.201	0.000	0.897
	Sig.	0.366	0.465	0.038*	0.656	0.994	0.348
ECCAS vs. non-ECCAS countries	Levene Statistic	0.127	0.034	2.926	0.900	2.294	0.247
	Sig.	0.723	0.854	0.094*	0.348	0.136	0.621
ECOWAS vs. non-ECOWAS countries	Levene Statistic	0.044	1.042	0.060	0.019	0.069	0.655
	Sig.	0.834	0.312	0.807	0.890	0.793	0.422
SADC vs. non-SADC countries	Levene Statistic	1.370	9.432	1.710	0.006	4.206	6.343
	Sig.	0.247	0.004*	0.198	0.939	0.046*	0.015*

5. DETERMINANTS OF AFRICAN AGRICULTURAL EXPORTS

Getaw Tadesse and Ousmane Badiane

Trade is an important engine for economic growth, food security, poverty reduction, and overall development. It is also a complex and sensitive subject for policymaking because it involves negotiations, dialogues, and agreements among partner countries across a variety of sociopolitical boundaries. Trade issues become more complicated in the context of agriculture, a sector that profoundly relies on social and ecological dynamism.

In the aftermath of the trade liberalization of the 1980s, a series of studies were conducted to document the trends, determinants, and prospects of agricultural trade both in Africa and elsewhere (Bouët et al. 2005; Bureau, Jean, and Matthews 2006; Bouët, Mishra, and Roy 2008; Croser and Anderson 2011; Moïsé et al. 2013). These studies highlighted a wide array of crucially important constraints to improving African agricultural trade. More importantly, they indicated the importance of global trade-policy actions and the need to address the different trade constraints holistically. According to these studies, agricultural trade determinants can be broadly classified under five major thematic areas: production capacity, the cost of trade, trade policies, domestic agricultural supports, and global market shocks. While production capacity and the cost of trade are usually referred to as supply-side constraints, many trade policies and agricultural support mechanisms in importing countries are considered to be demand-side constraints (with the exception of export taxes). Constraints related to global food, oil, and financial crises are taken as market-level trade constraints that influence imports and exports in different ways and to different extents from both the demand and the supply sides.

Supply-side determinants affect the competitiveness of a country in global or regional markets through their impact on costs of production and trading. These constraints include the nature and extent of resource endowments, productivity (including technology), the quality of the infrastructure and institutions that facilitate trade, and domestic agricultural support services provided to smallholder producers and traders in exporting countries. Demand-side constraints usually result from factors that (unsurprisingly) affect demand in importing countries, such as income growth, trade policies, and competitors' sales. Africa exports more than 75 percent of its agricultural production outside of the continent, and many of its trade partners impose several trade-protection measures that directly or indirectly limit agricultural exports. This is particularly the case for processed agricultural products and certain commodities, such as tobacco, cotton, coffee, cocoa, and oilseeds, in which Africa has the comparative advantage. In these as well as many other markets, African exporters compete with suppliers from other parts of the world. Therefore, close monitoring of the extent and nature of these constraints and their linkages with the flow of agricultural exports is required to guide effective, evidence-based trade policymaking in Africa.

The purpose of this chapter is to offer comprehensive and updated evidence on agricultural exports from Africa by examining the determinants of performance and competitiveness in order to isolate the key areas that should receive priority attention in policymaking at continental, regional, and national levels. Africa aspires to triple the current level of regional agricultural trade by 2025, which requires a wide range of interventions in the form of policies and investments. For these interventions to be effective and achieve their intended targets, key areas of intervention have to be identified, prioritized, and regularly monitored. This chapter presents a review of existing evidence, identifies key determinants of trade in general, and describes how these determinants are specifically important to African agricultural trade. Empirical evidence is provided to show the relative importance of trade constraints, how those constraints have

changed over time, and how they vary across countries.

The next section briefly reviews specific factors included in each of the five major determinants of trade, along with their conceptual and empirical links with trade. Thereafter, an empirical assessment estimating the relative importance of trade determinants is described, as are the data sources, the variables used, and the overall model results estimated for global-African and intra-African bilateral export trade.

The subsequent section describes, discusses, and tracks the major determinants of export flows; their magnitude, significance, and trends; and the conditions under which a factor becomes detrimental. The final section summarizes the major findings and draws conclusions of relevance for policy dialogue and action.

Review of Trade Determinants

Agricultural export performance is determined by many domestic and international factors from both the demand and the supply sides. Theoretical and empirical evidence suggests that these factors can be broadly classified into the five major categories indicated above: production capacity, the cost of trade, trade policies, domestic agricultural supports, and global market shocks. These constraints influence imports and exports in different ways and at different magnitudes.

Production Capacity

Production capacity refers to those factors that affect the level of supplies from a given country, including resource endowments and other technological and institutional factors that enhance a country's productivity and comparative advantages in global and regional markets. Both classical and neoclassical theories have exhaustively explained the importance of comparative advantage for improving performance of trade among countries. Nevertheless, the source of this production capacity and, hence, the source of comparative advantage has been strongly contended. While the Ricardian hypothesis advocates the importance of technological (or productivity) change as the major source of comparative advantage, the Heckscher-Ohlin hypothesis argues for the importance of relative factor endowments as a prime source of trade competitiveness. According to the Ricardian theory, the relative efficiency of producing goods and services determines the direction and magnitude of trade between two countries. In contrast, the Heckscher-Ohlin factor endowment theory predicts that countries with an abundance of one or more of the factors of production (land, labor, and capital) will specialize in commodities that require much of the abundant resources. However, empirical studies have confirmed that differences in productivity (technology) and factor endowment only explain a very small part of trade performance variations over time and across countries (Bergstrand 1990; Bernstein and Weinstein 2002). Moreover, recent evidence suggests factor endowment has greater relative importance over productivity or technology in explaining international trade performance (Amoroso, Chiquiar, and Ramos-Francia 2011).

The Cost of Trade

Factors exacerbating the costs of trade are highly diverse. The two most important factors are poor infrastructure and institutional inefficiency related to trade services—in addition to other costs, such as financial fees associated with export and import activities. The role of infrastructure in enhancing trade has been widely discussed in policy circles and in the literature (Bougheas, Demetriades, and Mamuneas 1999; Francois and Manchin 2007; Bouët, Mishra, and Roy 2008; Moïsé et al. 2013). Empirical studies have generally confirmed positive and significant effects of infrastructure quality on trade values in exporting countries.

However, therelative importance of infrastructural elements varies across studies. While road density has significant positive effects on trade volumes in low income countries, the effect of cellular phone density has been found to be less significant (Bouët, Mishra, and Roy 2008).

Institutional Efficiency

Institutional efficiency refers to the ease of doing business in relation to agricultural imports and exports. It includes procedures and delays in customs clearing, access to finance for traders, and the strength of contractual enforcement. Although customs and administrative procedures are essential for facilitating trade and implementing trade policies, they have the potential to restrict trade, particularly in countries where administrative systems are less automated, capacitated, and transparent.

These procedures and requirements delay delivery and cause extra costs related to storage fees and losses. Empirical studies have indicated that a 10 percent reduction in the time spent to clear exports, the number of signatures required to clear exports, or the number of documents needed to cross borders increases trade by 6 to 11 percent globally (Wilson 2007). Trade is more responsive to the number of documents than to the other metrics.

Trade Policies

Trade policies include measures aimed at protecting trade through tariffs and nontariff barriers. The effect of tariffs on trade performance has been studied using economywide simulations (for example, Bouët et al. 2005), gravity equations (for example, Bouët, Mishra, and Roy 2008), and trade restrictiveness indexes (for example, Croser and Anderson 2011). Although the magnitudes are different, all the studies indicate that the effect of import taxes on trade volumes is convincingly and significantly negative. Bilateral, regional, and international trade agreements either reduce tariffs or other regulatory requirements to facilitate crossborder trade. The most important of these agreements for African countries are trade preferences, particularly nonreciprocal ones, which aim to open up markets to developing countries, either individually or in groups. This involves complete or partial lifting of import tariffs and quotas for specified products. Preferences are usually designed to offer commercial opportunities for developing countries but are widely criticized for not being used due to rules of origin, their focus on commodities for which beneficiary countries have little competitive advantage, and the presence of associated stringent standards related to sanitary and phytosanitary requirements (Brenton 2003; Panagariya 2003; Topp 2003).

Despite these criticisms, recent studies have shown that preferences are still useful and beneficial, particularly for African countries (Wainio and Gehlhar 2004; Bouët, Fontagné, and Jean 2005; Bouët et al. 2012).

Nontariff measures include trade barriers that limit the quantity and volume of imports through a variety of technical and nontechnical standards. The United Nations Conference on Trade and Development classifies nontariff trade measures into 16 broad categories, each of which comprises several specific classifications.

The major ones are sanitary and phytosanitary requirements and technical barriers to trade, which include packing and labeling, standardization, price controls (anti-dumping), licensing, quantitative restrictions, export subsidies, and export taxes. Nontariff barriers constrain trade by increasing the cost of inspection, certification, and testing.

This is particularly important for developing countries, which have poor quality assurance infrastructure and technological capacity to conduct these processes and, hence, have to recruit third parties to access the services.

Domestic Agricultural Supports

Both developed and developing countries provide financial and technical support to their agricultural producers for different reasons. The support provided by industrial countries to protect their agricultural sectors has been considered to be the most damaging for trade from developing countries. Supports in these countries take the form of border measures (import tariffs, export subsidies) and domestic measures (production and input subsidies). Domestic supports can be implemented through markets or through direct payments. Both approaches have the potential to reduce the amount of imports from foreign countries. These supports raise the price received by the producers of the supported country above the world price so that they become artificially more competitive than imports from outside the country. Empirical studies assessing the link between domestic subsidies and trade have revealed mixed results depending on the type of commodity and support (coupled or decoupled). Many have argued that the removal of European Union (EU) and U.S. agricultural subsidies could have a significant effect on the world prices of some commodities, such as cotton, tobacco, and soybeans (Bouët et al. 2005; Bureau, Jean, and Matthews 2006). However, the impact of domestic subsidies is lower than other crossborder measures (Hoekman, Ng, and Olarreaga 2004; Anderson and Martin 2005).

Payments that are less related to the quantity produced (decoupled) have lesser impacts than payments directly related to production (coupled). As a result, many Organisation for Economic Co-operation and Development (OECD) countries are moving toward payments that are less tied to the quantity of domestic production (Urban, Jensen, and Brockmeier 2016). Developing countries do also provide technical, financial, and institutional support to smallholder producers to boost productivity and improve market efficiency, thereby enhancing agricultural exports. The extent of agricultural support provided to smallholder farmers depends on the size, allocation, and efficiency of public agricultural expenditures. These expenditures serve to accumulate capital stock that would enhance the production, as well as the trading capacity of smallholder producers (Benin, Mogues, and Fan 2012). However, the actual effect on trade depends on the focus and efficiency of public investments. Investments focused on export sectors would likely improve trade more than those investments focused on domestic food production or food security.

Global Market Shocks

Global food, financial, and oil markets are increasingly interconnected (Tadesse et al. 2014). Shocks to any of these markets would likely affect the nature and extent of agricultural trade. The 2007/2008 food price crisis, for example, caused many countries to impose export barriers and relax import restrictions on food products, which further aggravated the problem of price spikes and adversely affected agricultural trade (Yu et al. 2011; Anderson and Nelgen 2012; Bouët and Laborde 2012; Anderson 2014; Anderson and Thennakoon 2015). Similarly, the ongoing oil price crises may also affect the level of agricultural exports, particularly in those countries that are oil dependent. When the price of oil declines, oil-dependent countries may try to shift export dependence from oil to agricultural products, for which prices are relatively stable

Empirical Assessment

Data and Methods

Gravity-type econometric equations were used to examine the empirical and relative relevance of the determinants listed above in the African context. Models were used to estimate the logarithm of bilateral agricultural export values of African countries over a number of demand- and supply-side factors. Four of the major thematic determinants described above were included[10], as well as scale variables used to control for the size of importing and exporting economies and income differences between trading partners. Two to five specific variables were chosen as proxies for each of the major thematic determinants. Total gross domestic product (GDP) of both importing and exporting countries was used as a proxy for the size of partnering-country economies. Per capita GDP in importing countries was used to capture income effects, and per capita GDP in exporting countries was used as a proxy for capital endowment. Other assets, such as farm machinery, irrigation facilities, and so on, would have been a good indicator of capital for agriculture, but the data on these variables had a large number of missing values. The quantity of land and labor were included to measure resource endowments; road density, quality of port, index of trade infrastructural quality, index of customs clearing efficiency, and financial fees for exporting were used to measure costs of trade; frequency of nontariff measures, average *ad valorem* equivalent tariff rates, and regional trade agreements were considered as proxies of external trade policy; and the ratio of the agricultural producer price index to the manufacturing producer price index of importing countries and agricultural public expenditure of exporting countries were used to measure the effect of domestic agricultural policy in importing and exporting countries, respectively. The list of determinants considered in the analysis and the metrics used to estimate their magnitudes are described in Appendix Table 5A.1.

Data on income, resource endowments, infrastructure, and efficiency of institutions were drawn from World Bank (2016), trade data were obtained from UN Comtrade (2016), and data on tariffs were extracted from World Integrated Trade Solution (WITS 2016). Other sources were used for specific variables, such as nontariff barriers (WTO 2016), public agricultural expenditure (ReSAKSS 2016), producer price indexes (FAO 2016), and producer support estimates (OECD 2016). The quality of trade data in Africa has always been a big concern because sizable crossborder transactions are carried out informally and are unrecorded. The purpose of this chapter, however, is not to show the size of trade, but rather to examine the determinants of export flows. Thus, as long as the omitted trade transactions are random, they will have little impact on the results. All export values are for agricultural products unless and otherwise specified.

All the regressions were estimated using cross-sectional data from 2013, the most recent year for which adequate data were available for many of the determinants. One-year lagged values were used, however, for some variables (productivity and public agricultural expenditure) that were deemed to be endogenous to export values. Visualization of trade data over years indicates that no extraordinary events occurred in 2013 that could bias the results.

Two groups of models were estimated. The first group was used to estimate African agricultural exports to the global market. In this model, only African countries were included as exporters (i). In addition to African countries, countries from all continents that had frequent transactions with Africa were included in the analysis as importers (j). In general, a total of 49 exporters and 161 trade partners were considered[11]. A second group of models was used to estimate intra-African exports, with African countries as both exporters and importers.

[11] The countries of the Southern African Customs Union—Botswana, Lesotho, Namibia, South Africa, and Swaziland—were treated collectively as one country because many sources aggregate the trade data for these countries; in some instances, the average or sum of all or some of the countries was used, depending on the variable.

African exports to the rest of the world were also estimated for comparison purposes.

Of all possible pairwise transactions between the 49 exporting and 161 importing countries, about 58 percent had zero trade transactions. Excluding these transactions would likely cause selection bias, whereas including them would cause censoring bias. Although other studies excluded them and controlled for the selection bias using the Heckman approach, the current study included them and addressed the censoring bias using a Tobit model approach. Zero trade was assumed to be as a country's optimal outcome rather than a strategic choice not to trade with a specific partner.

Due to multiple data sources for different variables, the dataset was seriously affected by missing values. To overcome this problem, several specifications were considered through step-wise inclusion of explanatory variables that had different sets of observations and represented specific sets of determinants. A total of six specifications were estimated for African global exports. The first model estimated the effect of resource endowments together with scale variables.

In addition to the variables in this first model, the second model incorporated infrastructural and institutional variables, and the third model added public agricultural expenditure. All three models shared a common feature: they only considered domestic (supply-side) constraints. The fourth model included international (demand-side) variables, such as nontariff barriers, tariffs, and regional trade agreements. The fifth and sixth models were Tobit specifications with and without the agriculture-to-manufacturing price ratio variable that represented domestic agricultural supports by OECD countries. Since the price ratio was calculated for OECD countries only, the number of observations was greatly reduced in the final specification.

Empirical Results

Results of the six specifications for African global agricultural exports are shown in Table 5.1. The table's six columns present the results of the different specifications to help test robustness under different numbers of observations and to examine the predictive power of additional variables. In general, many determinants show the theoretically expected signs, with the exception of resource endowment, which seems to be a less important factor for African agricultural trade. Variables related to infrastructure and institutional efficiency are more significant than other domestic factors. These variables explain about 11 percent of the variation in agricultural export growth among African countries. Public agricultural expenditure appears to have a positive and generally significant effect on trade. Trade policy variables appear to be important determinants, next to the cost of trade, although significant variation exists among policy instruments. Nontariff barriers and regional trade agreements appear more important than tariffs. The effect of producer price ratios, which represent domestic agricultural support in importing countries, seems significant but requires further explanation.

The results of comparisons between determinants of intra-African trade and African exports to the rest of the world are shown in Table 5.2. Here, the comprehensive models (four and five) were used as agriculture-to-manufacturing price ratios were not available for most African countries. The results indicate that many of the determinants are equally important for African exports, whether within or outside Africa. The level of per capita income in importing countries is more relevant for intra-African trade than for African exports to the rest of the world, which can be explained by the lower level of incomes and higher elasticity of demand for agricultural products, and in particular for food, in Africa. Similarly, resource endowments and nontariff barriers are not as relevant for intra-African trade as they are for African trade with countries in other regions. This is consistent with the fact that resource endowments within Africa are closely similar, and nontariff barriers are not as stringent as they are outside Africa. Public agricultural expenditures are more relevant to reaching markets outside rather than within Africa.

Table 5.1. Response of African global agricultural export value to domestic and international factors

	Logarithm of value of exports from i countries to j countries					
	OLS			Tobit		
Determinants	(1)	(2)	(3)	(4)	(5)	(6)
Importer's GDP (billions of US$)	1.57***	1.65***	2.16***	2.23***	3.35***	2.70***
Exporter's GDP (billions of US$)	0.79***	0.88***	0.92***	1.19***	1.80***	1.48***
Per capita GDP of exporters (US$)	–1.14***	–1.17***	–2.11***	–2.30***	-3.63***	-2.67***
Per capita GDP of importers (US$)	–0.10***	–0.12***	–0.13***	0.03	–0.04	–0.21
Arable land (millions of hectares)	–0.52***	–0.69***	–0.52***	–0.47***	–0.52***	–0.91***
Agricultural labor (millions)	–0.02	0.25***	–0.38**	–0.43**	–0.77***	0.05
Road density (km per km2 of land)		0.01	–0.03	–0.02	0.03	0.37***
Quality of port		4.43***	4.26***	4.62***	6.94***	8.63***
Quality of transport infrastructure		1.80***	1.17**	1.15**	0.82	1.47
Efficiency of customs clearing index		1.24***	1.64***	1.69***	3.81***	0.03
Export cost (US$ per container)		–0.05	–0.07	–0.01	-0.27	–0.13
Public agricultural expenditure per agricultural GDP of exporter			0.12**	0.16**	0.46***	0.28*
Incidence of importer's nontariff barriers				–0.32***	–0.39***	–0.32***
Average tariff rate of importer				–0.06	–0.18*	–0.46***
Being in the same regional economic community				3.52***	5.39***	5.24***
The ratio of agricultural producer price index to manufacturing producer price index						–5.96***
Constant	5.44***	–2.43*	3.30*	1.66	0.9	–1.44
Sigma (test for censoring)					4.32***	3.21***
R-squared	0.30	0.41	0.41	0.49		
Number of observations	6,552	4,836	4,524	3,113	3,113	754

Source: Authors' estimations based on model results.

Notes: All the determinants except being in the same regional economic community are in logarithmic form, hence, the coefficients are elasticities; i countries refers to the 49 exporting African countries and j countries include importing countries all over the world. The lagged value of public agricultural expenditure was used to control for possible endogeneity. OLS = ordinary least squares; *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

Table 5.2. Determinants of intra-African agricultural exports

	Intra-African exports		African exports to the rest of the world	
Determinants	**OLS**	**Tobit**	**OLS**	**Tobit**
Importer's GDP (billions of US$)	1.91***	2.75***	2.31***	3.48***
Exporter's GDP (billions of US$)	0.32**	0.44*	1.22***	1.84***
Per capita GDP of exporters (US$)	–1.39**	–1.89*	–2.51***	–4.03***
Per capita GDP of importers (US$)	1.24***	2.24***	0.01	–0.06
Arable land (millions of hectares)	–0.21	–0.1	–0.53***	–0.62***
Agricultural labor (millions)	–0.43	–0.54	–0.43**	–0.81***
Road density (km per km² of land)	–0.22	–0.37	0.03	0.12
Quality of port	4.46***	6.83***	4.68***	7.05***
Quality of transport infrastructure	0.71	–0.45	1.26**	1.13
Efficiency of customs clearing index	2.39*	5.45**	1.51**	3.39***
Export cost (US$ per container)	–0.14	–0.63	0.02	–0.18
Public agricultural expenditure per agricultural GDP of exporter	0.2	0.62**	0.14**	0.41***
Incidence of importer's nontariff barriers	0.2	0.24	–0.35***	–0.39***
Average tariff rate of importer	0.53***	0.95***	–0.11	–0.32***
Being in the same regional economic community	3.55***	5.68***		
Constant	–9.64*	–20.95**	2.62	2.49
Sigma (test for censoring)		4.53***		4.13***
R-squared	0.435		0.519	
Number of observations	619	619	2,494	2,494

Source: Authors' estimations based on model results.

Notes: All the determinants except being in the same regional economic community are in logarithmic form, and hence the coefficients are elasticities; i countries refers to the 49 exporting African countries and j countries include importing countries all over the world. The lagged value of public agricultural expenditure was used to control for possible endogeneity. OLS = ordinary least squares; *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively.

Since the determinants for intra-African and global African exports are similar, the next section focuses on why some variables are more significant than others, and on tracking trends and distributions of key determinants using the results of the global-Africa agricultural export estimations. The importance of a determinant for intra-African trade is briefly discussed where relevant.

Describing and Tracking Key Determinants

The econometric results described above indicate which variables determine the level of agricultural exports by African countries. The following section details each of the determinants and their role in shaping export performance among these countries.

Resource Endowment and Productivity

As this study exclusively considers agricultural products, it is assumed that agriculture is both land and labor intensive in the African context, but less capital intensive compared with other sectors' products; capital is therefore expected to have a negative effect and land and labor a positive effect on agricultural exports. Nevertheless, all three resource endowment variables—labor, land, and capital (represented by exporters' per capita income)—show negative effects on agricultural exports (see Table 5.1). According to this result, countries with a higher per capita income are less likely to export agricultural products than countries with a lower per capita income. This is in line with the relative resource endowment theory, which predicts that a country specializes in an industry that requires less of the scarcest resource in the country. Hence, as countries grow (accumulate capital), their export portfolios shift from agriculture (less capital intensive) to sectors that are more capital intensive. Thus, capital endowment reduces exports of primary agricultural products.

The results also suggest that countries with scarce arable land and agricultural labor export more than do countries with abundant agricultural land and labor endowments. The negative effect of land on agricultural exports is due to the exclusion of land productivity from the models. When land and labor productivity are included in the model, the results become significantly different (Table 5.3).

If productivity is controlled for, land positively affects the performance of agricultural exports both to the world and within Africa, although the elasticity is greater for intra-African trade than for global trade. The impact of labor remains negative. Labor-abundant countries export less than labor-scarce countries, keeping productivity constant. This could be because African agriculture is not as labor intensive as expected. Alternatively, in an area where labor is abundant with low productivity, agricultural production may serve only for household subsistence without any significant contribution to exports.

Similarly, while countries with high land productivity perform better than do countries with low land productivity, countries with high labor productivity perform worse than do countries with low labor productivity. Labor productivity negatively affects trade performance, probably because wherever the productivity of labor is high, the local market becomes more attractive to producers than the export market. Increased agricultural labor productivity might be good for reducing poverty, but it seems to negatively affect agricultural export performance in Africa. The negative effect may indicate the extent of economic transformation. Countries with higher labor productivity are countries in which economic activity is shifting from agriculture to nonagricultural sectors, and hence where the composition of exports is shifting from agricultural to nonagricultural products.

Table 5.3. African agricultural export response to land and labor endowments and productivity (elasticity)

Endowment and productivity indicators	Global trade			Intra-African trade	
	(3)	(7)	(8)	(9)	(10)
Arable land (million hectares)	–0.52***	5.82***		7.15***	
Agricultural labor (millions)	–0.38**	–6.00***		–6.88***	
Land productivity (US$ per hectare)		6.24***	0.56***	7.21***	0.35***
Labor productivity (US$ per person)		–6.43***	–0.13	–7.40***	0.00
R-squared	0.41	0.49	0.51	0.44	0.44
Number of observations	4,524	3,113	3,435	3,101	3,397

Source: Authors' estimations based on model results.

Note: Global trade denotes bilateral trade between African countries and selected countries globally, including other African countries. Intra-African trade denotes trade among African countries only. Estimations include additional variables for which results are not presented.

These results imply that, while availability of arable land and increased land productivity can positively affect agricultural trade, having abundant labor alone does not necessarily lead to higher export trade; rather, it may retard Africa's global and intra-regional trade. Moreover, trade seems more elastic with respect to land productivity than to land availability, implying that investment in land productivity-enhancing technologies or institutions would help not only to increase farmers' incomes, but also to boost regional trade. Results indicate that a 1 percent increase in land productivity increases trade flows by about 6 percent to the global market and 7 percent to the African market. Land productivity has a stronger effect on intra-African trade than on global trade, which further explains the importance of improving land productivity to triple intra-African trade. This is because many African countries have similar resource endowments and closely similar trade facilities, so their competitiveness in regional trade mainly depends on the extent of agricultural productivity.

Infrastructural Quality and Institutional Efficiency

Variables addressing the quality of ports and transport, road density, efficiency of customs clearing, and financial export costs explain a significant part of the variation in agricultural export performance among African countries (Table 5.1). However, there appear to be significant differences among cost indicators in explaining trade flows. Road density and financial export costs do not have statistically significant effects on export performance. In contrast, the quality of port infrastructure and the efficiency of customs clearing consistently and positively affect trade performance. Since the cost of trade affects not only export performance, but also trade competitiveness (defined as the ratio of a country's exports to total African exports to the world or to the African market), further analysis was carried out to shed light on how cost indicators affect the competitiveness of a country in global and regional markets.

Results of the analysis of the effects of trade cost indicators on global and regional competitiveness show that, although road density and financial export costs have no effect on export volumes, they do have significant effects on competitiveness (Table 5.4). This is particularly significant when it comes to financial payments to clear exports. Financial export costs include all costs exporters pay for documents, administrative fees for customs clearance and technical control, customs brokers, terminal handling charges, and inland transport, and these costs are found to be crucial for trade

competitiveness. The lower these fees, the more likely a country becomes competitive both in regional and global markets. Unfortunately, financial fees for exports have been increasing over time in Africa south of the Sahara (SSA), particularly for landlocked countries (Figure 5.1). Sixteen African countries do not have their own ports and, hence, incur higher financial export costs per unit than do coastal countries. The cost gap between these groups of countries has widened over time. Lack of port access may induce preferential fees for port services and increased inland transport costs that raise export costs. Lack of port access also creates business insecurity.

Although the effect of road density on export performance was insignificant in most specifications (Table 5.1), it appears to have a significant and positive effect on competitiveness (Table 5.4). This could be because the African road networks are biased toward connecting local markets more than regional markets (Gwilliam et al. 2008).

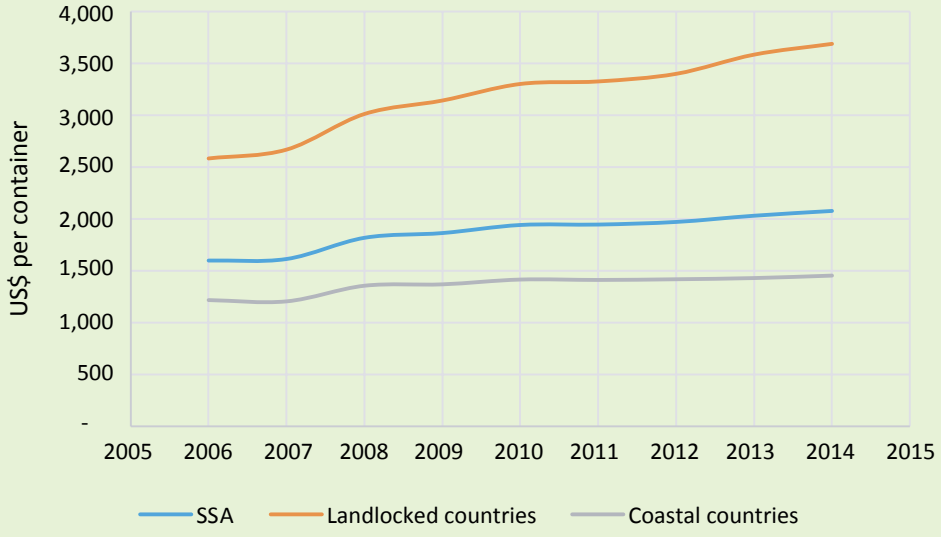
Table 5.4. The effect of trade costs on agricultural trade competitiveness in Africa

	Share of i country's supply of total African supply to:	
Cost indicators	**Global markets**	**African markets**
Road density (km per km2 of land)	0.002***	0.003***
Quality of port	0.105***	0.118***
Quality of transport infrastructure	–0.003	0.000
Efficiency of customs clearing index	–0.016***	–0.019**
Financial fees for exports (US$ per container)	–0.004***	–0.006***

Source: Authors' estimation based on international sources

Note: Estimations include additional variables for which results are not presented here.

Figure 5.1. Trends in the average costs of exports in Africa south of the Sahara, 2006–2014



Source: Authors' calculation based on World Bank (2016).

Note: Coastal countries have their own ports, whereas landlocked countries do not

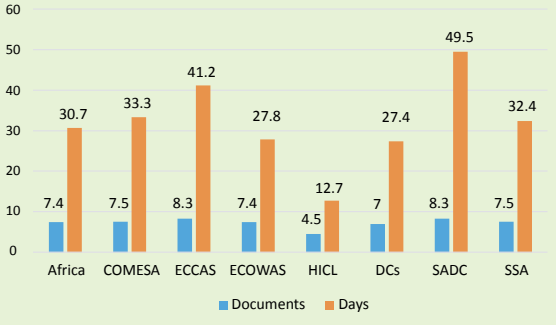
Even though domestic road networks have improved in many African countries in the past two decades, they are not well-connected to regional roads. As a result, they failed to support increased export volumes but did contribute to the countries' competitiveness. Unlike export volumes, which primarily depend on external efficiency, competitiveness mainly depends on internal efficiency. A country might be competitive compared with other producers, but its export volumes may not grow faster than others. This is exactly what the road density results demonstrate. Improved road density improves a country's internal competitiveness to supply cheaper products to external markets, so that the country's supply share is relatively higher than countries with lower road density. Yet, since the roads do not adequately connect local markets with regional or global markets, their effect on absolute export volumes remains insignificant. Despite the significance of road density, Africa remains poorly connected both internally and externally. According to the World Bank Rural Accessibility Index, only 34 percent of the rural population of SSA lives within 2 kilometers of an all-weather road (Carruthers, Krishnamani, and Murray 2010).

Port quality is important both for absolute export volumes (Table 5.1) and for trade competitiveness (Table 5.4). However, Africa has the lowest port quality of all regions of the world. Based on the quality of port infrastructure, the World Bank ranks ports from 1 (extremely underdeveloped) to 7 (efficient by international standards). According to this classification SSA scores 3.65, which is 13 percent below the world average and 29 percent below the average for high-income countries. This indicates an urgent need for African countries to invest in port infrastructure to improve both regional and global trade.

Other variables related to transport infrastructure and institutional efficiency are important for export performance but not for competitiveness (Table 5.4). The negative effect of institutional efficiency on competitiveness is puzzling. The institutional efficiency indicator was developed based on the number of documents, signatures, and days required to clear customs, both for imports and exports. The mix of these requirements may explain how the institutional efficiency index is related to trade competitiveness.

The mean number of documents and days required for clearing exports across different regions during 2006–2014 is shown in Figure 5.2. SSA had the highest level of requirements for both indicators compared with other regions. On average, it took more than 32 days to clear exports in SSA compared with less than 10 days for high-income countries and 27 days in all least developed countries. Significant differences were observed across regional economic communities (RECs), the worst being SADC member countries in which the average export during 2006–2014 took close to 50 days. The same is true for the number of documents required to clear exports; however, both indicators have declined over time (Figure 5.3). The number of documents fell from an average of nine in 2006 to seven in 2010 and remained constant thereafter. It seems that (as of 2014) countries had stalled in making progress to improve customs clearing processes. The number of days fell from 36 in 2006 to less than 30 in 2014, but the pace of the decline was very slow.

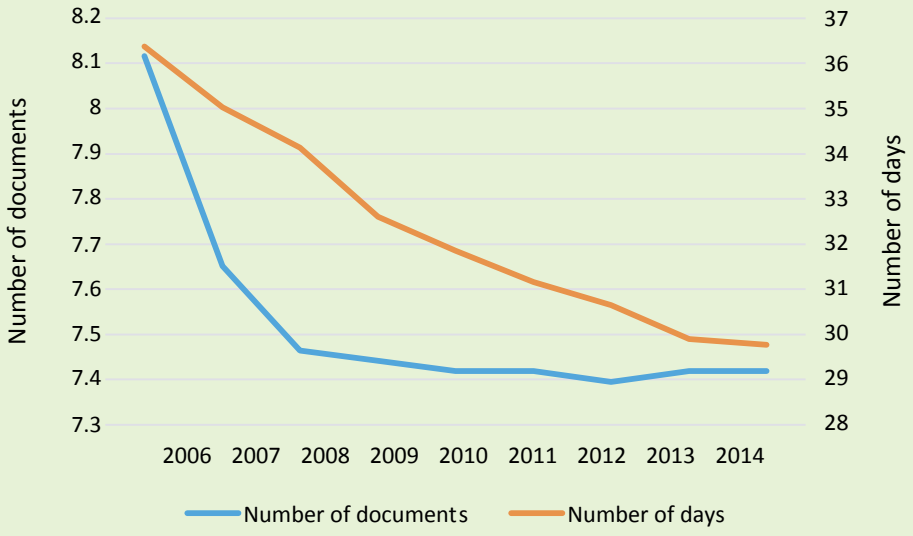
Figure 5.2. Number of days and documents needed to clear exports, 2006–2014 mean



Source: Authors' calculations based on World Bank (2016).

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = the Economic Community of West African States; HIC = high-income countries; LDCs = least developed countries; SADC = the Southern African Development Community; and SSA = Africa south of the Sahara.

Figure 5.3. Trends of export clearing efficiency in Africa south of the Sahara, 2006–2014



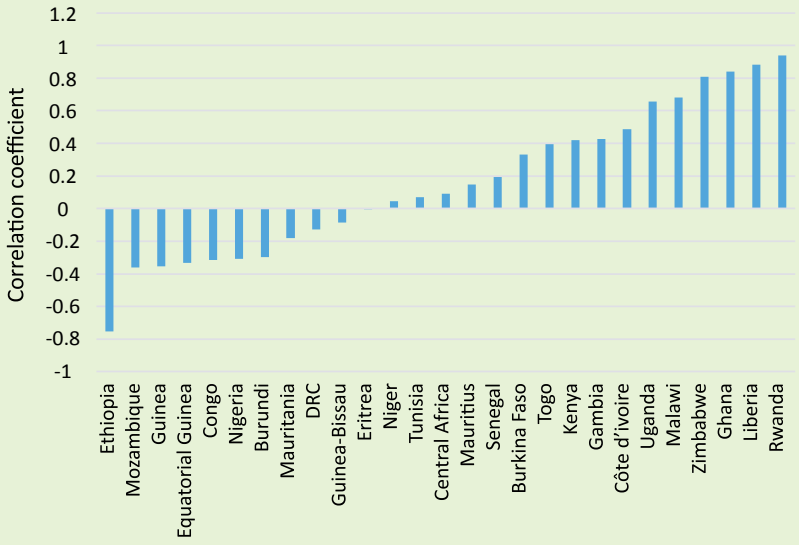
Source: Authors' calculations based on World Bank (2016).

Public Agricultural Expenditure

The effect of domestic agricultural support in exporting countries could be an important determinant of export growth in developing countries because farmers and traders in these countries are poor and less commercialized, and therefore less able to facilitate production and trade by themselves. The support provided in these countries is different from the support provided in high-income countries. In developing countries support is given to facilitate provision of agricultural extension, advisory, market access, and financial services. Public agricultural expenditure (PAE) is used as a proxy variable to measure the significance of government support in promoting agricultural exports in Africa. The empirical results reveal a positive and statistically significant association between PAE and export performance. On average, a 10 percent increase in PAE relative to agricultural GDP increases agricultural exports in the following year by about 2 to 4 percent.

The correlation between public agricultural spending and export performance significantly varies across countries (Figure 5.4). Unexpectedly, PAE has either no correlation or a negative correlation with exports in many countries. While Ethiopia stands out as having the largest negative correlation, Rwanda takes the lead as the most successful country from the positive perspective. Many factors could explain why countries experience a negative correlation. First, they might have focused more on domestic food security, so public expenditure has little or no relevance in promoting external trade. This is the case in Ethiopia, where a significant part of the public budget is allocated to large food security projects, such as the Productive Safety Net Program, and extension personnel who primarily provide services for food crop production. The country's competitive commodities, such as coffee, oilseeds, and hides and skins, have received very little financial support relative to their importance as exports. Second, these countries' investments in export commodities might be less efficient in facilitating trade and production. Third, a decline in the terms of trade could explain part of the paradox, but empirically this should have little contribution to the negative correlation. In contrast, many countries utilized the public budget as a policy tool to create incentives for agricultural exports (Figure 5.4). Rwanda is followed by Liberia, Ghana, and Zimbabwe, in which expenditures and exports are strongly correlated, with coefficients above 0.8.

Figure 5.4. Correlation between public agricultural expenditure and agricultural exports, 2005–2013



Source: Authors' estimations based on UN Comtrade (2016) for export data and ReSAKSS (2016) for public expenditure data.

Note: Correlations are calculated between current export values and the previous year's public agricultural expenditure

Regional Trade Agreements

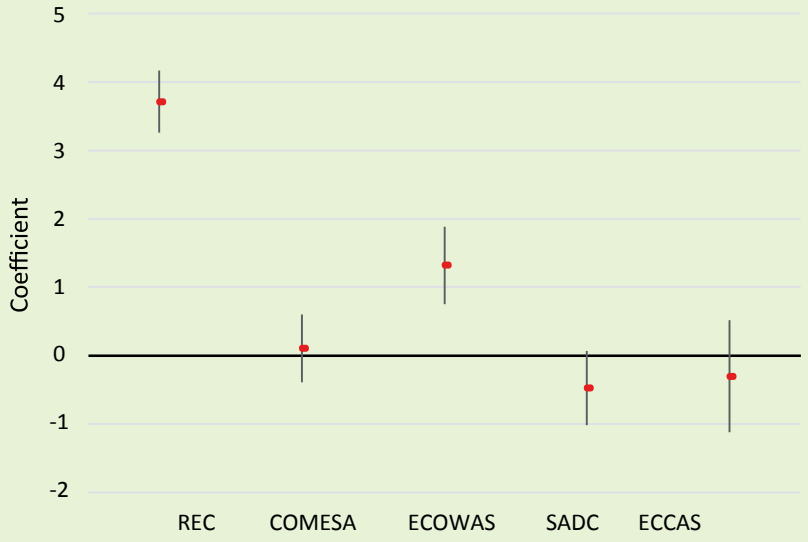
Regional trade agreements remove or reduce tariffs and facilitate joint trade for REC members. These agreements create trade within the trade agreement zone and divert imports from the rest of the world. Empirical results have shown that the trade creation effects of African RECs, such as the Common Market for Eastern and Southern Africa (COMESA), the Economic Community of West African States (ECOWAS), the Southern African Development Community (SADC), and the Economic Community of Central African States (ECCAS), are stronger than their trade diversion effects (Figure 5.5). The overall trade creation effect—as captured by the REC variable (taking the value of 1 if the importing and exporting countries are from the same REC and otherwise zero)—has a positive and statistically and economically significant effect on export performance. Being a member of any of the RECs increases a country's export value by 3 to 5 percent. This effect captures not only the effect of free trade agreements, but also the effect of trade facilitations commonly targeted for crossborder trade. Countries within the same REC are geographically closer to each other, so this variable may also capture proximity effects. In any case, the trade creation effects of African RECs are convincingly large and significant.

The trade diversion effects of these RECs are not yet significant and uniform. The effects were captured by including dummy variables for each REC (taking the value of 1 if the importing country is a member of a given REC and the exporting country is not, and zero otherwise). This variable measures openness of member countries to nonmember countries. The variable representing ECOWAS has a significant and positive effect on exports, implying that being an ECOWAS member makes countries open to nonmembers, signifying a positive trade diversion effect (Figure 5.5). SADC has a protective effect, but it is only significant at the 10 percent (90 percent confidence) interval. COMESA and ECCAS show positive and negative trade diversion effects, respectively, but the coefficients are not statistically significant. These results are consistent with previous evidence (Makochekanwa 2012). Since welfare depends on the extent of both trade diversion and trade creation, policymakers should target increasing the diversion, as well as the creation effects. Internal institutions and efficiency may explain the differential effects of RECs on trade diversion.

Tariffs and Preferences

Despite declining trends in tariff rates imposed on agricultural products worldwide, tariffs are still important determinants of trade. The modeling results of this study estimate that a 10 percent increase in tariff rates reduces African agricultural exports by about 3 percent (Table 5.1), which is closely similar to previous studies (Bouët, Mishra, and Roy 2008; Moïsé et al. 2013). Luckily, Africa, particularly SSA, is increasingly receiving tariff preferences from importing countries.

Figure 5.5. The effects of trade creation and diversion in Africa's regional economic communities, 2013



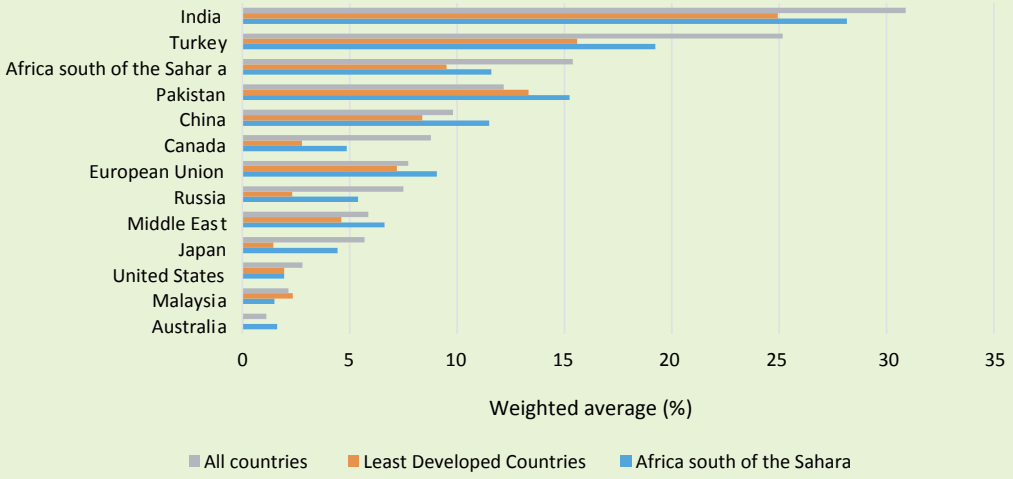
Source: Constructed by authors.

Note: The value range for REC (Regional Economic Community) indicates the combined trade creation effect for all communities. RECs is a dummy variable that takes the value 1 if both importing and exporting countries are from the same REC and zero otherwise. Effects denoted by each of the REC indicate the trade diversion effects. For example, the value under "COMESA" indicates the effect of a variable that takes 1 if the importing country is a COMESA member and the exporting country is not, and zero otherwise. It therefore measures the trade diversion effect of COMESA, and the same holds for the other RECs. The figure shows coefficients and 95 percent confidence intervals. If zero is included within the confidence interval, the coefficient is interpreted as statistically insignificant.

The average tariff rates imposed by selected countries on agricultural products imported worldwide, from least developed countries, and from within SSA are presented in Figure 5.6. Although India and Pakistan impose the largest tariff rates on global agricultural imports, they impose lower rates for imports from SSA. Other countries, such as Canada, Russia, and the United States, also impose lower average duties on imports from SSA. As expected, the countries of SSA impose lower taxes on imports from within the region than from outside it. In some countries and regions, including China, the EU, and the Middle East, agricultural products from SSA are being taxed more than the world average. This could be because selected products are given preference, especially by the EU. If exports from SSA are not among the preferential products, they would be subject to higher tariff rates than those imposed on preferential products from other areas.

In many countries, African products are taxed at higher rates than the average for other developing economies or least developed countries. This indicates that, although several preferences are enacted in the EU and the United States, African products are still highly taxed compared with other developing countries. Most importantly, on average, SSA countries impose a higher rate of import tax on other SSA countries than they do on all least developed countries. This implies that some African countries provide a lower tax rate for non-African countries than they do for African countries.

Figure 5.6. Tariff rates imposed on agricultural imports by major African trade partners, 2005–2015

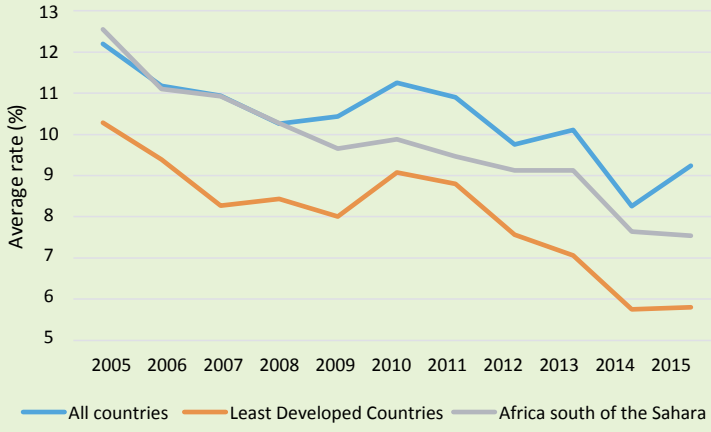


Source: Authors' estimation based on WITS (2016).

Notes: Tariff rates are weighted averages based on the amount of imports. Each country or group of countries levies different rates for different countries for the same products. The rates are averaged for all countries, for least developed countries, and for Africa south of the Sahara.

An encouraging trend is that tariff rates applied on imports of agricultural products from any part of the world have declined sharply over time (Figure 5.7). Average tariff rates fell from more than 12 percent in 2005 to close to 8 percent in 2014—a 3 percent yearly rate of decline. Multilateral negotiations through the World Trade Organization and the increasing global food demand as demonstrated by the food price crisis in 2007/2008 might have contributed to this effect. The decline is proportionally similar among the rates applicable to the world as a whole, to SSA, and to least developed countries. Globally, African products have been taxed at lower rates than the world average since 2009, and the gap between these tax rates has widened since then. On the other hand, African exporters have consistently faced higher taxes than other developing countries.

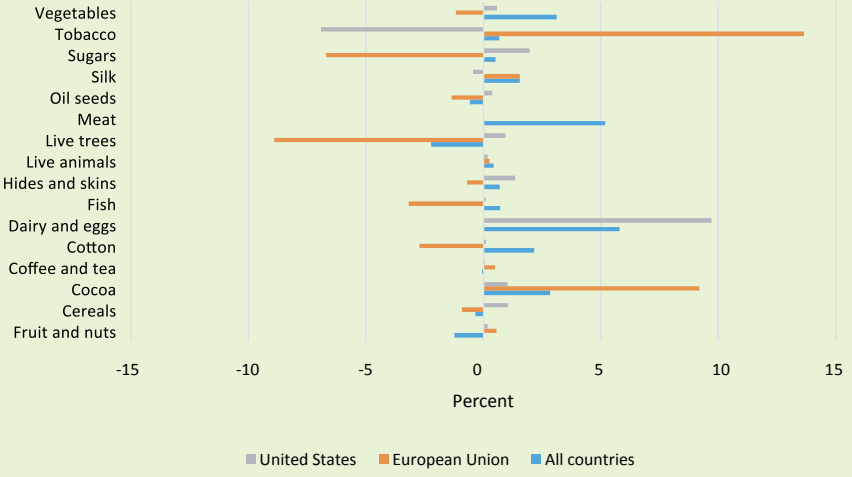
Figure 5.7. Trends of tariff rates imposed on Africa south of the Sahara, least developed countries, and world exports, 2005–2015



Source: Authors' estimation based on WITS (2016).

Despite clear evidence that, on average, greater preferences are given to African exports than to those of other regions, there is broad debate about the benefits of such preferences in enhancing African trade[12]. One of the criticisms is that preferences are given to commodities or products for which Africa has no comparative advantage. Although this criticism applies to comparisons of manufactured and agricultural products, it can also be applicable to agricultural products. Significant variations exist in the preference rates given to SSA by the world, the United States, and the EU across different agricultural products (Figure 5.8). The United States provides preferences for a wider range of products than do the EU and others; however, the United States does not provide preferences for silk or tobacco. In contrast, the EU provides the highest preference for tobacco. The United States provides the highest preference for dairy products, followed by sugar, and then hides and skins. Although some African countries could have a comparative advantage in sugar and in hides and skins, many countries may not have a global comparative advantage in dairy products (Badiane, Odijo, and Jemaneh 2014). While preference rates for cocoa are reasonably significant, preference rates for coffee and tea are minimal, confirming that preferences are given irrespective of a country's comparative advantage.

Figure 5.8. Rates of preference given to exports of major products from Africa south of the Sahara, 2013



Source: Authors' estimations based on WITS (2016).

Note: Values indicate rates of preferences and are calculated as the average tariff rates imposed by all countries, by the EU, and by the United States on world imports, minus tariff rates imposed on SSA imports.

Nontariff Barriers

Much empirical evidence, including the findings of this chapter, indicates that trade is more responsive to nontariff barriers than it is to tariffs (Table 5.1). This shows the increasing importance of nontariff barriers following the declining trends of tariffs due to bilateral and multilateral trade agreements and preferences. Yet, despite the growing understanding of the significance of nontariff barriers to trade, certain issues are still unclear, including (1) which type of nontariff barriers cause significant impacts on trade, (2) which type of nontariff barriers are prevalent in agricultural trade, (3) how these measures are evolving, and (4) what strategic options African countries have to reduce the effect of nontariff barriers on trade performance.

The prevalence of different nontariff barriers across major African trade partners, which import about 90 percent of African agricultural

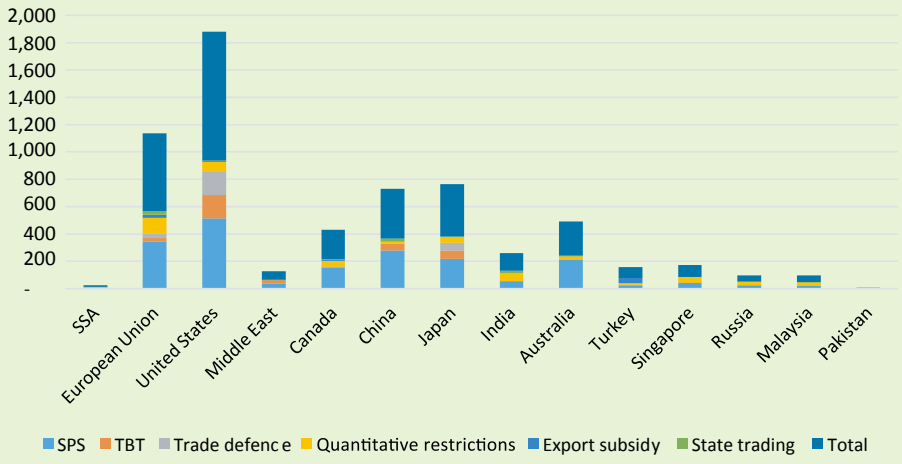
[12] Preference rates are defined as the difference between the average tariff rates on imports from the world and imports from SSA.

exports, is shown in Figure 5.9. Of all the countries, the United States takes the lead in terms of the number of measures imposed on the import of agricultural products. During the 2012–2015 period, the United States imposed about 1,000 measures per year, which were counted across products and types of nontariff barriers (WHO, 2016). Close to 50 percent of these relate to sanitary and phytosanitary measures, which—followed by technical barriers to trade—are the dominant type of nontariff barriers in many countries. Quantitative restrictions are widely prevalent in the EU. Unlike many other measures, sanitary and phytosanitary requirements are politically and environmentally acceptable because they relate to health, safety, and hygiene. Unfortunately, these requirements have a greater impact on trade than do any other measures (Figure 5.10). A 10 percent increase in the number of products affected by sanitary and phytosanitary measures reduces trade by about 3 percent. This result is consistent with a previous study indicating that sanitary and phytosanitary measures penalize poor countries more strongly than other countries (Disdier, Fontagne, and Mimouni 2008).

Export subsidies, which are prevalent in the EU, Turkey, and the United States, have the next-largest negative effect on African agricultural trade. In contrast, the involvement of state enterprises in imports and exports positively affects African exports, probably due to the discretionary preference that these enterprises may provide to African imports. The involvement of state enterprises in agricultural trade is most prevalent in China and India, and in some EU member states. In general, the number of nontariff barriers has been steadily increasing over time in both the United States and the EU, which impose the largest number of trade-reducing nontariff barriers of all of Africa's trading partners (Figure 5.11).

The significant impact of nontariff barriers on trade, and their growth over time, present significant challenges to policymakers as to how to minimize the adverse effects of these measures. Given public concerns, reducing the prevalence of nontariff barriers through international negotiation is unlikely. Rather, African policymakers should focus on reducing the vulnerability of their trade to these measures, the majority of which demand certification and labeling and, hence, involve increased costs. Efficient institutional and infrastructural arrangements are required to reduce these costs. Establishing a certification and accreditation center for an individual country could be costly and, in some cases, impossible. Therefore, regional cooperation should be an important area of policy focus. Furthermore, areas exist where individual countries could facilitate exports by establishing facilitation centers to assist exporters in fulfilling the requirements imposed by importers.

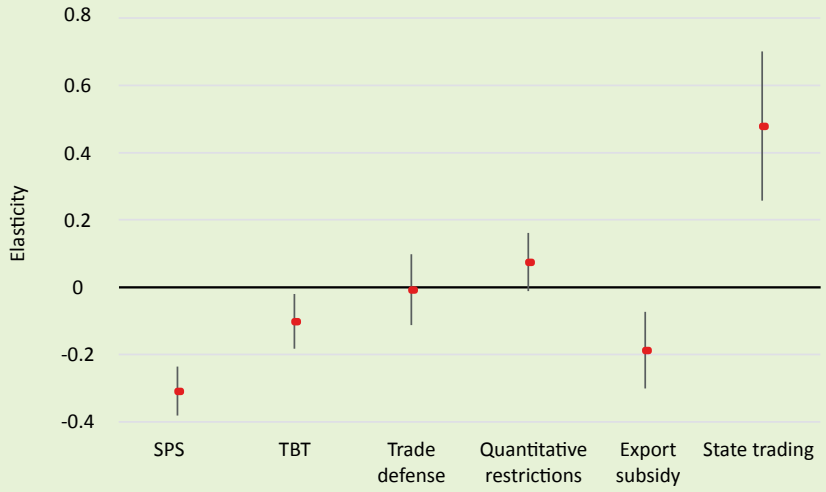
Figure 5.9. Frequency of nontariff measures on agricultural products, 2012–2015 mean



Source: Authors' estimations based on WTO (2016).

Notes: SPS = sanitary and phytosanitary measures; and TBT = technical barriers to trade based on United Nations Conference on Trade and Development classifications. The frequency of nontariff barriers is measured as the sum of all types of measures for all HS6 classified products. For example, if two measures are imposed on one product, three measures on three products, and zero on all other products, the frequency will be 2*1+3*3=11.

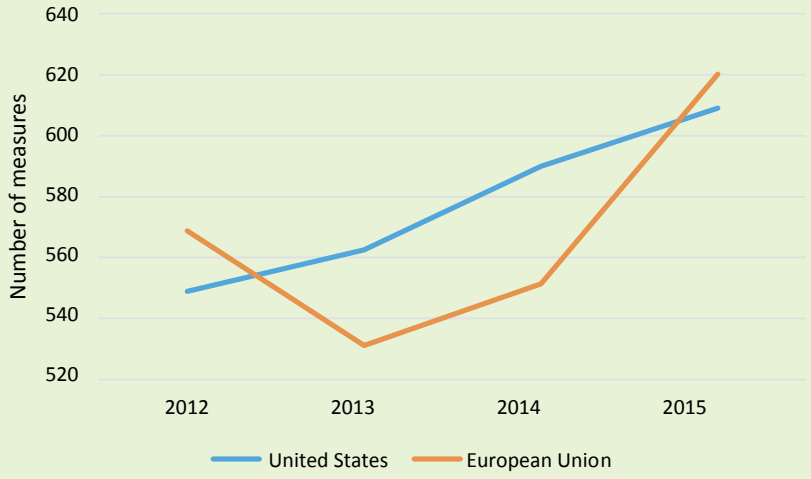
Figure 5.10. Effects of nontariff measures on export growth in Africa, 2013



Source: Authors' estimations based on WTO (2016).

Note: SPS = sanitary and phytosanitary measures; and TBT = technical barriers to trade based on the United Nations Conference on Trade and Development classifications. The figure shows coefficients and confidence intervals. Where zero is included within the confidence interval, the coefficient is interpreted as statistically insignificant.

Figure 5.11. Trends of nontariff measures in the United States and European Union, 2012–2015



Source: Authors' calculation based on WTO (2016).

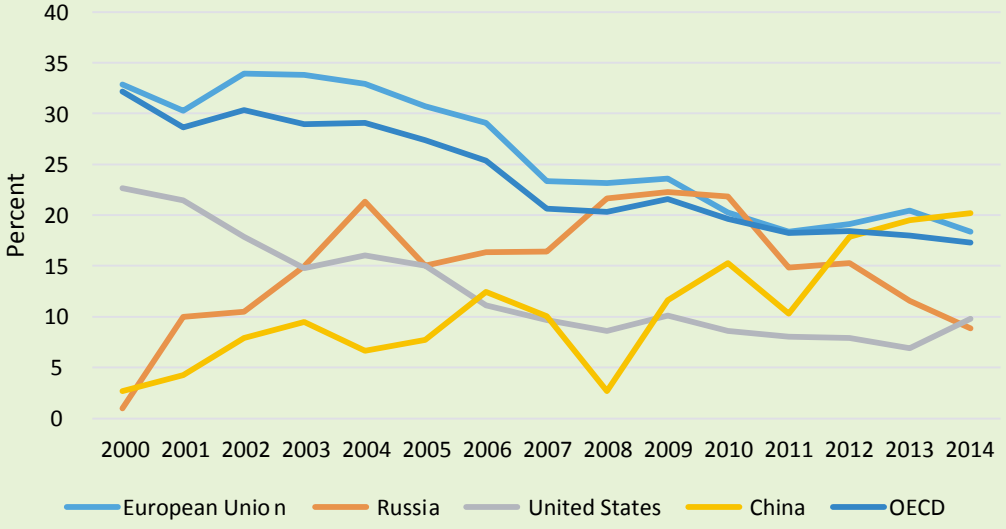
Domestic Agricultural Supports in OECD Countries

The empirical link between domestic agricultural supports in OECD countries and the value of agricultural exports in African countries was assessed using the ratio of agricultural and nonagricultural producer prices. This price ratio may capture the effect of all border and domestic supports, including tariffs, export subsidies, and production and input subsidies. Since tariffs and nontariff barriers are included as explanatory variables, the price ratio should predict the effect of domestic supports. The effect of this price ratio is negative and statistically significant (Table 5.1). According to this estimation, a 1 percent increase in the price ratio reduces African exports by about 5 percent. However, the implication of this elasticity

depends on the actual correlation of the price ratio with domestic support. Many economists argue that, since most payments to agricultural producers are made through direct payments, the impact of agricultural subsidies on trade is limited (Hoekman, Ng, and Olarreaga 2004; Anderson and Martin 2005; Croser and Anderson 2011). But when comparing producer prices of agricultural and manufacturing products, in many cases the resulting ratio is greater than one, implying that agriculture is treated preferentially and that this treatment restricts imports from developing countries. Generally, this leads to the conclusion that, although the effect of domestic support might not be as large as crossborder measures (such as tariffs and nontariff barriers), it still plays a significant role.

It appears, however, that the rate of agricultural support has generally declined over time in many OECD countries (Figure 5.12). Of all the countries considered, EU countries provided the highest support throughout the two decades to 2015. Emerging economies, such as China and Russia, are also increasingly supporting their producers despite the instability and unpredictability of that support, which is said to mainly take the form of tariffs and nontariff barriers rather than subsidies.

Figure 5.12. Trends of producer support estimates in OECD countries, 2000–2015



Source: Authors' estimations based on OECD (2016).

Note: OECD = Organisation for Economic Co-operation and Development.

Both the empirical analysis presented in this chapter and recent public support estimates trends suggest the importance of domestic support in high-income countries for the performance of African exports. Nevertheless, African countries, in particular, and developing countries, in general, have few policy options to curb the adverse effects of this domestic policy action in foreign countries. Although multilateral trade negotiations through the World Trade Organization are usually of limited effectiveness, they remain the most likely avenue for developing countries to compel high-income countries to reduce or redesign their agricultural supports. Economic growth in many African and Asian countries, and the increasing threat of climate change, may create leverage for developing countries to organize themselves and enforce effective global policy actions through the World Trade Organization.

Conclusion

African countries continue to strive to expand market opportunities for domestic producers both regionally and globally; however, this effort is being impeded by emerging and evolving constraints. Although many of the constraints seem conventional and traditional, the nature and extent of these constraints are evolving dramatically following global and regional shocks and opportunities. The examination of the key determinants of trade presented in this chapter generally found the existing evidence to be insufficiently comprehensive, lacking in the needed focus on Africa, and in need of updating. Realistic and updated assessments are required to feed the increasing policy momentum to improve African agriculture. The analysis did confirm that agricultural trade determinants are both diverse and complex, ranging from farm-level, supply-side constraints to global-level, demand-side barriers. Consequently, they call for regular monitoring and prioritization to facilitate immediate policy and development actions.

The empirical analysis, which aimed to identify and track key determinants of trade, indicated that supply-side constraints, including production capacity and the costs of trade, are more important determinants than are demand-side global constraints. This offers African policymakers the opportunity to focus on domestic production and trade facilitation, which can easily be influenced through national and regional policies and investments. A lot can be achieved simply by focusing on domestic factors instead of assuming that international factors are the culprits for low and, in some countries, declining agricultural exports.

This does not, however, rule out the importance of cooperation, both regionally and globally.

Regional cooperation is key to enhancing trade by reducing trade barriers and increasing productivity. The empirical analysis clearly confirmed that Africa's RECs had significantly contributed to agricultural export growth. These regional entities can be further utilized to reduce regional as well as global trade barriers. One important function of regional bodies could be joint trade facilitation initiatives that help fulfill the growing nontariff trade requirements facing African trade partners.

Despite a growing tendency toward import tariff reductions, partly due to preferential trade, nontariff barriers are significantly increasing and affecting African exports more than tariffs. This trend demands not only regional cooperation, but also global cooperation. Ensuring global cooperation has always been a challenge for developing countries, but growing opportunities exist that can enhance the bargaining power of developing countries in general, and African countries in particular. These include the growing importance of the continent as a consumer market and investment destination, given rising incomes and populations. In addition, Africa can play a pivotal role in mitigating the global climate threat. Nevertheless, global cooperation should not be viewed solely as an instrument for influencing international trade policies; rather, Africa should also seek this cooperation to facilitate trade and enhance domestic agricultural value addition.

References

Amoroso, N., D. Chiquiar, and M. Ramos-Francia. 2011. "Technology and Endowments as Determinants of Comparative Advantage: Evidence from Mexico." *North American Journal of Economics and Finance 22* (2): 164–196.

Anderson, K. 2014. "The Intersection of Trade Policy, Price Volatility, and Food Security." *Annual Review of Resource Economics* 6 (1): 513–532.

Anderson, K., and W. Martin. 2005. "Agricultural Trade Reform and the Doha Development Agenda." *World Economy* 28 (9): 1301–1327.

Anderson, K., and S. Nelgen. 2012. "Agricultural Trade Distortions during the Global Financial Crisis." *Oxford Review of Economic Policy* 28 (2): 235–260.

Anderson, K., and J. Thennakoon. 2015. "Food Price Spikes and Poor, Small Economies: What Role for Trade Policies?" *African Journal of Agricultural and Resource Economics* 10 (1): 16–31.

Badiane, O., S. Odjo, and S. Jemaneh. 2014. "More Resilient Domestic Food Markets through Regional Trade." In *Promoting Agricultural Trade to Enhance Resilience in Africa*, edited by O. Badiane, T. Makombe, and G. Bahiigwa. ReSAKSS Annual Trends and Outlook Report 2013. Washington, DC: International Food Policy Research Institute.

Benin, S., T. Mogues, and S. Fan. 2012. "Agricultural Growth and Poverty Reduction Impacts of Public Investments: Assessment Concepts and Techniques." In *Public Expenditures for Agricultural and Rural Development in Africa*, edited by T. Mogues and S. Benin. London: Routledge.

Bergstrand, J. 1990. "The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intra-Industry Trade." *Economic Journal* 100 (403): 1216–1229.

Bernstein, J., and D. Weinstein. 2002. "Do Endowments Predict the Location of Production? Evidence from National and International Data." *Journal of International Economics* 56: 55–76.

Bouët, A., J.-C. Bureau, Y. Decreux, and S. Jean. 2005. "Multilateral Agricultural Trade Liberalisation: The Contrasting Fortunes of Developing Countries in the Doha Round." *World Economy* 28 (9): 1329–1354.

Bouët, A., L. Fontagné, and S. Jean. 2005. *Is Erosion of Tariff Preferences a Serious Concern?* CEPII Working Paper 2005-14. Paris: Centre d'Etudes Prospectives et d'Informations Internationales.

Bouët, A., and D. Laborde. 2012. "Food Crisis and Export Taxation: The Cost of Non-Cooperative Trade Policies." *Review of World Economics* 148 (1): 209–233.

Bouët, A., D. Laborde, E. Dienesch, and K. Elliott. 2012. "The Costs and Benefits of Duty-Free, Quota-Free Market Access for Poor Countries: Who and What Matters." *Journal of Globalization and Development* 3 (1): 1–27.

Bouët, A., S. Mishra, and D. Roy. 2008. *Does Africa Trade Less than It Should, and If So, Why? The Role of Market Access and Domestic Factors*. IFPRI Discussion Paper 770. Washington, DC: International Food Policy Research Institute.

Bougheas, S., P. Demetriades, and T. Mamuneas. 1999. "Infrastrucutre, Transport Costs and Trade." *Journal of International Economics* 47 (1): 169–189.

Brenton, P. 2003. *Integrating the Least Developed Countries into the World Trade System: The Current Impact of EU Preferences under Everything But Arms*. World Bank Policy Research Working Paper 3018. Washington, DC: World Bank.

Bureau, J.-C., S. Jean, and A. Matthews. 2006. "The Consequences of Agricultural Trade Liberalization for Developing Countries." Invited paper presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12–18.

Carruthers, R., R. Krishnamani, and S. Murray. 2010. *Africa Infrastructure Country Diagnostic: Improving Connectivity: Investing in Transport Infrastructure in Sub-Saharan Africa*. Washington, DC: World Bank.

Croser, J. and K. Anderson. 2011. Agricultural Distortions in Sub-Saharan Africa: Trade and Welfare Indicators, 1961 to 2004. *World Bank Economic Review* 25 (2): 250–277.

Disdier, A.-C., L. Fontagne, and M. Mimouni. 2008. "The Impact of Regulations on Agricultural Trade: Evidence from SPS and TBT Agreements." *American Journal of Agricultural Economics* 90 (2): 336–350.

FAO (Food and Agriculture Organization of the United Nations). 2016. FAOSTAT database. Accessed March 2016. http://www.fao.org/faostat/en/.

Francois, J., and M. Manchin. 2007. *Institutions, Infrastructure and Trade*. CEPR Discussion Paper 6068. London: Centre for Economic Policy Research.

Gwilliam, K., V. Foster, R. Archondo-Callao, C. Briceño-Garmendia, A. Nogales, and K. Sethi. 2008. *Africa Infrastructure Country Diagnostic: Roads in Sub-Saharan Africa*. Washington, DC: World Bank.

Hoekman, B., F. Ng, M. Olarreaga. 2004. Agricultural Tariffs or Subsidies: Which Are More Important for Developing Economies? *World Bank Economic Review* 18 (2): 175–204.

Makochekanwa, A. 2012. *Impacts of Regional Trade Agreements on Trade on Agrifood Products: Evidence from Eastern and Southern Africa*. Paper presented at the African Economic Conference 2012, Kigali, Rwanda, October 30–November 2.

Moïsé, E., C. Delpeuch, S. Sorescu, N. Bottini, and A. Foch. 2013. *Estimating the Constraints to Agricultural Trade of Developing Countries*. OECD Trade Policy Paper 142. Paris: OECD Publishing.

NationMaster. 2016. Road density data. Accessed March, 2016 www.nationmaster.com/country-info/stats/Transport/Road-density/Km-of-road-per-100-sq.-km-of-land-area.

OECD (Organisation for Economic Co-operation and Development). 2016. Producer support data. Accessed March 2016. https://data.oecd.org/.

Panagariya, A. 2003. "Aid through Trade: An Effective Option?"

RESAKSS (Regional Strategic Analysis and Knowledge Support Systems). 2016. Public agricultural expenditure data. Accessed March 2016. www.resakss.org.

Tadesse, G., B. Algieri, M. Kalkuhl, and J. von Braun. 2014. Drivers and Triggers of International Food Price Spikes and Volatility. *Food Policy* 47: 117–128.

Topp, A. 2003. *Are Trade Preferences Useful in Advancing Economic Development?* Australian National University Working Paper 503. Canberra.

UN Com trade. 2016. UN Comtrade Database. Accessed March 2016. https://comtrade.un.org/.

Urban, K., H. Jensen, and M. Brockmeier. 2016. "How Decoupled is the Single Farm Payment and Does It Matter for International Trade?" *Food Policy* 59: 126–138.

Wainio, J., and M. Gehlhar. 2004. *MFN Tariff Cuts and U.S. Agrciutral Imports Under Nonresprocal Trade Preference Programs*. Paper presented at the 7th Annual Conference on Global Economic Analysis, Washington, DC, June 17–19.

Wilson, N. 2007. *Examining the Trade Effect of Certain Customs and Administrative Procedures*. OECD Trade Policy Paper 42. Paris: OECD Publishing.

WITS (World Integrated Trade Solution). 2016. Data on tariffs. Accessed March 2016. http://wits.worldbank.org/.

World Bank. 2016. World Development Indicators. Accessed March 2016. http://data.worldbank.org/data-catalog/world-development-indicators.

World Trade Organization. 2016. Data on nontariff barriers. Accessed March 2016. http://i-tip.wto.org.

Yu, T., S. Tokgoz, E.Wailes, and E. Chavez. 2011. "A Quantitative Analysis of Trade Policy Responses to Higher World Agricultural Commodity Prices." *Food Policy 36*: 545–561.

Appendix 5A. Supplementary Tables

Table 5A.1. List of determinants and indicators used to estimate African agricultural export performance

Determinants	Indicators and definitions
Size and income level	Total GDP and per capita GDP were used to control for the size of both importing and exporting economies. GDP was measured as real values deflated by 2005 constant prices in billions of U.S. dollars. Per capita GDP was measured in U.S. dollars per person. In both cases, the 2013 values were used. Missing values were replaced by values of the previous year.
Resource endowment and productivity	Land and labor for exporting countries were chosen to test the role of resource endowments for trade. Land was measured as the total arable land in millions of hectares and labor was measured as total agricultural labor in millions of persons. The productivity of these resources was also included at a later stage of the analysis to test the relevance of endowment vs. technology. Land productivity was measured as agricultural value-added per hectare of land; similarly, labor productivity was estimated as the ratio of agricultural GDP to agricultural labor force. All data were from ReSAKSS (2016).
Infrastructural quality	Road density, port quality, and quality of trade transport infrastructure were used to measure the effect of infrastructure on trade performance. Data on road density were obtained from NationMaster (2016), with road density measured in terms of kilometer of road per square kilometer. Indexes of port and trade transport qualities were obtained from the World Bank "Doing Business" survey. The indexes were represented by scalar cores ranging from 1 to 7 (1 being extremely poor/inaccessible and 7 being very efficient/accessible). Since the survey data cover different years for different countries, the averages of available data for the 2010–2013 period were used.
Institutional efficiency	The World Bank Logistics Performance Index, specific to the efficiency of customs clearance processes, was used as a proxy for institutional efficiency related to trade. The index aggregates the respondents' rankings of the efficiency of customs clearance processes (that is, speed, simplicity, and predictability of formalities), on a rating ranging from 1 (very low) to 5 (very high). Scores were averaged across all respondents.
Financial cost of exports	Infrastructural quality and institutional efficiency, which were used as a proxy for costs of trade, do not capture all costs involved in the export of import of commodities. The cost of exports estimated by the World Bank was used to control for unaccounted trade costs. The indicator measures the fees levied on a 20-foot container in U.S. dollars. All the fees associated with completing the procedures to export or import the goods are included (the costs for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges, and inland transport). Tariffs and trade taxes are not included. The average cost of the exporting country for the 2010–2013 period was used.
Public agricultural expenditure	This variable was included to examine the empirical link between public investment and trade performance. While it is highly relevant from a policy perspective, it may cause endogeneity problems and may also correlate with other explanatory variables. To avoid these problems, its lagged value was used for the regression analysis. The nominal value was normalized by agricultural GDP.
Regional trade agreements	This variable was included as a dummy variable, taking the value of 1 if both trading countries were members of the same regional economic community (COMESA, ECOWAS, SADC, and ECCAS), and otherwise zero. At a later stage dummy variables were also included for each regional bloc to measure the trade diversion effects of each REC. In this case, for example, a dummy for COMESA was included, taking 1 if the importing country was member of COMESA and otherwise zero. Similar dummies were used for the other RECs.

Determinants	Indicators and definitions
Tariffs	Aggregation is the primary concern for measuring the effect of tariffs on trade. The use of tariff indexes, such as the trade restrictiveness index, ad valorum equivalent, trade reduction index, and nominal rate of assistance, is quite common to aggregate the different tariff lines. These indexes are preferred over averages because simple averages of tariff rates of the different agricultural lines will include untraded products and the weighted average based on imports will be endogenous to trade. However, an all-inclusive index for all the countries considered in this study is not available. Thus, a mix of weighted and simple averages of ad valorum rates from WITS (2016) was used as a proxy for the effect of tariffs on trade. Weighted averages were used to aggregate tariff rates on products up to the HS2 level and rates imposed on different countries, and then simple averages were used to approximate a tariff rate imposed by a country on global imports. Since only exports of African countries were considered in the analysis, the weighted tariff rates of other countries are less likely to be endogenous to trade, as the share of imports from Africa is relatively small.
Nontariff measures	The total number of nontariff measures imposed by the importing country, which is the sum of all measures reported to the World Trade Organization (WTO 2016), was used to capture the effect of nontariff barriers on African trade. Measures were counted across products and types of measures. Alternatively, the frequencies of six major types of nontariff measures were used separately. Only measures applicable to all World Trade Organization members were considered. Nontariff measures imposed bilaterally were not considered because they are mostly for non-African countries. Unfortunately, not all countries reported to the World Trade Organization, so this variable had many missing values.
Domestic agricultural supports	Data on the extent of domestic agricultural support specifically for production and input subsides are not available for all countries. The ratio of the agricultural producer price index to the manufacturing producer price index for OECD countries was used as a proxy to represent domestic agricultural support. The agricultural producer price index was obtained from FAO (2016), and the manufacturing producer price index was collected from the OECD (2016).

Source: Authors.

Notes: COMESA = the Common Market for Eastern and Southern Africa; ECCAS = the Economic Community of Central African States; ECOWAS = the Economic Community of West African States; GDP = gross domestic product; REC = regional economic community; and SADC = the Southern African Development Community

6. MAJOR DEVELOPMENTS AFFECTING AFRICA'S TRADE PERFORMANCE: A SUMMARY OF KEY LITERATURE

Nicholas Sabwa and Julia Collins

Numerous regional and global issues, both within and beyond the agricultural sector, affect Africa's trade performance. Key issues include trends in national and regional production, consumption and demand; regional integration; international trade regimes; and constraints to linking farmers to markets. This chapter presents a summary of the current literature on these issues, answering strategic questions regarding opportunities and challenges affecting Africa's trade, some of which governments and other stakeholders can influence, and others which are less under the control of African countries and must be anticipated and responded to. As increasing agricultural production and cost efficiency are basic factors enabling the expansion of trade, productivity-enhancing interventions should play an important role in strategies to enhance trade, as well as actions to reduce the costs of trade and better integrate value chain actors. The chapter begins by summarizing key issues and trends in Africa affecting production, agroprocessing, and markets in the region. In the second section, it looks at broader global developments affecting Africa's agricultural trade performance. The third section presents interventions and mechanisms which could potentially be scaled up to allow Africa to take advantage of trade opportunities. The chapter concludes with recommendations for improving Africa's regional and global agricultural trade performance while increasing the resilience of agricultural producers.

Agricultural and Nonagricultural Developments Affecting Trade

Africa has undergone dramatic changes in the past two decades. After a long period of economic stagnation and rising numbers of poor, the continent embarked on years of strong economic growth in the 2000s, accompanied by rising living standards. Africa's agricultural trade expanded, with growth in exports and sharper increases in imports (see chapter 2, this volume); however, Africa's global and regional trade performance remains below its potential. Although the strong economic growth rates of the 2000s have decelerated somewhat, rapid socioeconomic and technological changes continue to occur, affecting the composition of demand, the structure of value chains, and prospects for future growth.

This section reviews developments occurring within Africa with the potential to affect its trade performance at the regional and global levels. These include socioeconomic changes affecting the volume and composition of food demand; the growth of domestic agribusiness; rising attention to sustainability in national development strategies; efforts to increase regional integration and raise the level of intra-African trade, which remains far below its potential; and the growth of information and communication technologies. In some cases, these developments may open up new opportunities to expand exports; in others they may affect Africa's trade balance by accelerating the growth in imports.

Growth in Consumer Demand and Rise of Agroprocessing

Rapid urbanization and an emerging middle class. Urbanization in Africa has risen rapidly over time. World Bank (2015) estimates that urban population growth will reach 56 percent by 2030, up from 36 percent in 2010, which presents significant opportunities for economic growth and social transformation. The demand for food in local, national, and regional markets is projected to increase fourfold by 2030, which will trigger demand for a wide range of

consumer goods and services. It is further projected that the African middle class will reach 1.1 billion people by 2060, up from 355 million people in 2010 (World Bank 2015). Such growth will bring significant challenges and opportunities for agricultural producers and the private sector, especially in the area of agroprocessing.

Rising incomes and urbanization have led to increased consumer spending. According to Hattingh et al. (2012), private consumption in Africa outstrips that of India and Russia combined. Africans living in urban centers are spending significant shares of their incomes on food compared with consumers in Brazil, China, India, and Russia. The study projects growth of more than US$419 billion on Africa's consumer-based industries between 2012 and 2020, signaling a major opportunity for business development and economic growth. Given African spending patterns, the study estimates that the textile and food sectors will account for about 45 percent of that amount, or US$185 billion.

Implications of dietary changes for agroprocessing and trade. Demographic changes are giving rise to shifts in diets and in the composition of food demand. Increasingly affluent consumers, subject to rising time pressures associated with urban lifestyles, are seeking higher-quality and more convenient foods. In addition to overall higher food demand, rising incomes have led to increased diet shares of processed foods and higher-value foods such as meat and dairy (Hollinger and Staatz 2015; Tschirley et al. 2015). These demand changes are creating opportunities for domestic producers and agroprocessing firms. Recent studies document rising numbers of local firms processing staples for urban consumption, including, for example, the rapid expansion of teff millers and retail shops providing teff flour and ready-to-eat enjera in Addis Ababa, and the development of branded ready-to-cook or ready-to-eat millet products in Dakar (Badiane and Ulimwengu 2017, Reardon et al. 2015).

However, rapidly increasing imports of processed and high-value foods are giving rise to concerns that the opportunities associated with rising demand in Africa will be seized by producers and firms in other regions (Traub et al. 2015). Projections of food consumption through 2040 in Eastern and Southern Africa (Tschirley et al. 2015) and in Western Africa (Zhou and Staatz 2016) suggest that overall food demand will continue to increase rapidly, and that much of this demand will be met by imports, in the absence of policy action and investments to raise productivity and upgrade domestic markets. In some cases, however, African agroprocessors are serving domestic markets by adding value to imported raw materials. Hollinger and Staatz (2015) point out that in West Africa, imports of unmilled wheat are growing faster than imports of wheat flour and processed wheat products including breakfast cereals and macaroni, suggesting that local firms are increasingly producing processed products themselves using imported inputs. Larger and more successful agroprocessors tend to be those which make use of imported inputs such as wheat, fruit juice concentrate, and powdered milk (Hollinger and Staatz 2015).

Growth in food demand also provides opportunities for the expansion of regional trade. An inventory of processed grain products for sale in Dar es Salam, Tanzania found that domestically produced processed products accounted for around 60 percent of the products inventoried, with products from neighboring countries accounting for another 10 percent (Snyder et al. 2015). In West Africa, strong projected growth in demand for meat in coastal areas offers potential for major expansion of intra-regional livestock exports from Sahelian countries (Hollinger and Staatz 2015). In general, the extent to which both regional and local producers and agroprocessing firms will capture the growing African food market will depend on African countries' abilities to raise productivity at all stages of value chain and increase the efficiency of markets and trade.

The Push for an Inclusive, Green Economy

Despite vigorous economic growth since the beginning of the 2000s, Africa's poverty rates are still the world's highest (ECA–AU–ADB–UNDP 2014). Increasing incomes and rapid population growth will increase stress on natural resources. Ensuring the inclusivity and

sustainability of the continued growth required to reduce poverty is a major challenge.

A number of African countries, such as Ethiopia, Ghana, Rwanda, Senegal, and South Africa, are already experimenting with green economic policies in order to ensure the environmental sustainability of economic growth, and several have developed green economy strategies (UNEP 2015). Green public procurement practices are enabling the development of markets for renewable energy, energy efficiency, and sustainably produced food in Ghana and South Africa (Hanks, Davies, and Perera 2008; Liebert 2012). Green development strategies have the potential to increase economic growth by addressing sustainability issues that would ultimately decrease productivity, as well as increasing employment opportunities (UNEP 2015). In addition, embracing green practices can open up new export opportunities. Global markets for sustainable products are growing faster than those for conventional products; African and other developing countries are likely to have comparative advantage in some sustainable natural-resource based products (UNEP 2013). In agriculture, opportunities for expanding exports include organic and fair trade products, as well as participating in sustainable sourcing efforts through business-to-business certification. Sustainable development of Africa's natural resources can also provide export opportunities outside of the agricultural sector; for example, Ghana is investing in increasing its capacity to export solar energy (UNEP 2016).

Advances in Regional Integration

Intra-African trade can create wealth and improve food security, and should be encouraged in response to global climate change and international food price volatility (Odozi 2015). Yet, at an estimated 20 percent, intra-regional agricultural trade in Africa is the lowest among world regions (see chapter 3, this volume). The Comprehensive Africa Agriculture Development Programme (CAADP), launched in Maputo in 2003 by the New Partnership for Africa's Development and the African Union, coordinates national agricultural strategies. Through the 2014 Malabo Declaration, Heads of State pledged to triple intra-African trade in agricultural services and commodities by fast tracking the creation of a continental free trade area by 2025. Meeting the Malabo goals requires the implementation of appropriate trade guidelines to assist intraregional trade in agricultural inputs and outputs (ECDPM 2014).

Deepening regional integration will help African countries both increase regional trade and more effectively participate in global value chains (Toledano 2015). This can be achieved by developing regional infrastructure to ensure a flexible agriculture and food sector that is able to respond to regional demand (European Union 2013).

Countries should also exploit current regional integration agendas to support crossborder trade and investments. Some countries and regional economic communities (RECs) have achieved more success in increasing economic integration than others and, consequently, have reaped rewards from lower trade barriers (Barclays 2015). The region's less industrially developed economies could learn from those already participating in global markets. Domestic enterprises have a higher probability of succeeding in regional markets initially. "Learning by doing" prepares these small businesses for the greater complexity of and competition within global markets (WEF 2015). As a result, lead firms in more regionally integrated countries are benefitting from economies of scale in production and distribution and enjoy expansive market access for end products. Many East African Community (EAC) and Southern African Development Community (SADC) countries are leaders in terms of regional linkages, having a propensity to work collaboratively in developing regional agricultural strategies and associated services. EAC has integrated quickly, largely due to opportunities arising from integrated trade policy and the willingness to enforce it (Barclays 2015).

Regional trade agreements and changes in trade barriers. An enabling environment is needed to increase the volume of agricultural exports both regionally and internationally through improved policies, regulatory frameworks, and institutional arrangements. The key strategic goal is to establish regulated and harmonized crossborder trade in agricultural produce. Regional trade and investment agreements (RTAs) are assisting in developing regional value chains and bolstering efforts to add value throughout Africa. Regional value chains exemplify the vast potential of RTAs to support broader cooperative efforts targeting trade liberalization, facilitation, and investment and the implementation of joint investment mechanisms and institutions (OECD, WTO, and UNCTAD 2013). A small number of RECs have achieved their intraregional trade targets, but—within Africa—the proliferation of multiple RTAs, institutions, and initiatives can at times constitute a barrier to progress on trade (Mbekeani 2013).

Reducing tariff and nontariff trade barriers is vital to increasing the competitiveness of African trade. Nontariff measures account for a large share of trade costs and limit the participation of African agribusinesses in global value chains, as well as hampering intra-African trade (WEF 2015; also see Chapter 7, this volume). Barriers range from trade policies, such as export bans, to regulatory failure that results in high transport, border-crossing, and agricultural input costs (Brenton, Portugal-Perez, and Regolo 2013). Lack of coordination across departments, onerous border procedures, weak crossborder cooperation, and corruption also constitute barriers to intra-African trade (Barclays 2015). To improve the unsatisfactory performance of Africa's logistics and transport sectors, deliberate efforts must be made to establish effective and more competitive licensing procedures (WEF 2015).

Some of Africa's RECs have played a role in increasing trade flows within Africa by reducing trade barriers. However, intraregional trade is still negatively affected by high tariffs; incompatible rules of origin; and issues with the implementation of trade policies and regulations (WEF 2015). To spur rapid growth, SADC is now promoting an agenda of industrialization by greatly reducing most tariffs. Member countries are enabling firms to take full advantage of the tariff reform by working to strengthen the enabling environment through improved port facilities, energy and water supplies, transport networks, and trade administration (Barclays 2015). ECOWAS is working toward achieving a free-trade area in the region by encouraging member state governments to remove barriers to trade (Hollinger and Staatz 2015).

Non-tariff barriers and regional trade. Policies related to standards and rules of origin can play significant roles in affecting market access and trade between countries. While liberalized agricultural markets require an effective standards system, enforcement regimes can present a barrier to trade in crops and farm inputs due to the low capacity of most countries to ensure adherence to regulations. In addition to the free movement of products across borders, regional food market integration would facilitate routine and less costly food safety checks, including control of disease and pests and plant health inspections (World Bank 2012).

World Bank (2012) reports that most African RTAs focus on harmonizing standards and instituting cross-country cooperation. Some RECs have begun developing frameworks for this purpose. The Common Market for Eastern and Southern Africa (COMESA), for example, has instituted regionally harmonized standards for around 300 commodities, including staple grains and cereals. In addition, the "COMESA Green Pass" is a harmonized sanitary and phytosanitary regime that includes a regional certification system. Other RECs—ECOWAS, EAC, and SADC—are also working to harmonize regional standards, but implementation is inadequate (within SADC, for example, as of 2012, only Swaziland and Namibia had adopted all 78 of the region's harmonized standards).

Current rules of origin unduly restrict market access among African countries. To increase foreign direct investment (FDI) and intra-industry trade within Africa, market access must be expanded; national-level reform is needed to streamline rules of origin and harmonize mutual standards (Mbekeani 2013). Promising initiatives exist but need development.

An example is the African Union's technical working group to evaluate the consistency of rules of origin in COMESA, EAC, and SADC (WEF 2015).

The rise of regional trade hubs and regional value chains. The expansion and advancement of strategic regional value chains offer significant trade opportunities. That is why most RECs have focused on regional value-chain development and market access as a means of promoting intraregional trade. As part of the Malabo Declaration, African leaders pledged to establish public–private partnerships to develop at least five strategic regional value chains strongly linked to smallholder agriculture (ECDPM 2014).

Given Africa's high and increasing level of food imports, significant scope exists to expand intra-regional food trade through greater integration of national and regional markets. Growing specialization of crossborder value chains presents further potential for development, growth, and job creation and has contributed to changes in trade and investment patterns and trade policy (OECD, WTO, and UNCTAD 2013). The growing importance of rice in national consumption and in trade in West Africa, for example, has enabled Nigeria to become the hub of a strategic regional value chain. Nigeria is a huge rice producer and consumer in the West Africa region and any policy actions it takes have impacts across the region.

The Barclays 2015 Africa Trade Index assesses African countries on their openness, market opportunities, and connectivity. Several East African countries receive high ratings, partly because of the region's economic growth and increasing regional integration. Kenya, which is ranked third in the index after South Africa and Nigeria, serves as a hub for East African trade and has a leadership role in facilitating intraregional trade and advocating for harmonized regulations and policies. Ethiopia and Tanzania also perform well in the index, reflecting the growing importance of East Africa as a global, as well as intraregional, trade hub (Barclays 2015).

The private sector is responding positively to the above developments. Private firms are increasingly investing in the infrastructure needed to expand their operations, which contributed to an 8 percent increase in intra-African investments during 2009–2013. Shoprite, a South African supermarket chain that has developed distribution centers, has helped to facilitate crossborder trade, including power generation and transport infrastructure (Barclays 2015).

Expansion of regional infrastructure and development of trade corridors. The development of effective regional infrastructure systems opens up opportunities and enhances competition. Greater investment in prioritized infrastructure at national and regional levels will promote trade, provided there is sufficient political will to do so. Multi-country resource-based development corridors can be an important tool to promote regional trade. By leveraging economies of scope, such corridors subsequently support investment in multiple types of infrastructure—such as electric power, fiber optic cables, and water distribution—and facilitate the development of other sectors, including agriculture (Toledano 2015). A study by Barclays (2015) showed that East and Southern Africa are frontrunners in the development of major strategic transport infrastructure, such as the Nacala corridor in Zambia, Malawi and Mozambique; the Beira corridor connecting several southern African countries with Mozambique's port of Beira; and the Lobito corridor linking the Democratic Republic of the Congo, Zambia, and Angola. Kenya's strategic development of the Northern Corridor Transport and Transit Authority is an important promoter of regional integration within East Africa. The country's location as a transport gateway to the region stands to create immense opportunities, especially for the region's landlocked countries (Barclays 2015). Kenya's LAPSSET corridor will link a new port at Lamu with South Sudan, Ethiopia, Kenya, and potentially Uganda. When other enabling elements are in place, such regional corridors can provide impetus for deeper regional integration (Toledano 2015).

Deepening regional financial integration. Most FDI to African countries originates outside Africa; however, intra-African FDI is growing. During 2009–2013, over 18 percent of announced crossborder greenfield investment projects (that is, those involving new construction and infrastructure) originated in other African countries, compared with under 10 percent during 2003–2008. A large share of intra-African FDI is subregional, remaining within the same REC. Intra-African investment is particularly important for non-oil exporting countries. Nearly all intra-African FDI flows to the service and manufacturing sectors, unlike investments from outside the continent (IMF 2015b). The banking sector, in particular, benefits from intra-African FDI, especially in the Economic Community of West African States (ECOWAS), where Nigeria and Togo have seen their banking sectors grow rapidly (Beck et al. 2014; IMF 2015a). The growth of crossborder banking has been an important vehicle for regional financial integration. The number of crossborder branches of African banks more than doubled between 2005 and 2012, increasing much more rapidly than branches of banks from outside the region. Most Pan-African banks are headquartered in Kenya, Nigeria, or South Africa; the largest is Ecobank, based in Togo (IMF 2015b).

Uptake and Upscaling of Information and Communication Technologies

New information and communication technologies (ICTs) have become highly effective tools driving agricultural development and transformation. Across Africa, innovation hubs are flourishing, nurturing future technologists (Africa Progress Panel 2014). Rapid expansion of ICTs in Africa in recent years has presented huge opportunities for agribusiness value chains and allowed major improvements in their performance (WEF 2015). More importantly, ICTs are attracting thousands of educated African youth into agribusiness value chains in countries like Kenya. Educated African youth value innovation, technology, and entrepreneurism. ICT-literate youth now operate intensive, efficient, and profitable climate-smart farms that produce a diverse array of products, both for supermarket chains and niche markets. They are also developing relevant, localized, and dependable mobile applications with potential to significantly increase farm profitability.

ICTs have revolutionized information access needs of smallholder farmers, other value chain actors, governments, and consumers. Agronomic information on inputs and planting seasons and advisory services can now be easily accessed via user-friendly ICT platforms. The impact of ICTs has been particularly strong for smallholder farmers, increasing their uptake of new technologies, expanding their economic opportunities, redressing some of the information asymmetries they face, and increasing their efficiency. ICTs are also connecting farmers to knowledge networks and providing real-time information on market prices, weather conditions, and financial resources and services including credit and insurance. The importance of social media as a tool for marketing and client interaction is rising. ICTs are also providing the means to track the progress of crops, animals, and products along the value chain, from farm to purchase, providing the necessary information for traceability by the increasing number of highly informed and health conscious urban consumers (Table 6.1) (KPMG International 2013).

ICTs, particularly mobile phones, have often been found to increase market efficiency and integration within a country and to facilitate farmers' access to markets (e.g. Jensen 2007, Aker 2008, Muto and Yamano 2009). The impact of ICT on international agricultural trade has been less studied. To the extent that they reduce production costs, ICTs can be expected to improve countries' trade competitiveness. ICTs can also reduce trade costs; for example, internet usage by businesses has been found to facilitate exports (Yushkova 2013). In addition, ICTs have the potential to help farmers access international value chains by improving their ability to meet traceability requirements (Karippacheril, Diaz Rios, and Srivastava 2017). Mobile and web-based virtual markets which connect buyers and sellers can facilitate and improve the efficiency of international as well as domestic trade. The virtual marketplace and

market information service operated by Esoko in Ghana and several other countries was found to simplify the procurement process for a plant product exporter and increase the producers' and traders' share in the export price (Donovan 2017).

Table 6.1. The use of information and communications technologies to transform African agriculture and trade

Stage/focus	Area of impact
Pre-cultivation	Selecting crops, enhancing land and water use, developing insurance products
Crop cultivation and harvesting	Generating information on crop health, land preparation, planting, input management (for example, fertilizer selection), water management, and pest management
Postharvest	Providing product and price information to address information asymmetries and increase market efficiency
Smart farming solutions	Facilitating precision agriculture through variable rate technologies for agricultural inputs, data-driven farming, field monitoring, soil sampling, and yield monitoring; supporting agricultural advisory services and extension; enabling enhanced market information, such as weather conditions; providing access to agri-webinars on subjects like farm business management, traceability of food and animal products, and market prices.
Digital finance Solutions	Providing easy access to financial services, mobile banking solutions, mobile transactions, rural savings, mobile crop insurance and remittances, and seamless cash payments; increasing smallholder participation in commodity exchanges, by allowing them to secure better commodity prices for their produce.
Value chain coordination	Increasing competitive advantages through ICT tools for marketing, procurement, distribution, logistics, and post-purchase e-services.

Source: Constructed by author based on WEF (2015) and Maumbe (2012).

Global Agricultural and Nonagricultural Developments Affecting Trade

Beyond developments occurring in African countries, trends at the global level have major impacts on Africa's ability to meet its trade potential. These include broad economic patterns and scientific developments; relationships with international trade partners and their food safety and quality requirements; and the global threat of climate change.

This section briefly describes some major global developments that can be expected to impact Africa's trade positively or negatively. In some cases, African countries have little control over the way these broader trends unfold, but have choices as to how they respond; in other cases they can usefully participate in international efforts to influence the trends and achieve better outcomes.

Integration within Global Value Chains

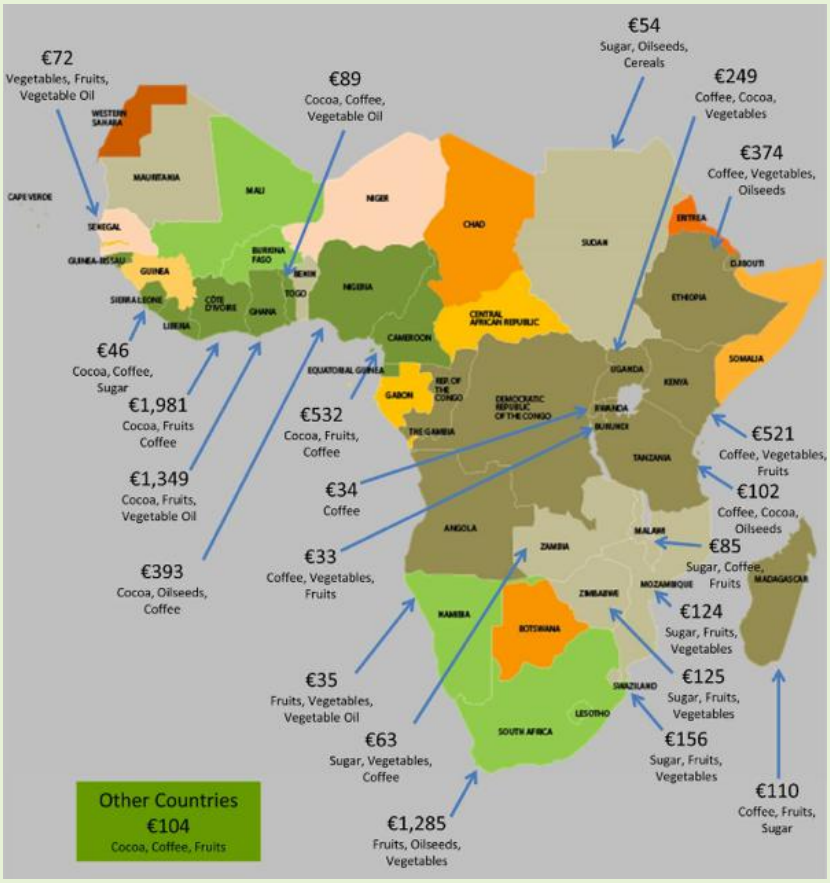
African countries have seen growing success in participating in global agricultural value chains, most often as providers of unprocessed products (Balié et al. 2017). Subsectors in which African countries have played major roles in global value chains include topical beverages; cotton, particularly from West Africa; cut flowers from Kenya and recently Ethiopia; and fruits and vegetables from Kenya and West Africa. However, the increasing complexity of requirements imposed by importing countries present new challenges in successfully accessing high-value markets. The ability of African countries to maintain and increase participation in global value

chains will depend on the ability of both private and public sector stakeholders to adequately coordinate sector activities and institutional arrangements as well as the provision of necessary services, including extension and capacity strengthening for producers; access to required inputs and equipment; and market and transport infrastructure.

Compliance with food safety standards and certification requirements. Global high-value food markets demand stringent compliance with international standards. Increased investment in agroprocessing and greater access to dynamic value-added markets would require the adoption of acceptable certification protocols. In efforts to comply with these global requirements, smallholder farmers are often unable to participate, as has been the case with Kenya's lucrative horticulture industry. A number of countries and private companies are assisting producers in implementing and applying international certification requirements (Africa Progress Panel 2014).

Growing concern over health risks associated with imported food products has prompted revisions in sanitary and phytosanitary (SPS) standards in industrialized countries. According to Brenner (2014), recent changes in aflatoxin standards in the European Union (EU) will likely reduce the export of African nuts, dried fruit, and cereals by 64 percent, resulting in a loss of US$670 million. In 2012, EU imports of SSA commodities that may be affected by standards compliance amounted to €7.9 billion (Figure 6.1). SSA is Europe's main supplier of cocoa and a major provider of coffee and tea. Several African countries exported millions of euros worth of cane sugar, molasses, and nuts and fruits to Europe in 2012.

Figure 6.1. African exports potentially affected by revisions to European Union food safety standards, three highest-value products by country, 2012



Source: Brenner (2014).

Compliance with international standards requires public and private sector participation. In Kenya, green bean producers and exporters have been successful in making the required adjustments to meet increasingly strict EU food safety standards (World Bank 2013). This has involved certifying producers according to the new standards and developing market infrastructure including cold chains and certified packaging facilities. The Kenyan government invested in road and air transport infrastructure and provided extension services and market information, while the private sector played a key role in coordinating producers. Originally, large exporters contracted with smallholder producers, helped them access inputs and equipment, and provided technical assistance and monitoring. Later, producer organizations took on the role of coordinating smallholders. As requirements grew more stringent, certification costs grew too onerous for smallholders, and the green bean export industry became increasingly dominated by larger producers. However, smallholders continued to produce green beans for the domestic markets, and employment opportunities on large farms have provided other income opportunities (World Bank 2013).

Imported inputs also played an important role in allowing Kenyan producers to meet international standards (World Bank 2013). Research suggests that governments can help producers and processors access higher-value processed food export markets by reducing tariffs that raise the cost of imported inputs and equipment (Fukase and Martin 2017).

Increased Multilateral and Bilateral Trade Negotiations

The recent signing of economic partnership agreements between the European Commission (EC) and Africa's RECs may encourage increased engagement with Africa from the United States and Asian countries, as they seek to keep or retain access to markets and suppliers (Barclays 2015). Key developments are discussed below, which offer major opportunities for African exports as well as potential challenges.

Economic partnership agreements. Economic partnership agreements (EPAs) between the EC and three RECs—EAC, ECOWAS, and SADC—were completed in 2014 (Barclays 2015). The agreements are reciprocal free trade agreements with development objectives that replace previous unilateral preference arrangements. The agreements ensure access to European markets for African exports, at the same time giving African countries the ability to protect certain products in their markets (Ramdoo 2014). Proponents of the EPAs suggest that they will support both global and regional integration of African countries and catalyse agricultural investments and economic transformation (EC 2016a; EC 2016b). However, others have argued that African industries could be harmed by competition from European imports (Njehu 2015) and that growth in trade with Europe may reduce intra-African trade—an effect that can be mitigated by more concerted efforts to establish a continental free trade area in Africa (Karingi, Mevel and Valensisi 2015). Capacity building support and value chain development initiatives can help African countries to derive greater benefits from the EPAs (Woolfrey and Bilal 2017).

Africa Growth and Opportunities Act. The U.S. Act allows duty-free entry for a wide range of imports from qualifying African countries. It was extended for another ten years in 2015. SSA's clothing industry has been considerably affected by the Act, which has played a key role in supporting the region's textile manufacturers. The Act has also helped African countries to increase exports of processed foods and other products to the United States and has contributed to significant growth in trade, with total African exports under the program quadrupling, and trade between Africa and the United States doubling since its launch. The Act is estimated to have created 300,000 jobs in Africa due to the growth of non-oil export industries, as well as 120,000 jobs in the United States (Thomas-Greenfield 2015).

Engagements with Asian giants. Chinese investors, who are beginning to see Africa as more than simply a source of resources, are turning their attention to the region's rapidly

expanding middle-class consumers. Chinese companies are initiating production operations in Africa to supply African markets, as well as Europe and the United States through their trade deals with Africa. India and Japan, in contrast, are scaling up involvement in Africa through the provision of technical and financial assistance in support of development goals. Gulf states and other Middle Eastern countries are also incresing their interactions with Africa in sectors including logistics, air transport, trade facilitation, and consumer goods (Barclays 2015).

The Impact of Oil Shocks on Agriculture and the Search for Alternative Energy Sources

Africa's major oil- and commodity-exporting countries have tended to rely on a few export products, demonstrating a lack of policy action toward open trade and diversification, which has negative implications for other sectors of the economy with trade potential. Aside from the recent period of shocks in international oil markets, oil-producing countries like Nigeria typically have been less interested than non-oil producing countries in investing in other productive sectors (Barclays 2015). After the drastic fall in oil prices in the recent past, the Nigerian government is looking to agriculture as a potential source of foreign exchange. However, incentives—such as the export expansion grant—need to be reviewed to encourage agri-food exports. In 2015, the EU placed restrictions on Nigerian agricultural exports based on perceived concerns over quality and safety. Both federal and state government support is therefore critical, not only in raising quality standards, but also in interacting with foreign agencies in addressing this trade mitigating issue (PricewaterhouseCoopers 2016).

Climate Shocks and Adaptation

One of the most important challenges to agricultural production is climate change (IPCC 2012). Countries that are heavily dependent on rainfed agriculture must strengthen their institutional and infrastructural capacities to cope with climate variability. This is necessary to reduce their vulnerability to seasonal shifts and unpredictable precipitation patterns. In the past several decades, temperature variability and extremes, rainfall, and drought have increased, especially in tropical and subtropical areas (IPCC 2012). Changing weather patterns are beginning to have effects on agricultural production in Africa, which will likely increase without significant efforts to adapt. The United Nations Environment Programme's Africa Adaptation Gap Report finds that yields in Africa south of the Sahara (SSA) could drop significantly by mid-century in response to climate change (Schaeffer et al. 2013). More than 10 million people were affected by the 2011 drought in the Horn of Africa and resulting famine, which cost 257,000 lives (Munang and Andrews 2014a). Climate change is also highly likely to affect Africa's trade potential.

Climate change will have far-reaching impacts on African trade, through its effects on infrastructure and trade routes, as well as agriculture. Rising sea levels are expected to result in significant damage to port infrastructure in a number of African cities (Munang and Andrews 2014b). Global trade routes will be affected both by damage to infrastructure and changing climatic conditions which could open new routes while rendering others nonviable. Increases in the costs of trade caused by these changes will affect everyone, in particular developing countries participating in global value chains (Tamiotti et al. 2009). Despite the expected negative impacts of climate change on African agriculture, effects on its agricultural trade are complex and will depend on climate impacts in other world regions and on countries' adaptation capacities. For example, IFPRI IMPACT model simulations suggest that Africa's net cereal imports will decrease in the presence of climate change, due to lower production in other cereal-producing regions and increased prices; reduced imports as well as lower cereal production in Africa will negatively affect cereal consumption and food security. However, impacts on hunger can be offset by investments to improve productivity growth, water management, and market efficiency (Wiebe et al. 2017).

In spite of the emerging threats, some smallholder farmers are finding innovative ways to adapt—increasing resilience by adopting "climate-smart" agricultural practices (Africa Progress Panel 2014). Simulations suggest that the adoption of climate-smart practices in Africa has the potential to increase net exports compared to expected trends by mitigating yield losses due to climate change (Haile et al. 2017). Increasing the capacity to anticipate and respond to the effects of climate change is a key requirement for developing countries. In addition, financial assistance and technology dissemination must be promoted in the context of any global agreement on trade and climate change (World Bank 2010).

Biotechnology and Genetically Modified Organisms

The biotechnology choices confronting Africa go beyond the issue of importing genetically modified organisms: biotechnology presents Africa with the opportunity to build technical capacities to take advantage of agricultural adaptation technologies. Biotechnology, alone, is not sufficient, however, and increasing biotechnology capacities should be combined with more comprehensive upgrades of agricultural production systems. Transgenic crops are currently grown in just four African countries (Burkina Faso, Egypt, South Africa, and Sudan), although several other countries are conducting research and development (Juma and Gordon 2014). In addition, Swaziland and Ethiopia approved the commercialization of transgenic cotton in 2018 (COMESA 2018), and Nigeria is expected to commercialize transgenic cotton and cowpeas in 2018 (Isaac 2017). Although wider use of productivity-enhancing technologies has the potential to increase agricultural trade, concerns that the presence genetically modified crops could affect access to European markets have slowed their adoption in Africa (Adenle 2012).

Potential Interventions to Take Advantage of Trade Opportunities

Africa is still performing below its potential, in terms of both global and intra-regional trade. Recent growth in trade provides a hint of the potential for further expanding Africa's role in global markets and enhancing regional integration. The global and local developments reviewed earlier present challenges and opportunities for expanding agricultural trade with and outside of Africa. In the context of these possibilities, this section reviews promising interventions and mechanisms which could allow countries to increase productivity, integrate value chain actors, increase market efficiency, and expand trade.

Accelerated Agribusiness and Value Chain Development

African governments have demonstrated renewed focus on agriculture in efforts to trigger economic transformation by constructively engaging the private sector. Research in some African countries demonstrates that agricultural growth has a far greater effect on poverty reduction than nonagricultural growth (World Bank 2008). Significant agribusiness opportunities are encouraging private-sector involvement and promoting economic growth and development through the creation of critical links between agriculture and industry to produce high-quality value-added products. Innovative "outgrower" programs, under which farmers are integrated into value chains through processing companies and other inclusive models of agricultural development, should be encouraged. For example, in one program in Malawi, contracted farmers produce sugarcane for a multinational South African company that exports to Europe. In Ghana, pineapple producers supply a company that sells to large supermarket chains (Africa Progress Panel 2014).

Improving market access for smallholders. Increasingly, globalized agricultural trade offers important opportunities for African agriculture, as shown by the success of horticulture

in Kenya. Nevertheless, as discussed earlier, many barriers prevent smallholders from accessing global value chains, including the high financial costs associated with meeting international standards. Cooperatives, government interventions, and private initiatives can help to link smallholders with other actors in the value chain and improve their access to financing. For example, challenge funds may be used by donors to improve market access for smallholders (Africa Progress Panel 2014). The Africa Enterprise Challenge Fund (AECF) provides grants and loans for private firms to invest in agriculture and agribusiness, renewable energy, and rural financial and communications services. The goals of AECF are to mobilize additional private investment and assist the rural poor through improved access to markets and technology (Africa Enterprise Challenge Fund 2016). In Sierra Leone, AECF funding aided in the founding of a company that purchases cocoa from thousands of farmers (AfricaProgress Panel 2014). The United Kingdom's Food Retail Industry Challenge Fund (FRICH) is another initiative that supports 25 projects for farmers in over a dozen African countries by bringing their produce to European markets. FRICH supports projects in the Democratic Republic of the Congo, Ethiopia, Ghana, Kenya, Malawi, Namibia, Rwanda, São Tomé and Príncipe, Senegal, Uganda, and Zimbabwe involving producers of coffee, tea, juice, beef, fish, flowers, palm oil, and other products (DFID 2013).

Development of Commodity Exchanges

Smallholder farmers face many obstacles in reaching markets, including lack of market information, storage capacity, and the ability to share risk and information with other farmers based on their geographical remoteness. Increasing access to markets and market information improves farmers' bargaining power and allows them to make better-informed decisions about production and marketing. The Ethiopia Commodity Exchange (ECX) demonstrates the potential of institutions to link smallholder farmers to markets, and share the benefits of agricultural growth more widely. In addition to facilitating agricultural commodity sales, ECX provides market information and manages a certification system that ensures a premium price for high-quality output. As of 2013, ECX had handled around US$5 billion in the trade of coffee, maize, legumes, wheat, and other commodities (Africa Progress Panel 2014). In addition, market data is provided through telephone messaging in four languages. Users make around 20,000 toll-free calls per day to receive information on prices (World Bank 2009). Similarly, the Kenya Agricultural Commodity Exchange (KACE) disseminates market information to farmers and other value-chain actors for multiple commodities via SMS and the Internet (Mukhebi et al. 2007).

Increasing the Use of Warehouse Receipt Systems

Warehouse receipt systems are an innovative risk management strategy that enables farmers to store their crops in private warehouses and receive a receipt—that can be sold or used as loan collateral—specifying the quantity and quality of the commodity as proof of ownership. The system helps farmers and buyers manage risk in several ways. First, the system can mitigate seasonal price fluctuations by allowing farmers to store commodities during periods of low prices and sell when prices are higher. Second, the system facilitates farmers' access to credit by providing receipts that serve as collateral. Third, the system makes large quantities of a given quality of agricultural produce available for governments, processors, or aid agencies (World Bank 2012). Similar systems have been in use for traditional export crops such as coffee but are less developed for cereal crops (CTA and EAGC 2013). Broader use of warehouse receipt systems could potentially facilitate international trade for a wider range of crops as well as increasing the efficiency of domestic markets. However, in order to preserve incentives for private sector storage systems, governments should refrain from actions including export bans and price controls which would negatively affect market stability and predictability (World Bank 2012).

Enhancing Agricultural Market Information Systems

Agricultural Market Information System (AMIS) is a global initiative of the G20 designed to enhance the availability of information on national and international agricultural markets and trade. Participants include the G20 countries plus Spain, as well as a limited number of non-G20 countries that play a large role in agricultural commodity trade, such as Egypt and Nigeria. AMIS monitors food availability and helps major agricultural exporters and importers to better coordinate trade policies (Agricultural Market Information System 2015). Regional market information systems would also benefit African countries by enabling them to enact trade policies that better account for regional food availability. Some progress has been made by African RECs, such as the regional food balance sheets being developed by COMESA and EAC. International partners can play a role in supporting these efforts to improve agricultural market information in Africa (World Bank 2012).

Developing Futures and Options Markets

Futures markets, which offer contracts for food commodities to be fulfilled at a future date, offer one method of ensuring that food supplies remain available without maintaining physical reserves. In order to allow for effective hedging against price risks, contracts must be credible and provide countries with the options (a) of buying given quantities for a previously determined maximum price, or (b) of declining to execute the contract in the event that existing food supplies are sufficient. African countries have very few high-volume futures markets, however. The best example is the South African Futures Exchange (SAFEX), which offers call options on futures contracts for yellow maize, white maize, sorghum, and wheat. Contracts are purchased and may be executed or closed according to a country's needs, and physical commodities do not change hands unless contracts are executed. The government of Malawi has used SAFEX contracts to save an estimated US$60 per ton over spot (that is, current) prices for imports (Nijhoff 2009). Futures and options markets present interesting potential to insure against food price risks. Sufficient funds must be available to purchase commodities from futures markets (which could take the form of a regional fund). Governments will need to determine whether the private sector can play a role in using futures markets to offset risk (World Bank 2012).

Fostering Domestic Financial Systems

Access to finance, especially trade finance, is cited by many developing-country firms as the top constraint to engaging with modern value chains and increasing their own value added. With financial costs barring many firms from importing and exporting, improving financial systems can increase trade by lowering costs and expanding access (WEF 2015). Governments seeking to link domestic agribusiness firms with global value chains should prioritize increasing access to export credits and trade finance (WEF 2015). Several African countries—including Kenya, Nigeria, and South Africa—have greatly improved the functioning of their financial systems, but systems remain limited and inefficient in other countries (Beck and Cull 2014). Further advancement in financial sectors will be required to facilitate the investments necessary to allow African firms to increase their value added and their access to value chains (WEF 2015).

Improving access to financial services through innovation. Kenya's experience demonstrates the potential for rapidly expanding access to financial services through mobile technology. M-Pesa, a virtual money transfer platform launched in 2007 by Safaricom, allows customers to make transactions using mobile phones. M-Pesa has more than 20 million subscribers, more than the combined total of Kenya's five largest banks; related platforms linked to M-Pesa provide access to insurance, loans and other services (Africa

Progress Panel 2014). M-Pesa is used not only for person-to-person transactions, but also increasingly for purchases of goods and services (Omondi 2016). M-Pesa has the potential to go beyond simplifying domestic payments in Kenya to facilitate crossborder trade in the Eastern Africa region. Member States of the East African Community are working to put the required regulatory framework in place to advance the development of a regional electronic payment system (ITC 2015).

New Approaches to Climate Risk Insurance

Governments in rich countries provide farmers with subsidized crop insurance that protects them from weather-related risk. As weather shocks increased, spending on crop insurance by the U.S. Federal Emergency Management Agency more than doubled between 2001 and 2012. Most African farmers, in contrast, have limited or no access to weather insurance, and largely rely on savings to cope with shocks. African farmers and other value-chain actors require innovative mechanisms to manage their risk (Africa Progress Panel 2014).

Uninsured risk creates a disincentive for farmers to invest in productivity-raising technologies, and represents a key constraint to agricultural development. Significant potential exists for scaling up affordable index-based insurance for weather risk, which provides payouts in response to climate variables measured at a weather station.

Promising examples of index-based insurance include the Index-Based Livestock Insurance program in Kenya, and Kilimo Salama ("Safe Agriculture") in Kenya and Rwanda (Africa Progress Panel 2014). In order to be compliant with World Trade Organization (WTO) rules, insurance programs for agricultural producers must meet a number of criteria, the most basic being that they have no or minimal impacts on production and do not distort trade. However, some of the WTO criteria may not be compatible with the needs of viable insurance programs, both in developed and in developing countries; changes have been proposed, including by the African Group of the WTO (Glauber 2015; Dhar 2009; Oduro 2009). Other efforts beyond insurance are needed to help farmers increase their resilience to climate risk, including encouraging the adoption of climate smart agricultural practices.

Significantly Reducing Postharvest Losses

According to estimates by the African Post-Harvest Losses Information System, as much as 10 to 20 percent of grain could be lost prior to processing. Sharply reducing postharvest losses is an important avenue for improving food and nutrition security. Agricultural extension can help to lower these losses by disseminating technical innovations at the harvesting, cleaning, and storage stages. In addition, action is required to facilitate transport, improve trade regulations, and streamline border procedures that in some cases result in unnecessary handling of and damage to commodities (World Bank 2012).

Building Capacity

Major strides are required in the development of requisite human capital to allow countries to participate more fully in global markets. This is in response to increased competition in a dynamic global marketplace that now focuses more on high-quality, safe, and nutritious food products that comply with international standards. One challenge is to enhance the capacity of smallholder farmers to understand and meet international standards. Beyond the farm level, capacity strengthening for multiple actors, including national governments, is necessary to improve trade regimes. The EU is working to help African countries raise SPS standards through its support of the Standards and Trade Development Facility (STDF), which works to help countries comply with international rules on SPS measures to ensure food

safety and protect plant and animal health. The STDF promotes the adoption of electronic SPS certification systems, disseminates knowledge on good regulatory practices to improve SPS implementation, and helps countries assess and prioritize SPS-related investments, among other interventions (STDF 2017). Improving food safety is part of the technical cooperation being provided to develop standards. The Pesticides Initiative Programme, for example, aims to assist private fruit and vegetable exporters from African, Caribbean, and Pacific countries to meet the Europe's stringent requirements for traceability and food safety (Disdier et al. 2008)

Key Recommendations

Africa has made significant progress during recent decades in accelerating agricultural growth and improving agricultural trade performance. Global agricultural exports have steadily increased. Efforts at the continental level and among RECs to advance regional integration and facilitate trade have enabled Africa to increase competitiveness in regional markets and expand intra-Africa trade. However, with regional trade shares remaining lower than other world regions, much work remains to be done. In addition, Africa's share of global agricultural trade remains low, and most major African exporters have seen little improvement in global competitiveness (see Chapter 4, this volume).

Several recent developments present the potential to allow the continent to further improve its trade performance. ICTs are enhancing the flow of production and market information, and countries are making progress on designing regulations to enable the deployment of biotechnology. Institutional innovations such as mobile financial services, climate insurance, commodity exchanges, warehouse receipt systems, and futures markets can help to increase productivity and lower trade costs. Examples such as Kenya's participation in global horticulture value chains have demonstrated the ability of the public and private sector to work together to improve agricultural and trade performance. Income growth at home and other demographic changes have led to burgeoning demand for food overall and higher value food in particular, offering income opportunities for producers and processors as well as potential for increased regional trade.

However, daunting challenges remain, including high trade costs, inadequate linkages between producers and value chains, and the increasing negative impacts on agricultural of climate change. The following recommendations are suggested to enable African countries to take advantage of new opportunities and build on recent progress in regional and global trade.

Agricultural productivity growth is central to improved trade performance. Income growth, demographic changes and burgeoning food demand in Africa present remarkable opportunities for local production, but to capture those opportunities, agricultural productivity growth must be sustained. Investments in agricultural productivity will catalyze broader economic growth and transformation, in addition to improving Africa's competitiveness in global markets. African governments should make greater efforts to meet the CAADP goal of allocating 10 percent of public expenditures to agriculture, and development partners should increase support to national agricultural strategies. Governments should also allocate greater expenditures to agricultural research and development in order to develop and adapt productivity-enhancing technologies.

Value chains development and upgrading is necessary to enable expanded trade. Taking advantage of opportunities to meet food demand and expand exports requires integrating smallholder farmers into value chains and enhancing productivity along the value chain. Innovative financial products should be scaled up to allow farmers to access inputs and other technologies. The potential of ICT products to link farmers to upstream service providers as well as downstream markets, and to enhance their productivity on the farm through better access to information, should continue to be explored. ICTs can also enhance connections between actors at all stages of the value

chain and facilitate adherence to traceability requirements for international markets. Farmers and agroprocessors need support to participate in global value chains, including capacity strengthening to meet food safety and quality standards required by global markets.

Governments can provide an enabling environment for value chain development and expanded trade through public investments in infrastructure: better roads are needed to reduce trade costs associated with transport, and expanded and more reliable energy would facilitate productivity-enhancing investments by producers and agroprocessors. In addition, governments have an important role to play in strengthening market institutions and providing leadership for the development and implementation of standards and certifications, provision of market information, and ensuring contract enforcement.

More needs to be done to remove barriers to trade and market integration. Countries and regions should continue to promote the free movement of people, goods and services across the continent. Further efforts are needed to enhance regional integration and increase trade flows in order to take advantage of the potential of regional trade to stabilize food markets. In order to meet the Malabo Declaration goal of tripling intra-regional trade in agricultural goods and services, Africa's countries and regional economic communities must advance efforts to harmonize food safety and quality standards and regulations as well as reducing other barriers to crossborder trade. Trade facilitation efforts should include streamlining customs and border procedures, reducing harassment costs to traders, and upgrading transport infrastructure.

Greater efforts to increase sustainability and resilience to climate change are required. Climate change is already affecting agricultural production in Africa, and extreme weather events as well as shifts in underlying climatic conditions will only increase in the future. African countries should expand efforts to enhance resilience to climate shocks and play a greater role in global efforts to address climate change. Smallholders need be provided with information and support to adopt climate-smart agriculture techniques to offset yield losses under climate change. Insurance products to protect farmers from climate risk, as well as expanded social safety nets, are important elements of efforts to increase resilience. In addition, African governments should continue early efforts to ensure the environmental sustainability of their development strategies.

References

Adenle, A. A. 2012. "Are Transgenic Crops Safe? GM Agriculture in Africa." United Nations University. January 19, 2012. Accessed July 24, 2018. https://unu.edu/publications/articles/are-transgenic-crops-safe-gm-agriculture-in-africa.html.

Africa Enterprise Challenge Fund. 2016. "About AECF." Accessed March 6, 2017. www.aecfafrica.org/about-us.

Africa Progress Panel. 2014. *Grain, Fish, Money: Financing Africa's Green and Blue Revolutions.* Africa Progress Report 2014. Geneva. http://app-cdn.acwupload.co.uk/wp-content/uploads/2014/05/APP_APR2014_24june.pdf.

Aker, J. C. 2008. *Does Digital Divide or Provide? The Impact of Cell Phones on Grain Markets in Niger.* Center for Global Development Working Paper 154. Washington, DC.

Agricultural Market Information System. 2015. "About AMIS." Accessed August 25, 2016. www.amis-outlook.org/amis-about/en.

Badiane, O., and J. Ulimwengu. 2017. "Business Pathways to the Future of Smallholder Farming in the Context of Transforming Value Chains." *In Africa Agriculture Status Report 2017:*

The Business of Smallholder Agriculture in Sub-Saharan Africa, edited by Daudi Sumba, 25–44. Nairobi: Alliance for a Green Revolution in Africa (AGRA).

Balié, J., D. Del Prete, E. Magrini, P. Montalbano, and S. Nenci. 2017. *Agriculture and Food Global Value Chains in Sub-Saharan Africa: Does Bilateral Trade Policy Impact on Backward and Forward Participation?* IMT Lucca EIC Working Paper Series #03/2017. Lucca, Italy: IMT School for Advanced Studies Lucca.

Barclays. 2015. *Barclays Africa Trade Index: Openness and Opportunity*. London.

Beck, T., and R. Cull. 2014. *SME Finance in Africa*. Policy Research Working Paper 7018. Washington, DC: World Bank.

Beck, T., M. Fuchs, D. Singer, and M. Witt. 2014. *Making Cross-Border Banking Work for Africa*. Bonn and Eschborn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Accessed March 6, 2017. https://openknowledge.worldbank.org/bitstream/handle/10986/20248/892020WP0Makin00Box385274B00PUBLIC0.pdf?sequence=1.

Brenner, K. 2014. *Potential Trade Effects on World Agricultural Exporters of European Union Regulations on Endocrine Disruptors*. Accessed March 6, 2017. http://www.dtbassociates.com/docs/EURegsEndocrineDisruptorsTradeEffects2-2014.pdf.

Brenton, P., A. Portugal-Perez, and J. Regolo. 2013. *Food Prices, Road Infrastructure, and Border Effects in Central and Eastern Africa*. Policy Research Working Paper 7003. Washington, DC: World Bank.

COMESA (Common Market for Eastern and Southern Africa). 2018. "Two COMESA States Approve Insect-Resistant Bt- Cotton for Cultivation." June 12, 2018. Accessed July 24, 2018. http://www.comesa.int/two-comesa-states-approve-insect-resistant-bt-cotton-for-cultivation/.

CTA (Technical Centre for Agricultural and Rural Cooperation) and Eastern Africa Grain Council (EAGC). 2013. *Structured Grain Trading Systems in Africa*. Wageningen and Nairobi.

DFID (Department for International Development). 2013. "Guidance: Food Retail Industry Challenge Fund (FRICH)." Accessed March 6, 2017. www.gov.uk/guidance/food-retail-industry-challenge-fund-frich.

Dhar, B. 2009. "Use of Green Box Measures by Developing Countries: An Assessment." *In Agricultural Subsidies in the WTO Green Box: Ensuring Coherence with Sustainable Development Goals,* edited by R. Melendez-Ortiz, C. Bellmann, and J. Hepburn, 369–398. International Centre for Trade and Sustainable Development. Cambridge: Cambridge University Press.

Disdier, A.-C., B. Fekadu, C. Murillo, and S. Wong. 2008. *Trade Effects of SPS and TBT Measures on Tropical and Diversification Products. ICTSD Project on Tropical Products*, Issue Paper 12. Geneva: International Centre for Trade and Sustainable Development.

Donovan, K. 2017. "Anytime, Anywhere: Mobile Devices and Services and their Impact on Agriculture and Rural Development." *Module 3 in ICT in Agriculture: Connecting Small holders to Knowledge, Networks, and Institutions*, updated edition, 49–70. Washington, DC: World Bank.

ECA–AU–ADB–UNDP (United Nations Economic Commission for Africa African Union, African Development Bank and United Nations Development Programme). 2014. *MDG 2014 Report: Assessing Progress in Africa toward the Millennium Development Goals. Analysis on the Common African Position on the Post-2015 Development Agenda*. Addis Ababa.

ECDPM (European Centre for Development Policy Management). 2014. Responding to Malabo: *How to Triple Intra-African Agricultural Trade and Promote Inclusive Regional Value Chain Development*? Prepared for ReSAKSS 2014 Conference Side Event, Addis Ababa, 8 October 2014. http://www.resakss.org/2014conference/docs/Side_Event_ECDPM.pdf.

EC (European Commission). 2016a. "Trade: Countries and Regions: West Africa." Accessed August 25, 2016. http://ec.europa.eu/trade/policy/countries-and-regions/regions/west-africa.

_____. 2016b. "Trade: Countries and Regions: East African Community." Accessed August 25, 2016. http://ec.europa.eu/trade/policy/countries-and-regions/regions/eac.

European Union. 2013. *Agribusiness and Development: How Investment in the African Agri-food Sector Can Help Support Development. Seminar co-organised with DG Development and Cooperation EuropeAid, April 10, 2013 Charlemagne, Brussels*. Brussels. http://ec.europa.eu/agriculture/sites/agriculture/files/events/2013/agribusiness-africa/brochure_en.pdf.

Fukase, E., and W. Martin. 2017. *Agro-processing and Horticultural Exports from Africa*. IFPRI Discussion Paper 1690. Washington, DC: International Food Policy Research Institute.

Glauber, J. W. 2015. *Agricultural Insurance and the World Trade Organization*. IFPRI Discussion Paper 1473. Washington, DC: International Food Policy Research Institute.

Haile, B., C. Azzarri, J. Koo, and A. De Pinto. 2017. "Trade, Climate Change, and Climate-Smart Agriculture." *In A Thriving Agricultural Sector in a Changing Climate: Meeting Malabo Declaration Goals through Climate-Smart Agriculture*, ReSAKSS Annual Trends and Outlook Report 2016, edited by A. De Pinto and J. M. Ulimwengu, 54–68. Washington, DC: International Food Policy Research Institute.

Hanks, J., H. Davies, and O. Perera. 2008. *Sustainable Public Procurement in South Africa*. Winnipeg, Canada: International Institute for Sustainable Development.

Hattingh, D., B. Russo, A. Sun-Basorun, and A. van Vamelen. 2012. *The Rise of the African Consumer: A Report from McKinsey's Africa Consumer Insights Center*. New York: McKinsey and Company.

Hollinger, F., and J. Staatz. 2015. *Agricultural Growth in West Africa: Market and Policy Drivers*. Rome: FAO and African Development Bank.

IMF (International Monetary Fund). 2015a. *Global Financial Stability Report: Navigating Monetary Policy Challenges and Managing Risks*. Washington, DC.

_____. 2015b. *Regional Economic Outlook: Sub-Saharan Africa Navigating Headwinds*. World Economic and Financial Surveys. Washington, DC.

IPCC (Intergovernmental Panel on Climate Change). 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*, edited by C. Field, V. Barros, T. Stocker, D. Qin, D. Dokken, K. Ebi, M. Mastrandrea, et al. Cambridge and New York: Cambridge University Press.

Isaac, N. 2017. "Nigeria Prepares for Commercialization of Bt Cowpea, Cotton." Cornell Alliance for Science. October 10, 2017. Accessed July 24, 2018. https://allianceforscience.cornell.edu/blog/2017/10/nigeria-prepares-for-commercialization-of-bt-cowpea-cotton/.

ITC (International Trade Centre). 2015. *International e-Commerce in Africa: The Way Forward*. Geneva.

Jensen, R. 2007. "The digital provide: Information (technology), market performance, and welfare in the South Indian fisheries sector." *The Quarterly Journal of Economics* 122 (3): 879–924.

Juma, C., and K. Gordon. 2014. "Leap-Frogging in African Agriculture: The Case of Genetically Modified Crops." *In Foresight Africa: Top Priorities for the Continent in 2014*. Washington, DC: Brookings Institution.

Karingi, S., S. Mevel, and G. Valensisi. 2015. "The EPAs and Africa's Regional Integration." *Bridges Africa* 4 (6): 14–16.

Karippacheril, T. G., L. Diaz Rios, and L. Srivastava. 2017. "Global Markets, Global Challenges: Improving Food Safety and Traceability While Empowering Smallholders through ICT." *Module 11 in ICT in Agriculture: Connecting Smallholders to Knowledge, Networks, and Institutions*, updated edition, 283–308. Washington, DC: World Bank.

KPMG International. 2013. *The Agricultural and Food Value Chain: Entering a New Era of Cooperation*. London.

Liebert, T. 2012. *Swiss-Ghana Project on Sustainable Public Procurement*. Winnipeg, Canada: International Institute for Sustainable Development.

Maumbe, B. M. 2012. *Emerging ICT Applications in Agribusiness Value Chains: Market Linkages, Food Security and Research Directions*. Presentation prepared for CIIFAD Seminar, Cornell University, Ithaca, NY, October 24, 2012. https://ciifad.cals.cornell.edu/sites/ciifad.cals.cornell.edu/files/shared/documents/MaumbePresentation.pdf.

Mbekeani, K. 2013. *Understanding the Barriers to Regional Trade Integration in Africa*. Background paper for the 2011 G20 Summit in France. Tunis: African Development Bank Group.

Mukhebi, A., J. Kundu, A. Okolla, M. Wambua, W. Ochieng, and G. Fwamba. 2007. "Linking Farmers to Markets through Modern Information and Communication Technologies in Kenya." *In American Association for Agricultural Education Conference Proceedings 2007*.

Munang, R., and J. Andrews. 2014a. "Africa's Trade under a Cloud of Changing Climate." *Africa Renewal* (August). New York: United Nations Department of Public Information.

_____. 2014b. "Can Africa Expand its Trade in the Face of Climate Change?" *Bridges Africa* 3 (9): 19–21.

Muto, M., and T. Yamano. 2009. "The Impact of Mobile Phone Coverage Expansion on Market Participation: Panel Data Evidence from Uganda." *World Development* 37 (12): 1887–1896.

Nijhoff, J. 2009. "Staple Food Trade in the COMESA Region: The Need for a Regional Approach to Stimulate Agricultural Growth and Enhance Food Security." Presented at the 24th Meeting of the Trade and Customs Committee, COMESA, Nairobi, Kenya, November 2–4, 2009. http://purl.umn.edu/62227.

Njehu, F. 2014. "Manoeuvering at the Margins of an EPA Deadlock: Has the EAC Bowed Down to EU Pressure?" *Great Insights Magazine* 3 (9), 24–26.

Odozi, J. C. 2015. "Cross Border Trade in Grain between Nigeria and Neighbouring Niger: Risk Management Assessment along Sokoto Illela-Konni Border Land." *Cogent Economics and Finance* 3: 1029250.

Oduro, A. 2009. "African Countries and the Green Box." *In Agricultural Subsidies in the WTO Green Box: Ensuring Coherence with Sustainable Development Goals*, edited by R. Melendez-Ortiz, C. Bellmann, and J. Hepburn, 412–424. International Centre for Trade and Sustainable Development. Cambridge: Cambridge University Press.

OECD (Organisation for Economic Co-operation and Development), WTO (World Trade Organization), and UNCTAD (United Nations Conference on Trade and Development). 2013. *Implications of Global Value Chains for Trade, Investment, Development and Jobs*. Paper prepared for the G-20 Leaders Summit, Saint Petersburg, September 2013. http://unctad.org/en/PublicationsLibrary/unctad_oecd_wto_2013d1_en.pdf.

Omondi, D. 2016. "Kenyans Made Sh870b Phone Deals in 3 Months." Accessed March 6, 2017. www.standardmedia.co.ke/business/article/2000206357/kenyans-made-sh870b-phone-deals-in-3-months.

PricewaterhouseCoopers. 2016. *AgTech–Don't Wait for the Future, Create It: Africa Agribusiness Insights Survey 2016*. Bloemfontein, South Africa.

Ramdoo, I. 2014. "EPAs: Frequently Asked Questions." *Great Insights Magazine* 3 (9): 40–42.

Reardon, T., D. Tschirley, B. Minten, S. Haggblade, S. Liverpool-Tasie, M. Dolislager, J. Snyder, and C. Ijumba. 2015. "Transformation of African Agrifood Systems in the New Era of Rapid Urbanization and the Emergence of a Middle Class." *In Beyond a Middle Income Africa: Transforming African Economies for Sustained Growth with Rising Employment and Incomes*, edited by O. Badiane and T. Makombe, 62–74. ReSAKSS Annual Trends and Outlook Report 2014. Washington, DC: International Food Policy Research Institute.

Schaeffer, M., F. Baarsch, S. Adams, K. de Bruin, L. de Marez. S. Freitas, A. Hof, et al. 2013. *Africa's Adaptation Gap: Climate Change Impacts, Adaptation Challenges and Costs for Africa*. Technical Report. Geneva: United Nations Environment Programme.

Snyder, J., C. Ijumba, D. Tschirley, and T. Reardon. 2015. *Stages of Transformation in Food Processing and Marketing: Results of an Initial Inventory of Processed Food Products in Dar es Salaam, Arusha, and Mwanza*. Food Security Policy Innovation Lab Tanzania Policy Research Brief 3. Dar es Salaam.

STDF (Standards and Trade Development Facility). 2017. "Topics." Accessed July 19, 2018. http://www.standardsfacility.org/.

Tamiotti, L., R. Teh, V. Kulaçoğlu, A. Olhoff, B. Simmons, and H. Abaza. *Trade and Climate Change*. WTO-UNEP Report. Geneva: World Trade Organization.

Thomas-Greenfield, L. 2015. "AGOA 2015: Moving to Sustainable US-Africa Trade and Investment Partnership." Accessed July 22, 2017. https://agoa.info/news/article/5825-agoa-2015-moving-to-sustainable-us-africa-trade-and-investment-partnership.html.

Toledano, P. 2015. "Global Value Chains and Resource Corridors: The Nexus is Regional Integration." *Great Insights Magazine* 4 (6): 21–23.

Traub, L., F. K. Yeboah, F. Meyer, and T. S. Jayne. 2015. "Megatrends and the Future of African Economies." *In Beyond a Middle Income Africa: Transforming African Economies for Sustained Growth with Rising Employment and Incomes,* edited by O. Badiane and T. Makombe, 38–61. ReSAKSS Annual Trends and Outlook Report 2014. Washington, DC: International Food Policy Research Institute.

Tschirley, D., T. Reardon, M. Dolislager, and J. Snyder. 2015. "The Rise of a Middle Class in East and Southern Africa: Implications for Food System Transformation." *Journal of International Development* 27 (5): 628–646.

UNEP (United Nations Environment Programme). 2013. *Green Economy and Trade: Trends, Challenges, and Opportunities*. Geneva.

_____. *2015. Green Economy: Building Inclusive Green Economies in Africa—Experience and Lessons Learned 2010–2015*. Geneva.

_____. 2016. *Green Economy and Trade Opportunities Project: Synthesis Report*. Geneva.

WEF (World Economic Forum). 2015. *The Africa Competitiveness Report 2015*. Geneva.

Wiebe, K., T. B. Sulser, D. Mason-D'Croz, and M. W. Rosegrant. 2017. "The Effects of Climate Change on Agriculture and Food Security in Africa." *In A Thriving Agricultural Sector in a Changing Climate: Meeting Malabo Declaration Goals through Climate-Smart Agriculture*, ReSAKSS Annual Trends and Outlook Report 2016, edited by A. De Pinto and J. M. Ulimwengu, 5–21. Washington, DC: International Food Policy Research Institute.

Woolfrey, S., and S. Bilal. 2017. *The Impact of Economic Partnership Agreements on the Development of African Value Chains: Case studies of the Kenyan Dairy Value Chain and Namibian Fisheries and Horticulture Value Chains*. Discussion Paper 213. Maastricht: ECDPM.

World Bank. 2008. *Agriculture for Development: World Development Report 2008*. Washington, DC.

_____. 2009. *Information and Communication for Development Report: Extending Reach and Increasing Impact*. Washington, DC.

_____. 2010. *World Development Report 2010: Development and Climate Change*. Washington, DC.

_____. 2012. *Africa Can Help Feed Africa: Removing Barriers to Regional Trade in Food Staples*. Washington, DC.

_____. 2013. *Growing Africa: Unlocking the Potential of Agribusiness*. Washington, DC.

_____. 2015. "Urbanization in Africa: Trends, Promises, and Challenges." Accessed March 6, 2017. www.worldbank.org/en/events/2015/06/01/urbanization-in-africa-trends-promises-and-challenges.

Yushkova, E. 2013. "Impact of ICT on Trade in Different Technology Groups: Analysis and Implications." *International Economics and Economic Policy* 11 (1–2): 165–177.

Zhou, Y., and J. Staatz. 2016. "Projected Demand and Supply for Various Foods in West Africa: Implications for Investments and Food Policy." *Food Policy* 61: 198–212.

7. THE WEST AFRICAN TRADE OUTLOOK: BUSINESS-AS-USUAL COMPARED WITH ALTERNATIVE OPTIONS

Sunday Pierre Odjo and Ousmane Badiane

Recent studies indicate that Africa's global trade performance has strengthened over time (Bouët, Laborde, and Deason 2014), as has its trade performance within Africa, both as a whole and by subregion (Badiane, Makombe, and Bahiigwa 2014). This aligns with the trend of faster demand growth within African and regional export markets compared with the global export market. For instance, Africa's relative share of the global export market rose sharply in terms of value between 1996 and 2013, both for all goods (from 0.05 to 0.21 percent) and for agricultural products (from 0.15 to 0.34 percent). Increased Africa-wide and intra-regional trade, and the rising role of African markets as major destinations for agricultural exports by African countries and regions, suggest that crossborder trade flows will exert greater influence on the level and stability of domestic food supplies.

The more countries find ways to accelerate the pace of trade growth within Africa, the larger that influence is expected to be in the future.

This chapter assesses the future outlook for intra-regional trade expansion in West Africa and the implications for the volatility of regional food markets. The chapter begins with an analysis of historical trends in intra-regional trade of major staple food products, as well as the positions of individual West African countries in the regional market. This is followed by an exploration of the potential of regional trade to contribute to stabilizing food markets, and an assessment of the scope for expanding crossborder trade. The chapter then presents results from a regional trade model used to simulate alternative scenarios for increasing trade and reducing volatility within West Africa's regional market. Finally, conclusions are presented.

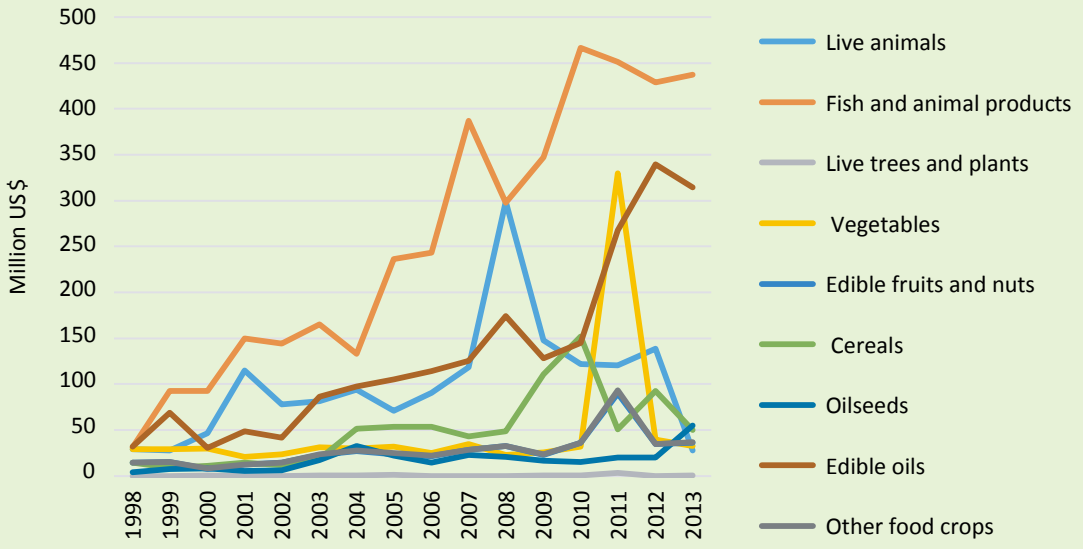
Long-Term Trends in Intra-Regional Trade in Staple Food Products

Between 1998 and 2013, crossborder trade in staple food products followed an increasing but unsteady trend. Fish and animal products, including meat, dairy, and eggs, were the most traded commodities among West African countries in value terms (Figure 7.1; Table 7.1). On average, intra-regional trade of these products amounted to US$439.2 million during 2011–2013, up from only US$165.7 million approximately a decade earlier. The exchange of live animals and edible oils averaged US$95.7 million and US$307.3 million, respectively, during 2011–2013, representing a fourfold growth over average levels in the early 2000s.

The value of trade in cereals and vegetables within West Africa was generally lower. For instance, the regional market for cereals and vegetables averaged US$81.5 million and US$28.5 million, respectively, during 2006–2010. In that period, the region more than doubled its level of trade in cereals in the early 2000s; however, the regional cereals market contracted heavily during 2011–2013. In contrast, trade in vegetables surged in 2011, inflating the average market size to US$133.7 million for the 2011–2013period.

Oilseeds are the least traded product within West Africa in value terms. Crossborder exchange of this commodity amounted to US$31.8 million on average in 2011–2013, almost doubling its value in the early 2000s. Other staple food crops, including edible fruits and nuts and live trees and plants such as roots and tubers, constituted a relatively larger share of the regional market value, amounting to US$54.8 million in 2011–2013, more than double the corresponding value in the early 2000s.

Figure 7.1. Trends in the export of staple food products within West Africa, 1998–2013



Source: Authors' calculations based on HS4-level bilateral trade values from CEPII (2015).

Note: Data include 15 members of the Economic Community of West African States, plus Chad and Mauritania

Table 7.1. Average value of trade of staple food products within West Africa

	2001–2005	2006–2010	2011–2013
Product	US dollars (millions)		
Live animals	87.7	155.6	95.7
Fish and animal products	165.7	348.4	439.2
Vegetables	27.3	28.1	133.7
Cereals	30.1	81.5	64.5
Oilseeds	16.8	17.8	31.8
Edible oils	75.8	137.4	307.3
Other food crops	20.6	28.5	54.8
All staple food products	424.1	797.3	1,127.0

Source: Authors' calculations based on HS4-level bilateral trade values from CEPII (2015).

Note: Data include 15 members of the Economic Community of West African States, plus Chad and Mauritania

In sum, crossborder trade of major food products among West African countries expanded during 2001–2013. The net trade positions of each country by commodity group within the West African regional market are presented in Table 7.2, where negative or positive values indicate net importing or exporting countries and their shares of the total value of net imports and exports for each commodity across the region. For example, Nigeria was the region's largest net importer of live animals in the period under study (50.4 percent), followed by Côte d'Ivoire and Senegal (20.6 and 18.4 percent, respectively). Thus, these major importing countries accounted for 89.4 percent of the regional import market, the remaining 10.6 percent comprising imports by Benin, Ghana, Guinea, Mauritania and Togo. In contrast, Niger (50.5 percent) and Mali (43.2 percent) were the largest regional net exporters of live animals, followed by Burkina Faso (6.2 percent); other countries contributed negligible shares.

Table 7.2. Contributions of individual countries to values of net imports and net exports of staple food products among West African countries, 1998–2013 (%)

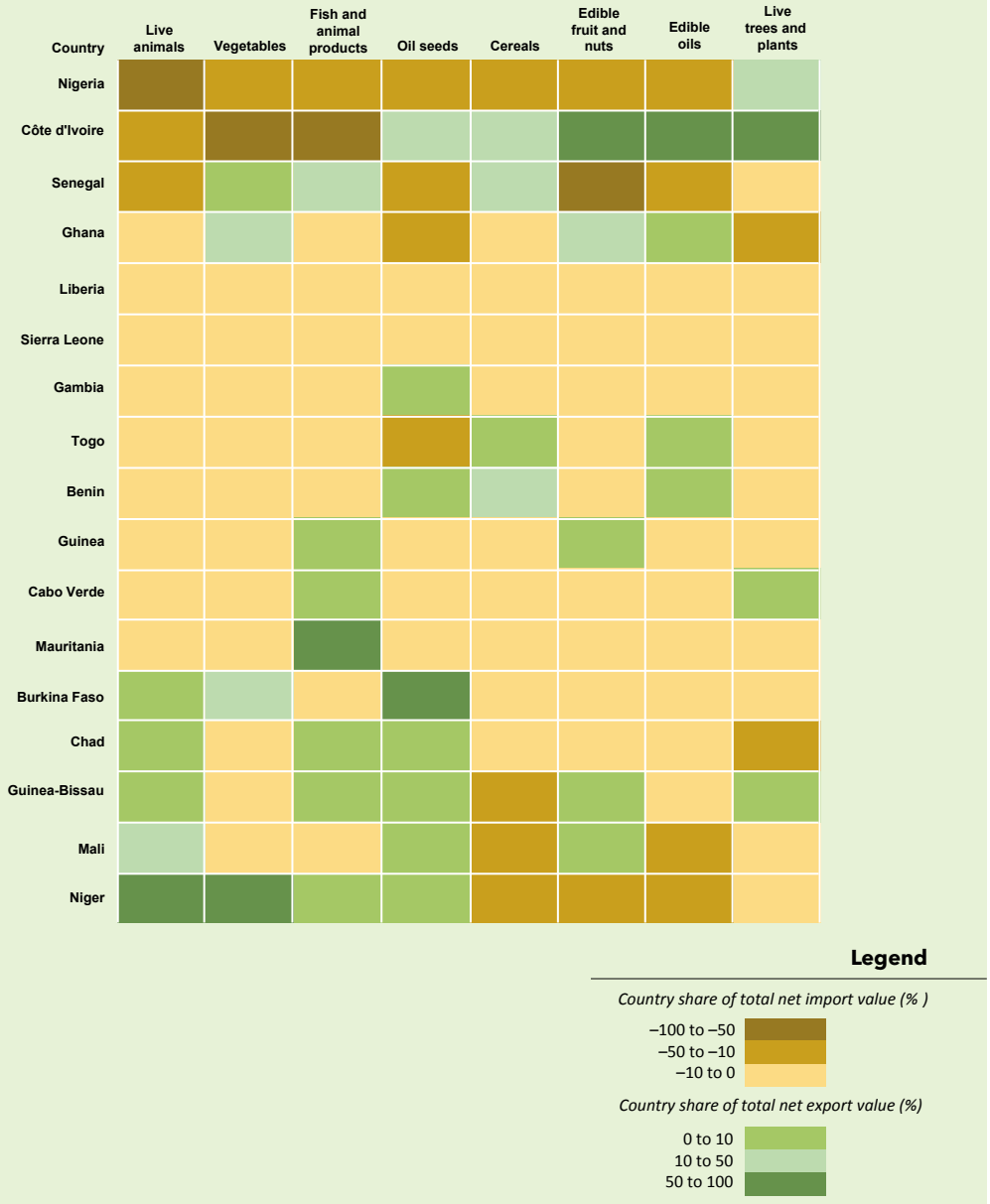
Country	Live animals	Fish and animal products	Live trees and plants	Vegetables	Edible fruit and nuts	Cereals	Oilseeds	Edible oils
	Share (%)							
Benin	–6.1	–1.4	–1.9	–6.4	–6.5	33.8	0.3	8.4
Burkina Faso	6.2	–4.1	–8.8	11.8	–3.7	–1.9	66.5	–7.7
Cabo Verde	0.0	0.2	0.0	–0.1	–0.3	–1.1	0.0	0.0
Chad	0.1	0.4	–32.2	–0.1	–0.7	–0.8	0.0	0.0
Côte d'Ivoire	–20.6	–54.6	52.6	–67.6	78.6	18.3	18.9	88.3
Gambia	0.0	–0.2	–0.3	–0.2	–0.7	–1.6	7.5	–0.2
Ghana	–3.0	–7.2	–37.4	15.2	12.4	–1.9	–45.4	0.7
Guinea	–0.4	8.8	–0.5	–0.1	1.8	–1.4	–1.4	–1.3
Guinea-Bissau	0.0	3.2	0.0	–0.1	0.1	–11.7	0.0	–0.4
Liberia	0.0	–0.4	–5.2	–0.4	–0.1	–0.8	–0.6	–0.4
Mali	43.2	–4.7	–1.4	–3.3	7.2	–21.7	5.1	–21.0
Mauritania	–0.9	71.6	–1.3	–0.3	–7.3	–4.9	–3.7	–0.1
Niger	50.5	0.1	–1.2	71.2	–14.5	–30.0	1.7	–16.7
Nigeria	–50.4	–25.4	47.4	–18.3	–13.4	–22.2	–11.9	–28.6
Senegal	–18.4	15.8	–5.2	1.8	–52.7	39.5	–12.6	–23.6
Sierra Leone	0.0	–0.4	–0.9	–0.5	–0.1	–0.1	–1.5	0.0
Togo	–0.3	–1.5	–3.6	–2.6	0.0	8.3	–22.9	2.6

Source: Authors' calculations based on HS4-level bilateral trade values from CEPII (2015).

Note: Data include 15 members of the Economic Community of West African States, plus Chad and Mauritania.
Positive values indicate net exporting countries' shares of net export values across the region's countries; negative values indicate net importing countries' shares of net import values across the region's countries

These differences are presented visually in Figure 7.2, where major net importers and exporters are clustered at the top and bottom of the figure, and countries with modest market participation are spread in between. Nigeria and Côte d'Ivoire were the largest net importers of vegetables, whereas Niger, Ghana, and Burkina Faso were the largest net exporters. In addition, Nigeria and Côte d'Ivoire were net importers of fish and animal products, whereas net exports were supplied by Mauritania, Senegal, Cabo Verde, and Guinea. The regional oilseeds market was dominated by Ghana, Togo, Senegal, and Nigeria as net importers, and by Burkina Faso, Côte d'Ivoire, Gambia, and Benin as net exporters. Cereals were mostly imported by Niger, Mali, Nigeria, and Guinea-Bissau and exported by Senegal, Benin, and Côte d'Ivoire. Edible fruit and nuts were mainly imported by Senegal, Nigeria, and Niger and exported by Côte d'Ivoire and, to a lesser degree, by Ghana. The regional market of vegetable oils was dominated by Nigeria, Senegal, Mali, and Niger as major net importers and by Côte d'Ivoire as the only major net exporter. Finally, Ghana and Chad dominated the market of live trees and plants as net importers, whereas Côte d'Ivoire and Nigeria were the largest net exporters.

Figure 7.2. Distribution of net exports and net imports of staple food products among West African countries, 1998–2013



Source: Authors' calculations based on HS4-level bilateral trade values from CEPII (2015).

Note: Data include 15 members of the Economic Community of West African States, plus Chad and Mauritania.

In concluding the focus on historical trends in intra-regional trade, it is important to analyze harassment practices, which are perceived as bottlenecks to the free movement of goods (and people) across the region. Survey data on checkpoints, bribes paid, and delays along major crossborder transport corridors in West Africa are summarized in Figure 7.3. The average values plotted illustrate the importance of abnormal trade costs to traders operating within the regional West African market. As of 2010–2012, at least two checkpoints were encountered every 100 kilometers, and a minimum of 2000 West African CFA francs (CFAF) were paid in bribes across the surveyed transport corridors. More than three checkpoints were found along the corridor connecting Bamako (Mali) and Ouagadougou (Burkina Faso), and bribes exceeded CFAF 6000 on average.

Figure 7.3. Indicators of harassment practices along West African transport corridors, 2010–2012

Source: Authors' calculations based on survey results from the Improved Road Transport Governance (IRTG) Initiative (IRTG 2010–2012).

The Regional Potential for Stabilizing Domestic Food Markets through Trade

The variability of domestic production is a major contributor to local food price instability in low-income countries. The causes of production variability mean that an entire region is less likely to be affected than are individual countries. Moreover, fluctuations in national production levels for different countries tend to partially offset each other, such that fluctuations are less than perfectly correlated. As a result, food production can be expected to be more stable at the regional level than at the country level. In this case, expanding crossborder trade and allowing greater integration of domestic food markets would reduce supply volatility and price instability in these markets.

Integrating regional markets through increased trade raises the capacity of domestic markets to absorb local price risks by (1) enlarging the area of production and consumption, thus increasing the volume of demand and supply that can be adjusted to respond to and dampen the effects of shocks; (2) providing incentives to invest in marketing services and expand capacities and activities in the marketing sector, thereby raising the capacity of the private sector to respond to future shocks; and (3) lowering the size of needed carryover stocks, thereby reducing the cost of supplying markets during periods of shortage and hence decreasing the likely amplitude of price variation.

This section presents a simple comparison of the variability of cereal production in individual countries against the regional average to illustrate the potential for trade and local market stabilization through greater market integration (Badiane 1988). For that purpose, a trend-corrected coefficient of variation was used as a measure of production variability at the country and regional levels. Following Cuddy and Della Valle (1978), the trend-corrected coefficient of variation in cereal production was calculated for each member of the Economic Community of West African States (ECOWAS) as follows:

$$TCV_i = CV_i \cdot \sqrt{1 - \overline{R_i^2}}$$

where CV_i is the coefficient of variation in the series of cereal production quantities in country i from 1980 to 2010, and $\overline{R_i^2}$ is the adjusted coefficient of determination of the linear trend model fitted to the series. Next, an index of regional cereal production volatility TCV_{reg} was derived for the ECOWAS region as a weighted average of the trend-corrected coefficients of variation of its member countries with the formula (Koester 1986):

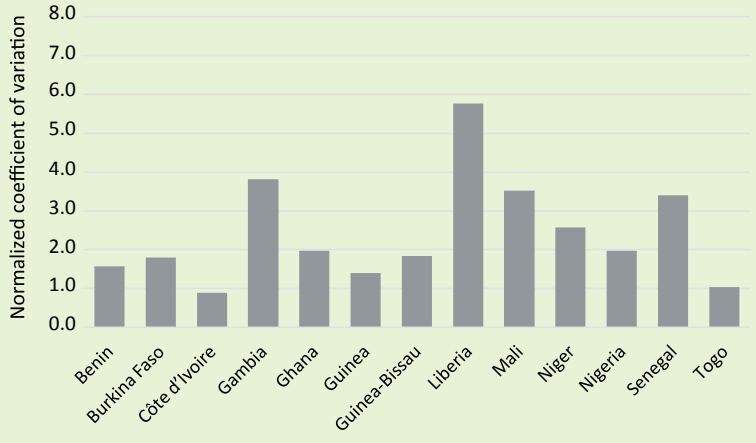
$$TCV_{reg}^2 = \sum_i^n S_i^2 \cdot TCV_i^2 + 2\sum_i^n \sum_j^n S_i \cdot S_j \cdot V_{ij} \cdot TCV_i \cdot TCV_j$$

where TCV_i and TCV_j are the trend-corrected coefficients of variation in cereal production in countries i and j, n is the number of ECOWAS member countries, S_i and S_j are the shares of countries i and j in the region's overall cereal production, and V_{ij} is the coefficient of correlation between the series of cereal production quantities in countries i and j. Finally, the trend-corrected coefficients of variation calculated at the country level were normalized by dividing them by the regional coefficient.

For almost all countries, national production volatility was considerably larger than regional level volatility during 1980–2010, the exception being Côte d'Ivoire (Figure 7.4). Gambia, Liberia, Mali, Niger, and Senegal all recorded considerably higher volatility levels than the region. As a result, these countries would be the biggest beneficiaries of increased regional trade in terms of greater stability of domestic supplies.

However, the likelihood of a given country benefiting from the trade stabilization potential of less volatile regional production also depends on the correlation between the fluctuations in its production and that of other countries in the region: the weaker the relationship, the more likely that regional production will be able to fill national shortfalls.

Figure 7.4. Cereal production instability in ECOWAS countries, 1980–2010



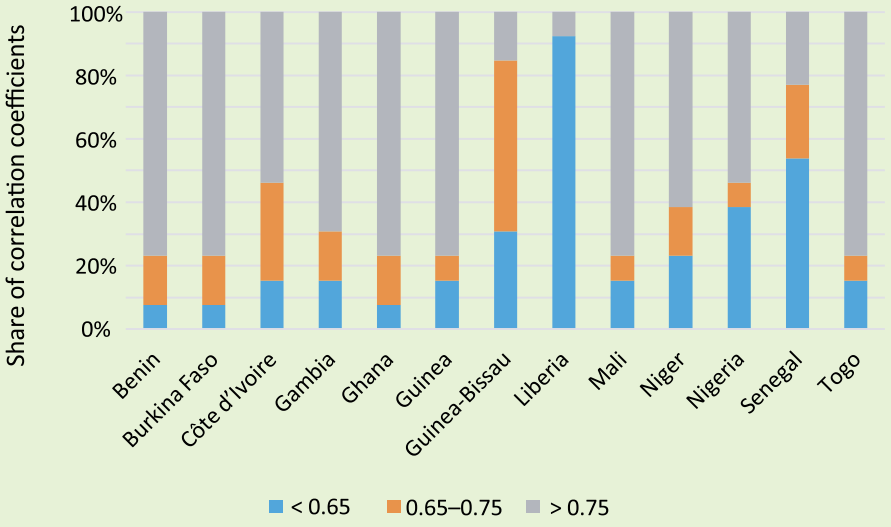
Source: Authors' calculations based on FAO (2014).

Note: The normalized coefficients of variation indicate by how much individual country production levels were more or less volatile (greater or less than 1) than production in the Economic Community of West African States (ECOWAS) region.

Therefore, the distribution of production correlation coefficients between individual countries in the region was plotted (Figure 7.5). For each country, highly correlated production fluctuations are indicated by coefficients of 0.75 or more, moderately correlated country production fluctuations are indicated by coefficients between 0.65 and 0.75, and weakly correlated production fluctuations are indicated by coefficients of 0.65 or less. Country production levels tend to fluctuate together, as shown by the high share of coefficients above 0.75 for the majority of countries.

However, the share is less than 30 percent for some countries, including Guinea-Bissau, Liberia, and Senegal. The division of the region into two nearly uniform subregions (Sahelian and coastal) may explain this. In general, the patterns and distribution of production fluctuations across the region's countries are such that increased trade could be expected to contribute to stabilizing domestic agricultural and food markets. That is only one condition, however. The other is the actual potential to increase crossborder trade, which is examined in the next section.

Figure 7.5. Distribution of production correlation coefficients among ECOWAS countries, 1980–2010



Source: Authors' calculations based on FAO (2014).

The Scope for Specialization and Expanding Regional Trade in Agriculture

Despite the recent upward trends, the level of intra-African and intra-regional trade is still very low compared with other regions. Intra-African markets accounted only for an average of 34 percent of all agricultural exports from African countries between 2007 and 2011 (Badiane, Makombe, and Bahiigwa 2014). A host of factors may be behind these low levels of intra-regional trade, not only making trading with extra-regional partners more attractive, but also raising the cost of supplying regional markets from intra-regional sources. The exploitation of the stabilization potential of regional trade, as described above, would require measures to lower the barriers to and bias against transborder trade so as to stimulate the expansion of regional supply capacities and of trade flows across borders. This assumes that sufficient scope exists for specialization in production and trade within the region. It is often assumed that neighboring developing countries would exhibit similar production and trading patterns because of the similarities in their resource bases, which would leave little room for future specialization.

Several factors, however, may cause different specialization patterns among such countries, including (1) differences in historical technological investments and thus the level and struc-

ture of accumulated production capacities and skills; (2) the economic distance to, and opportunity to trade with, distant markets; and (3) differences in dietary patterns and consumer preferences that affect the structure of local production. The different patterns of specialization in Senegal compared with the rest of Sahelian West Africa and in Kenya compared with other Eastern African countries illustrate the influence of these factors.

Consequently, a series of indicators was used to assess the actual degree of specialization in agricultural production and trade, and whether real scope exists to expand transborder trade as a strategy to exploit the less-than-perfect correlation among national production levels to reduce the vulnerability of domestic food markets to shocks. The first two indicators are the production and export similarity indexes, which measure and rank the relative importance of the production and trading of individual agricultural products in each country. These two indexes were calculated for country pairs using the following formulas:

$$SQ_{ij} = 100 \sum_k Min(q_{ik}, q_{jk})$$

and

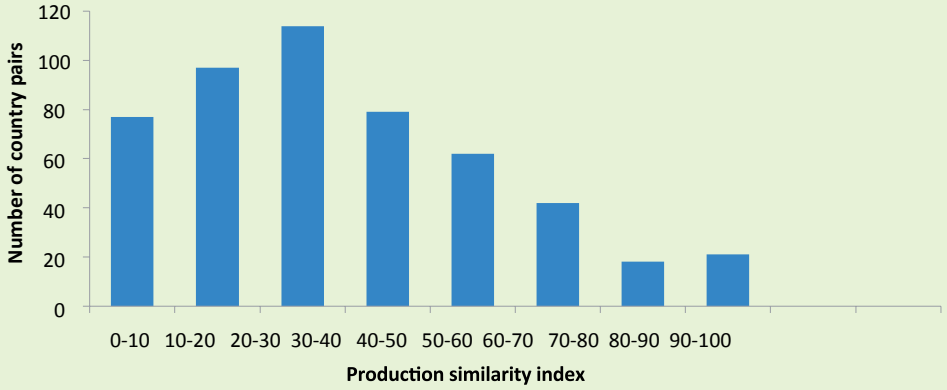
$$SE_{ij} = 100 \sum_k Min(e_{ik}, e_{jk})$$

where SQ_{ij} and SE_{ij} are the production and export similarity indexes, respectively; q_{ik} and q_{jk} are the shares of a product k in the total agricultural production of countries i and j, respectively; and e_{ik} and e_{jk} are the shares of a product k in the total agricultural exports of countries i and j, respectively. The level of importance or position of each product was then compared for all relevant pairs of countries within the region.[20] The indexes have a maximum value of 100, reflecting complete similarity of production or trade patterns between the considered pair of countries.

The more the value of the indexes tends toward zero, the greater the degree of specialization between the two countries. The results of the calculations cover 150 products in total (Figures 6.6 and 6.7).

The vast majority of country pairs fall within the 0–50 range. A value of less than 60 is conventionally interpreted as compatible with higher trade exchange between the considered pair of countries. The estimated index values therefore suggest sufficient dissimilarity in current country production and trading patterns exists such that there is scope for transborder trade expansion in the region.

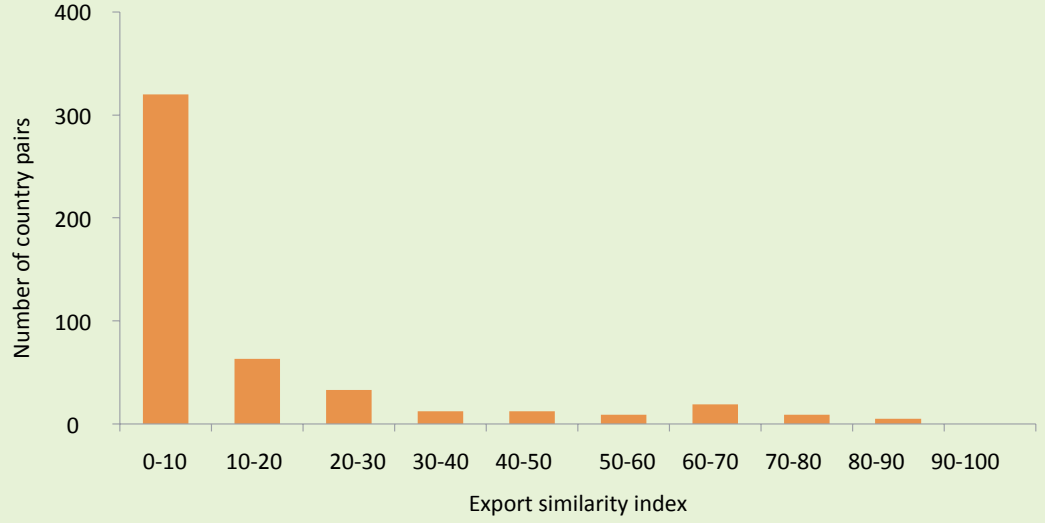
Figure 7.6. Similarity of production patterns among ECOWAS countries, 2007–2011



Source: Authors' calculations based on data from FAO (2014).

Note: Each bar represents the number of country pairs that fall within the corresponding range of index values

Figure 7.7. Similarity of trading patterns among ECOWAS countries, 2007–2011



Source: Authors' calculations based on FAO (2014).

A third indicator, the revealed comparative advantage (RCA) index, was computed to further assess the degree of trade specialization among countries within the region. This index was calculated according to the following formula (Balassa 1965):

$$RCA_{ijk} = \frac{E_{ijk}}{\sum_k E_{ijk}} \Big/ \frac{E_{wjk}}{\sum_k E_{wjk}}$$

where E_{ijk} is the export value of an agricultural product k from country i to destination j, and $E_{wjk} = \sum_i E_{ijk}$ is the world export value of the same product to the same destination.

The RCA index compares the share of a given product in a given country's export basket with that of the same product in total world exports. A value greater than 1 indicates that the considered country performs better than the world average.

The higher the value, the stronger the performance of the country in exporting the considered product. Of the nearly 450 RCA indicators estimated for various products exported by different ECOWAS countries, 73 percent recorded a value higher than 1. Following Laursen (2000), the RCA index is normalized through the formula

$$NRCA_{ijk} = (RCA_{ijk} - 1) / (RCA_{ijk} + 1)$$

Thus, the normalized RCA (NRCA is positive for RCA indicators that are greater than 1 and negative otherwise. For very high RCA indicators, the normalized value tends towards 1. The 20 products with the highest normalized RCA index values are presented in Table 7.3. All the products in the table have normalized RCA values above 0.98. The rankings reflect the degree of cross-country specialization within the ECOWAS region. For instance, 12 products spread across 8 of the 15 member countries account for the region's highest 20 normalized RCA indicator values.

Table 7.3. The top-20 products with the highest normalized comparative advantage index values in ECOWAS countries, 2007–2011 average

Commodity	Country
Cashew nuts, with shell	Guinea-Bissau
Cake of groundnuts	Gambia
Groundnut oil	Gambia
Cashew nuts, with shell	Benin
Groundnuts, shelled	Gambia
Cashew nuts, with shell	Gambia
Groundnut oil	Senegal
Copra	Gambia
Cake of groundnuts	Senegal
Cake of cottonseed	Benin
Rubber, natural dry	Liberia
Cottonseed oil	Togo
Cottonseed oil	Benin
Sugar beet	Gambia
Cashew nuts, with shell	Côte d'Ivoire
Cotton Linter	Benin
Cocoa beans	Côte d'Ivoire
Cake of groundnuts	Togo
Cocoa paste	Côte d'Ivoire
Cocoa beans	Ghana

Source: Authors' calculations based on FAO (2014).

So far, the analysis has established the existence of dissimilar patterns of specialization in production and trade of agricultural products among ECOWAS countries. Two final indicators, the trade overlap indicator (TOI) and trade expansion indicator (TEI), were calculated to examine the potential to expand trade within the region based on current trade patterns. These indicators measure how much of the same product a given country or region exports and imports at the same time. The TOI measures the overall degree of overlapping trade flows for a country or region as a whole, while the TEI measures the overlapping trade flows at the level of individual products for a country or region.

The TOI and TEI are calculated as follows :

$$TOI_i = 2\left(\sum_k Min(E_{ik}, M_{ik})\right) / \sum_k (E_{ik} + M_{ik})$$

$$TEI_{ik} = 100 \cdot \left[Min(E_{ik}, M_{ik}) / Max(E_{ik}, M_{ik})\right],$$

where E_{ik} and M_{ik} denote the values of the exports and imports of an agricultural product k by a country i. The TOI varies between 0 and 1 and will be 0 if the country only exports or imports any individual products. It will be 1 in the unlikely situation in which the country both exports and imports all traded products by an equal amount.

The TEI indicates the percentage of the country's exports (imports) of a product that are matched by the country's imports (exports) of the same product (Figure 7.8 and Table 7.4). The figure indicates a considerable degree of overlapping trade flows: 25 percent for Africa as a whole and as much as 17 percent for the ECOWAS region. Normalized TOI values obtained by dividing country TOI values by the TOI value for the region can be found in Badiane, Makombe, and Bahiigwa (2014). In the vast majority of cases, they are significantly less than 1. The overlapping regional trade flows must therefore be from different importing and exporting countries. In other words, some countries are exporting (importing) the same products that are being imported (exported) by other ECOWAS member countries, but–in both cases–to and from countries outside the region. By redirecting such flows, countries should be able to expand transborder trade within the region.

The TEI indicates which products have the highest potential for increased transborder trade based on the degree of overlapping trade flows. The 20 products with the highest TEI value for the region are listed in Table 7.4. The lowest indicator value for any of the products is 0.41, and the average value is 0.56. RCA values for the same products, presented in Badiane, Makombe, and Bahiigwa (2014), are all greater than 1, except for fresh fruit. The fact that products with high TEI values also have high RCA values points to real scope for transborder trade expansion in the region.

Figure 7.8. Trade overlap indicators for the ECOWAS region, 2007–2011

Source: Authors' calculations based on FAO (2014).

Table 7.4. Trade expansion indicators for the ECOWAS region, 2007–2011 average

Commodity	TEI value
Tobacco products	0.926
Fatty acids	0.763
Groundnuts, shelled	0.744
Hides, cattle, wet salted	0.681
Coffee, extracts	0.676
Fruit, fresh	0.62
Fruit, tropical fresh	0.592
Cigarettes	0.573
Tea, mate extracts	0.535
Oilseeds	0.524
Onions, dry	0.513
Oil, cottonseed	0.51

Table 7.4. (Continued)

Commodity	TEI value
Pepper	0.479
Margarine	0.456
Roots and tubers	0.454
Cereal preparations	0.439
Chickpeas	0.415
Vegetables, fresh or dried products	0.412
Fruit, prepared	0.412
Pineapple, canned	0.406

Source: Authors' calculations based on FAO (2014).

Note: Italics designate products with an RCA value of less than 1; six products with high TEI values that are not produced in the region are included because they relate to re-export trade.

The findings presented above point to the existence of a real potential to expand intra-regional trade within ECOWAS beyond its current levels, even with current production and trade patterns. The remainder of the chapter therefore analyzes the outlook for expanding intra-regional trade and the expected impact on the volatility of regional food markets from 2008 to 2025. This is done by simulating alternative policy scenarios to boost intra-regional trade, comparing the effects on the level and volatility of trade flows against historical trends and outcomes under a baseline scenario that would continue those trends.

Regional Trade Simulation Model

The preceding analysis presented evidence showing that ECOWAS countries could use increased regional trade to enhance the resilience of domestic markets to supply shocks. The high cost of moving goods across domestic and transborder markets and outwardly biased trading infrastructure are major determinants of the level and direction of trade among African countries. A strategy to exploit the regional stabilization potential must, therefore, include measures to lower the general cost of trading and remove additional barriers to crossborder trade. This section simulates the impact on regional trade flows of changes in that direction. Simulations of changes are carried out using the regional Economywide Multimarket Model of the International Food Policy Research Institute (IFPRI) described below (see Diao et al. 2007 and Nin-Pratt et al. 2010). The original model has been augmented in this study to account for intra-versus extra-regional trade sources and destinations, as well as informal versus formal trade costs in intra-regional trade transactions. In its original version, the model solves for optimal levels of supply QX_{rc}, demand QD_{rc} and net trade (either imports QM_{rc} or exports QE_{rc}) of different commodities c for individual member countries r of the modeled region.

Supply and demand balance at the national level determines domestic output prices PX_{rc} as stated by equation (1), while equation (2) connects domestic market prices PD_{rc} to domestic output prices, taking into account an exogenous domestic marketing margin $margD_{rc}$. The net trade of a commodity in a country is determined through mixed complementarity relationships between producer prices and potential export quantities, and between consumer prices and potential import quantities. Accordingly, equation (3) ensures that a country will not export a commodity $(QE_{rc} = 0)$ as long as the producer price of that commodity is higher than its export parity price, where pwe_{rc} is the country's free on board (FOB) price and $margW_{rc}$ is an exogenous trade margin covering the cost of moving the commodity from and to the border.

If the domestic market balance constraint in equation (1) requires that the country exports some excess supply of a commodity ($QE_{rc} > 0$), then the producer price will be equal to the export parity price of that commodity. Additionally, equation (4) governs any country's possibility to import a commodity, where pwm_{rc} is its cost, insurance, and freight (CIF) price. There will be no imports ($QM_{rc} = 0$) as long as the import parity price of a commodity is higher than the domestic consumer price. If the domestic market balance constraint requires that the country imports some excess demand of a commodity ($QM_{rc} > 0$), then the domestic consumer price will be equal to the import parity price of that commodity.

$$QX_{rc} + QM_{rc} - QE_{rc} = QD_{rc} \quad (1)$$

$$PX_{rc} \cdot (1 + margD_{rc}) = PD_{rc} \quad (2)$$

$$PX_{rc} \geq pwe_{rc} \cdot (1 - margW_{rc}) \perp QE_{rc} \geq 0 \quad (3)$$

$$pwm_{rc} \cdot (1 + margW_{rc}) \geq PD_{rc} \perp QM_{rc} \geq 0 \quad (4)$$

In the version of the model used in this study, the net export of any commodity is an aggregate of two output varieties differentiated according to their (regional and extra-regional) market outlets, assuming an imperfect transformability between the two export varieties. Similarly, the net import of any commodity is modeled as a composite of two varieties differentiated by their (regional and extra-regional) origins, assuming an imperfect substitutability between the two import varieties.

In order to implement export differentiation by destination, the mixed complementarity relationship in equation (3) is replaced with two new equations that specify the price conditions for export to be possible to both destinations. Equation (5) indicates that, for export to extra-regional market outlets to be possible ($QEZ_{rc} > 0$), suppliers should be willing to accept a price for that destination, PEZ_{rc} , that is not greater than the export parity price. Similarly, equation (6) assures that export to within-region market outlets is possible ($QER_{rc} > 0$) only if suppliers are willing to receive a price for that destination, PER_{rc} , that is not more than the regional market clearing price, PR_c , adjusted downward to account for exogenous regional trade margins, $margR_{rc}$, incurred in moving the commodity from the farm gate to the regional market (see equation 17 below for the determination of PR_c).

$$PEZ_{rc} \geq pwe_{rc} \cdot (1 - margW_{rc}) \perp QEZ_{rc} \geq 0 \quad (5)$$

$$PER_{rc} \geq PR_c \cdot (1 - margR_{rc}) \perp QER_{rc} \geq 0 \quad (6)$$

Subject to these price conditions, equations (7) through (10) determine the aggregate export quantity and its optimal allocation to alternative destinations. Equation (7) indicates that the aggregate export of a commodity by individual countries, QE_{rc} , is obtained through a constant elasticity of transformation (CET) function of the quantity QEZ_{rc} sold on extra-regional market outlets and the quantity QER_{rc} sold on intra-regional market outlets, where ρ^e_{rc} , δ^e_{rc} , and α^e_{rc} represent the CET function exponent, share parameter, and shift parameter, respectively. Equation (8) is the first-order condition of the aggregate export revenue maximization problem, given the prices suppliers can receive for the different export destinations and subject to the CET export aggregation function.

It says that an increase in the ratio of intra-regional to extra-regional destination prices will increase the ratio of intra-regional to extra-regional export quantities—that is, a shift toward the export destination that offers the higher return. Equation (9) helps identify the optimal quantities supplied to each destination. It states that aggregate export revenue at producer price of exports, PE_{rc} is the sum of export sales revenues from both intra- and extra-regional market outlets at supplier prices, whereas equation (10) sets the producer price of exports to be the same as the domestic output price PX_{rc}, which is determined through the supply and demand balance equation (1) as previously explained.

$$QE_{rc} = \alpha^{e}_{rc} \cdot \left(\delta^{e}_{rc} \cdot QER^{\rho^{e}_{rc}}_{rc} + (1 - \delta^{e}_{rc}) \cdot QEZ^{\rho^{e}_{rc}}_{rc} \right)^{\frac{1}{\rho^{e}_{rc}}} \quad (7)$$

$$\frac{QER_{rc}}{QEZ_{rc}} = \left(\frac{PER_{rc}}{PEZ_{rc}} \cdot \frac{1 - \delta^{e}_{rc}}{\delta^{e}_{rc}} \right)^{\frac{1}{\rho^{e}_{rc} - 1}} \quad (8)$$

$$PE_{rc} \cdot QE_{rc} = PER_{rc} \cdot QER_{rc} + PEZ_{rc} \cdot QEZ_{rc} \quad (9)$$

$$PE_{rc} = PX_{rc} \quad (10)$$

Import differentiation by origin is implemented following the same treatment as described above for export differentiation by destination. Equation (4) is replaced with equations (11) and (12). Accordingly, import from the extra-regional origin will occur ($QMZ_{r,c} > 0$) only if domestic consumers are willing to pay for the extra-regional variety at a price, PMZ_{rc}, that is not smaller than the import parity price. Furthermore, import from the intra-regional origin is possible ($QMR_{rc} > 0$) only if domestic consumers are willing to pay for the intra-regional variety at a price, PMR_{rc}, that is not smaller than the regional market clearing price, PR_{c}, adjusted upward to account for exogenous regional trade margins, $margR_{rc}$, incurred in moving the commodity from the regional market to consumers.

$$pwm_{rc} \cdot (1 + margW_{rc}) \geq PMZ_{rc} \perp QMZ_{r,c} \geq 0 \quad (11)$$

$$PR_{r} \cdot (1 + margR_{rc}) \geq PMR_{rc} \perp QMR_{rc} \geq 0 \quad (12)$$

Under these price conditions, equation (13) represents an aggregate import quantity, QM_{rc}, as a composite of intra- and extra-regional import variety quantities, QMR_{rc} and $QMZ_{r,c}$, respectively, using a constant elasticity of substitution (CES) function, with ρ^{m}_{rc}, δ^{m}_{rc}, and α^{m}_{rc} representing the CES function exponent, share parameter, and shift parameter, respectively. The optimal mix of the two varieties is defined by equation (14), which is the first-order condition of the aggregate import cost-minimization problem, subject to the CES aggregation equation (13) and given import prices from both origins. An increase in the ratio of extra- to intra-regional import prices increases the ratio of intra- to extra-regional import quantities—that is, it effects a shift away from the import origin that becomes more expensive. Equation (15) identifies the specific quantities imported from each origin. It defines the total import cost at the consumer price of imports PM_{rc} as the sum of intra-regional and extra-regional import costs, while equation (16) sets the consumer price of imports to be the same as the domestic market price PD_{rc}, which is determined through equations (1) and (2) as previously explained.

$$QM_{rc} = \alpha^{m}_{rc} \cdot \left(\delta^{m}_{rc} \cdot QMR^{-\rho^{m}_{rc}}_{rc} + (1 - \delta^{m}_{rc}) \cdot QMZ^{-\rho^{m}_{rc}}_{rc} \right)^{\frac{1}{\rho^{m}_{rc}}} \quad (13)$$

$$\frac{QMR_{rc}}{QMZ_{rc}} = \left(\frac{PMZ_{rc}}{PMR_{rc}} \cdot \frac{\delta^m_{rc}}{1-\delta^m_{rc}}\right)^{\frac{1}{1+\rho^m_{rc}}} \quad (14)$$

$$PM_{rc} \cdot QM_{rc} = PMR_{rc} \cdot QMR_{rc} + PMZ_{rc} \cdot QMZ_{rc} \quad (15)$$

$$PM_{rc} = PD_{rc} \quad (16)$$

Having determined export quantities and prices by destination and import quantities and prices by origin, the regional market clearing price, PR_c, can now be solved. Equation (17) imposes the regional market balance constraint by equating the sum of intra-regional export supplies to the sum of intra-regional import demands, with $qdstk_c$ standing for discrepancies existing in observed aggregate intra-regional export and import quantity data in the model's base year. Thus, PR_c is determined as the price that ensures the regional market balance:

$$\sum_r QER_{rc} = \sum_r QMR_{rc} + qdstk_c \quad (17)$$

Calibration is performed so as to replicate, for every member country within the region, the same production, consumption, and net trade data observed for different agricultural subsectors and two nonagricultural subsectors in 2007–2008. Baseline trend scenarios are then constructed such that, until 2025, changes in crop yields, cultivated areas, outputs, and GDP reflect the same observed changes. Although the model is calibrated to the state of national economies seven years earlier, it closely reproduces the countries' current growth performance.

Four different scenarios are simulated using the model. The first is the baseline scenario described above, which assumes a continuation of current trends to 2025 and is used as a reference to evaluate the impact of changes under the remaining three scenarios. These other scenarios introduce three different sets of changes to examine their impacts on regional trade levels:

1. A 10 percent reduction in the overall cost of trading across the economy;
2. Removal of all harassment costs (that is, a reduction of their tariff equivalent to zero); and
3. A 10 percent increase in yields across the board.

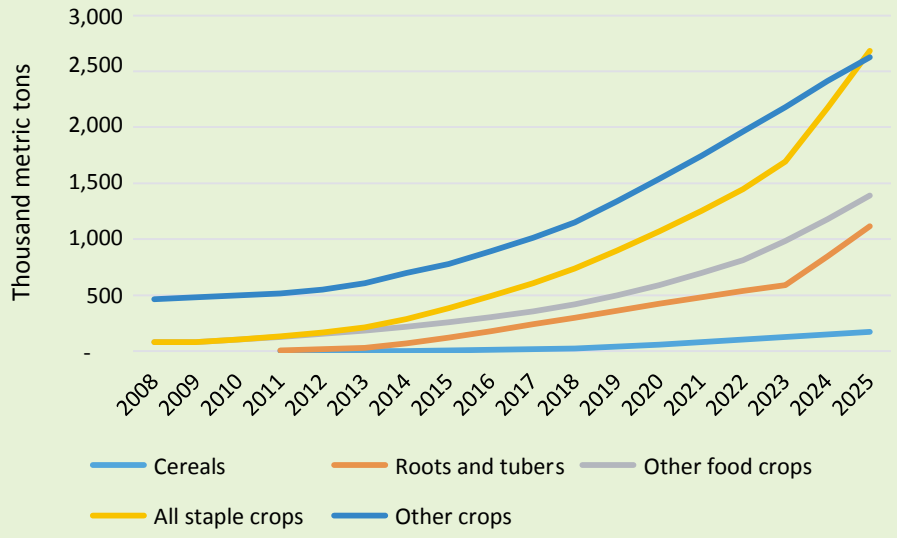
These changes occur between 2008 (the base year) and 2025. The change in crossborder exports is used as an indicator of the impact on intra-regional trade. In the original data, large discrepancies exist between recorded regional export and import levels, with import levels often being a multiple of export levels. The more conservative export figures are therefore the preferred indicator of intra-regional trade.

Simulation Results for Intra-Regional Trade

Assuming a continuation of current trends, intra-regional trade in ECOWAS is expected to expand rapidly, but with marked differences across crops (Figure 7.9). The aggregate volume of intra-regional trade in staples approaches 3 million tons under a scenario where the current rates of growth in yields, cultivated areas, population, and income are sustained to 2025. Cereals undergo the smallest gains, whereas trade in roots and tubers and other food crops undergo much faster growth.

This is in line with the current structure of and trends in commodity demand and trade. While the increase in demand for roots and tubers is being met almost exclusively from local sources, the fast-growing demand in cereals is heavily tilted toward rice, which is supplied from outside of the region. The two leading cereals that are traded regionally, maize and millet, therefore benefit less from the expansion of regional demand and have historically seen slower growth in trade than roots and tubers.

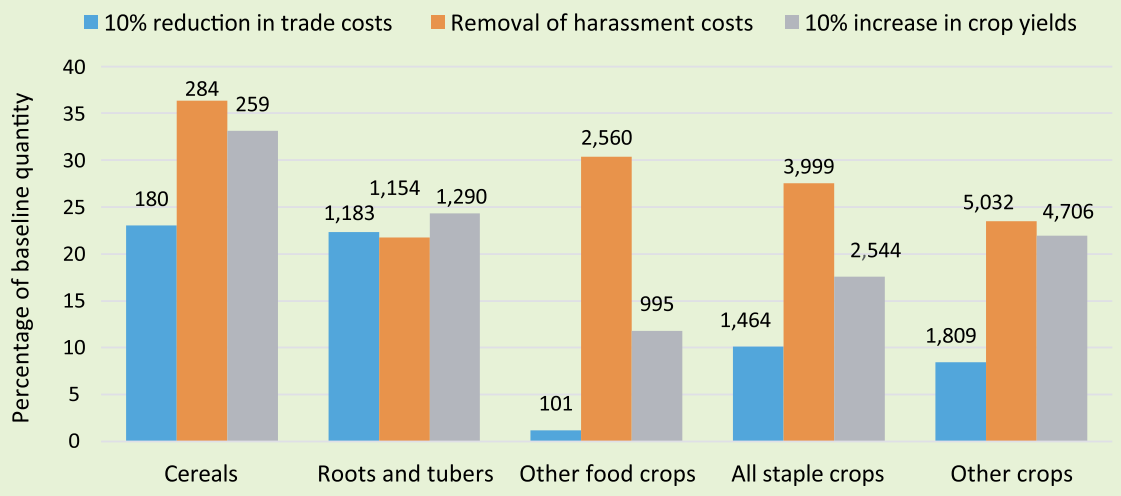
Figure 7.9. Baseline crossborder export projections for the ECOWAS region, 2008–2025



Source: Authors' calculations based on Regional Economywide Multimarket Model simulation results.

The cumulative changes in intra-regional export levels by 2025 were compared against baseline levels to determine what would result from a reduction in total trading costs, removal of harassment costs, and an increase in yields (Figure 7.10). The results invariably show considerable increases in intra-regional trade in cereals and roots and tubers, the main food crops, in response to changes in trading costs and yields. Intra-community trade levels in ECOWAS climb by between 10 and 35 percent for most products over the entire period. The volume of cereal trade increases by a cumulative total of between 200,000 and 300,000 tons for individual products, and that of overall trade in staples by between 1.5 and 4.0 million tons by 2025, compared with baseline trends. In general, cereals seem to respond better than other products. It also appears that removing harassment costs has the strongest impact on trade flows across the board. Countries respond more significantly to the removal of harassment costs than to the reduction of normal trade costs, except for Benin, Guinea-Bissau, Niger, and Sierra Leone, which appear to be more responsive to increases in crop yields than to reductions in normal trading costs or harassment costs (Table 7.5).

Figure 7.10. The impact of changes in trade costs and yields on crossborder exports within the ECOWAS region



Source: Authors' calculations based on Regional Economywide Multimarket Model simulation results.

Note: The bars represent the percentage changes, whereas the values on top of the bars indicate the corresponding absolute changes in thousand metric tons.

Table 7.5. Country-level impact of changes in trade costs and yields on regional exports of staple food crops

	10 percent reduction in trade costs	Removal of harassment costs	10 percent increase in crop yields
Benin	27.6	18.2	39.5
Burkina Faso	22.2	34.9	39.1
Chad	22.5	39.1	33.9
Côte d'Ivoire	8.9	17.7	14.2
Gambia	1.9	8.5	5.3
Ghana	5.7	24.1	15.5
Guinea	4.7	32.0	16.2
Guinea-Bissau	51.1	37.1	91.5
Liberia	9.0	34.2	22.1
Mali	4.6	21.6	10.5
Mauritania	17.5	33.2	28.6
Niger	80.8	1.4	289.6
Nigeria	26.0	32.9	46.3
Senegal	10.6	32.6	25.3
Sierra Leone	93.4	40.3	117.6
Togo	6.6	32.1	21.1

Source: Authors' calculations based on Regional Economywide Multimarket Model simulation results.

Regional Market Volatility under Alternative Policy Scenarios

Under each scenario, the model's simulated quantities of intra-regional exports, QER_{rc}, are used to estimate an index of future export volatility at country and regional levels as follows. First, a trend-corrected coefficient of variation, TCV, is calculated for each country:

$$TCV_i = CV_i \cdot \sqrt{1 - \overline{R_i^2}}$$

where CV_i is the coefficient of variation in the series of the intraregional exports of staple food crops by a country i from 2008 to 2025, and $\overline{R_i^2}$ is the adjusted coefficient of determination of the linear trend model fitted to the series.

Then an index of regional volatility, TCV_{reg}, is derived for the ECOWAS region as a weighted average of trend-corrected coefficients of variation for its member countries with the formula.

$$TCV_{rec}^2 = \sum_i^n S_i^2 \cdot TCV_i^2 + 2\sum_i^n \sum_i^n S_i \cdot S_j \cdot V_{ij} \cdot TCV_i \cdot TCV_j$$

where TCV_i and TCV_j are the trend-corrected coefficients of variation in the export of staple food crops in countries i and j, n is the number of ECOWAS member countries, s_i and s_j are the shares of countries i and j in the region's overall intra-regional exports of staple food crops, and v_{ij} is the coefficient of correlation between the food crop exports of countries i and j. Finally, the coefficients of variation at the country level are normalized by dividing them by the regional coefficient. The historical and simulated levels of volatility of crossborder trade in food staples in the region under historical trends and each of the alternative scenarios are reported in Table 7.6. Volatility levels under historical trends are calculated based on bilateral export volumes from the TradeMaps database (1996–2012). Simulated volatility levels under the various scenarios are compared with the historical levels of volatility, with the difference expressed in point changes (Table 7.7). As can be seen from the figures in the two tables, regional crossborder trade volatility decreases with a reduction of overall trading costs but rises under the removal of crossborder trade barriers or with increases in yields. The magnitude of the changes are, however, rather small across all three scenarios. The results also show that under the continuation of current trends of rising volumes of intra-regional trade, the volatility level in the region is expected to decline compared with historical trends.

Table 7.6. Volatility in crossborder exports of staple food products within the ECOWAS region

Country	Historical trend, 1996–2012	Baseline trend, 2008–2025	10 percent reduction in trade costs, 2008–2025	Removal of harassment costs, 2008–2025	10 percent increase in crop yields, 2008–2025
Benin	1.753	0.703	0.629	0.660	0.618
Burkina Faso	1.269	1.566	1.353	1.643	1.539
Cabo Verde	2.802				
Côte d'Ivoire	0.285	0.657	0.531	0.631	0.591
Gambia		1.585	1.546	1.379	1.291
Ghana	2.145	0.214	0.191	0.135	0.126
Guinea	1.347	0.538	0.540	0.698	0.654
Guinea-Bissau		2.101	2.188	2.156	2.020
Liberia		0.521	0.520	0.656	0.615
Mali	0.856	1.107	1.138	1.164	1.090
Niger	2.011	1.913	2.004	1.785	1.672
Senegal	0.926	0.029	0.048	0.166	0.155
Sierra Leone		2.741	3.407	2.667	2.499
Togo	0.863	1.492	1.574	1.641	1.538
ECOWAS region	0.345	0.330	0.323	0.354	0.378

Source: Authors' calculations based on ITC (2016) and Regional Economywide Multimarket Model simulation results.

Table 7.7. Change in trade volatility under alternative scenarios, 2008–2025

Country	Baseline trend, 2008–2025	10 percent reduction in trade costs	Removal of harassment costs	10 percent increase in crop yields
	Point change compared with historical trend			
Benin	–1.050	–1.124	–1.093	–1.135
Burkina Faso	0.297	0.084	0.374	0.270
Côte d'Ivoire	0.372	0.246	0.346	0.307
Ghana	–1.931	–1.954	–2.010	–2.019
Guinea	–0.809	–0.807	–0.649	–0.693
Mali	0.251	0.282	0.307	0.234
Niger	–0.098	–0.007	–0.226	–0.339
Senegal	–0.897	–0.878	–0.760	–0.770
Togo	0.629	0.711	0.779	0.675
ECOWAS region	–0.015	–0.022	0.009	0.033

Source: Authors' calculations based on ITC (2016) and Regional Economywide Multimarket Model simulation results.

A better comparison, therefore, is to contrast changes under the two trade policy scenarios and the productivity scenario with expected volatility levels under the baseline scenario. Furthermore, the direction and magnitude of changes in the level of intra-regional trade volatility are determined by the combined effect of changes in the level of volatility, as well as the shares of crossborder exports by individual countries (Figure 7.11).

The dots in the figure indicate the position of different countries under the three scenarios. The tilted distribution of country positions to the left of the x-axis indicates that exports by most countries would experience a lower level of volatility under regional policies that would reduce the overall cost of trading, eliminate harassment costs by dismantling administrative and regulatory obstacles to transborder trade, or raise yields of staple crops in member countries.

Figure 7.11. Changes in national export shares and volatility among ECOWAS member countries compared with baseline trends

Source: Authors' calculations based on ITC (2016) and Regional Economywide Multimarket Model simulation results.

Changes in country production patterns resulting from the simulated policy actions lead to changes in both the volatility and export levels, hence the shares in regional trade for each country (Table 7.8). The magnitude and direction of these changes determine the contribution of individual countries to changes in the level of volatility in regional food markets.

Table 7.8. Change in volatility and share of staple exports from ECOWAS member countries under alternative scenarios, 2008–2025

	Point change in volatility compared with baseline			Percentage point change in share compared with baseline		
Country	**10 percent reduction in trade cost**	**Removal of harassment costs**	**10 percent increase in crop yields**	**10 percent reduction in trade cost**	**Removal of harassment costs**	**10 percent increase in crop yields**
Benin	-0.073	-0.043	-0.085	2.756	-0.338	2.448
Burkina Faso	-0.213	0.077	-0.027	0.398	0.545	0.530
Côte d'Ivoire	-0.126	-0.026	-0.066	-0.351	0.428	-0.843
Gambia	-0.039	-0.206	-0.294	-0.047	0.026	-0.052
Ghana	-0.023	-0.079	-0.088	-0.609	0.227	-0.704
Guinea	0.002	0.160	0.116	-0.144	0.095	-0.151
Guinea-Bissau	0.086	0.055	-0.082	0.009	0.005	0.016
Liberia	-0.001	0.136	0.094	-0.002	0.003	-0.002
Mali	0.031	0.057	-0.017	-3.137	0.069	-4.475
Niger	0.091	-0.129	-0.241	1.111	-1.115	3.247
Senegal	0.019	0.137	0.126	-0.020	0.014	-0.016
Sierra Leone	0.666	-0.073	-0.242	0.075	0.016	0.045
Togo	0.083	0.150	0.046	-0.038	0.026	-0.042

Source: Authors' calculations based on ITC (2016) and Regional Economywide Multimarket Model simulation results.

Conclusion

The distribution and correlation of production volatility, as well as the current patterns of specialization in the production and trade of agricultural products among West African countries, suggest that it is indeed possible to increase crossborder trade to reduce the level of instability of local food markets. The results of the baseline scenario indicate that continuing recent trends would sustain the expansion of intra-regional trade flows in the ECOWAS region. The findings also reveal that it is possible to significantly boost the pace of regional trade expansion, which in turn would contribute to creating more resilient domestic food market through a modest reduction in the overall cost of trading, a similarly modest increase in crop yields, or the removal of barriers to transborder trade. More importantly, the simulation results also suggest that such policy actions to promote transborder trade would reduce volatility in regional markets and help lower the vulnerability of domestic food markets to shocks.

References

Badiane, O. 1988. *National Food Security and Regional Integration in West Africa*. Kiel, Germany: Wissenschaftsverlag Vauk.

Badiane, O., T. Makombe, and G. Bahiigwa, eds. 2014. *Promoting Agricultural Trade to Enhance Resilience in Africa*. ReSAKSS Annual Trends and Outlook Report. Washington, DC: International Food Policy Research Institute.

Balassa, B. 1965. "Trade Liberalisation and 'Revealed' Comparative Advantage." *The Manchester School 33* (2): 99–123.

Bouët, A, D. Laborde, and L. Deason. 2014. "Global Trade Patterns, Competitiveness, and Growth Outlook." *In Promoting Agricultural Trade to Enhance Resilience in Africa*, edited by O. Badiane, T. Makombe, and G. Bahiigwa. ReSAKSS Annual Trends and Outlook Report. Washington, DC: International Food Policy Research Institute.

CEPII (Centre d'Etudes Prospectives et d'Informations Internationales). 2015. "BACI: The International Trade Database at the Product Level." Accessed April 2017. www.cepii.fr/CEPII/en/bdd_modele/ presentation.asp?id=1.

Cuddy, J., and P. Della Valle. 1978. "Measuring the Instability of Time Series Data." *Oxford Bulletin of Economics and Statistics* 40 (1): 79–85.

Diao, X., B. Fekadu, S. Haggblade, A. Taffesse, K. Wamisho, and B. Yu. 2007. *Agricultural Growth Linkages in Ethiopia: Estimates using Fixed and Flexible Price Models*. IFPRI Discussion Paper 695. Washington, DC: International Food Policy Research Institute.

FAO (Food and Agriculture Organization of the United Nations). 2014. FAOSTAT database. Accessed April 2017. www.fao.org/faostat/en/#home.

ITC (International Trade Center). 2016. Trade Map database. Accessed April 2017. www.trademap.org.

IRTG (Improved Road Transport Governance Initiative). 2010–2012. *Improved Road Transport Governance on Primary Corridors*. Monthly newsletters. Mimeo.

Koester, U. 1986. *Regional Cooperation to Improve Food Security in Southern and Eastern African Countries.* IFPRI Research Report 53. Washington, DC: International Food Policy Research Institute.

Laursen, K. 2000. Trade Specialisation, Technology and Economic Growth: *Theory and Evidence from Advanced Countries*. Cheltenham: Edward Elgar.

Nin-Pratt, A., B. Johnson, E. Magalhaes, L. You, X. Diao, and J.Chamberlain. 2011. *Yield Gaps and Potential Agricultural Growth in West and Central Africa*. Washington, DC: International Food Policy Research Institute.

8. SUMMARY AND CONCLUSIONS

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This report has presented an examination of the recent trends, current status, and future outlook of African agricultural trade in global and regional markets. In this final chapter, the report's findings are briefly summarized, and general conclusions and policy recommendations are presented.

The findings presented in Chapter 2 indicate that, although African exports have grown over time, imports have increased more rapidly, leading to a growing trade deficit. The increase in imports was due to demographic changes, as well as the low competitiveness of domestic producers. Despite the increase in agricultural exports, their share of Africa's total exports fell by half during 1998–2013 based on more rapidly rising exports of minerals and oil. Africa's agricultural exports appear to have become moderately more diversified during this timeframe, whereas imports remained fairly stable. The European Union (EU) remains Africa's top trading partner, but both imports from and exports to the EU declined during 1998–2013. Trade with Asia increased, such that—if these trends continue—Asia is likely to replace the EU as Africa's top trading partner. Efforts to pursue increased economic integration led to significant increases in intra-regional trade during the period, although, as of 2013, the overall level of intra-regional trade remained low.

Chapter 3 focused on intra-regional trade patterns, both Africa-wide and among the four major regional economic communities (RECs): the Economic Community of West African States (ECOWAS), the Economic Community of Central African States (ECCAS), the Common Market for Eastern and Southern Africa (COMESA), and the Southern African Development Community (SADC). Findings indicate that intra-African trade expanded significantly during 1998–2013, increasing by about 12 percent per year on average. The largest increase occurred in the ECCAS region, whereas the lowest increase was in the SADC region. Regional trade integration—measured as the ratio of trade within each of the four RECs to the total trade of each REC across Africa—was highest in ECOWAS and lowest in ECCAS. COMESA and SADC play larger roles as destinations for and origins of African trade than do the other two RECs.

Chapter 4 presented a review of changes in the competitiveness of exports of different countries and agricultural products during 1998–2013, and investigated the determinants of these changes through econometric analysis. Findings indicate that, in most RECs, member countries increased or maintained their competitiveness in global and regional markets; the exception was ECCAS, whose member countries tended to lose competitiveness. Improvements in the competitiveness of the member countries of COMESA, ECOWAS, and SADC primarily occurred in intra-regional markets. With some exceptions, the majority of African export commodities gained competitiveness in global markets. The most competitive commodities accounted for fairly small export shares, however, suggesting that potential exists to expand exports by leveraging gains in competitiveness. Determinants of competitiveness improvements were found to include the ease of doing business, institutional quality, the size of the domestic market, and the quality of customs.

Chapter 5 presented an examination of factors contributing to Africa's improved agricultural export performance, using a gravity model to assess the importance of different determinants of trade and of the constraints to further improving exports. Findings indicate that supply-side constraints (including production capacity and the cost of trade) affect trade performance to a greater extent than do demand-side constraints (including trade policies and agricultural supports in importing countries). This suggests a focus on removing domestic constraints to increased trade. Nontariff barriers to trade were also found to be increasing and to present larger obstacles to exports than do tariffs. Findings highlight the potential of RECs to promote the removal of barriers to trade at both the regional and global levels, as well as the continued importance of global cooperation to facilitate trade.

Chapter 6 presented a review of a broad range of domestic and global factors within and beyond the agricultural sector that affect African trade performance and outlook. Emerging issues, such as climate shocks and increasing nontariff barriers to trade, present threats to trade performance. The chapter also addressed a variety of developments with the potential to boost African trade, including the development of a modern agribusiness sector, increasing regional integration, changing perceptions of agriculture on the part of youth, investments in hard and soft infrastructure, and efforts to increase domestic capacities to engage in trade. Evidence indicates the need for action on a wide range of fronts, including increased smallholder productivity and commercialization, increased regional integration and harmonization of standards, and continued investments in infrastructure and financial services.

Chapter 7 presented an examination of the potential for increased intra-regional trade in West Africa, the feature region of this report, to stabilize domestic food markets in the region. Findings indicate that the distribution of production volatility among West African countries suggests significant potential to lessen the impacts of domestic shocks through increased regional trade, while patterns in agricultural production and trade show scope for increasing regional trade levels. Analysis of a simulation model shows that intra-regional trade is expected to increase under current trends. Intra-regional trade growth can be accelerated through small reductions in trading costs, small increases in crop yields, or a reduction in trade barriers. The increased intra-regional trade resulting from these changes would reduce food price volatility in regional markets.

The analyses presented in this report demonstrate undeniable improvements in Africa's trade performance since the late 1990s, in both global and regional markets, as is reflected by the overall increase in competitiveness for the majority of countries and commodities. Nevertheless, progress has been uneven, with some regions and countries consistently underperforming others. Challenges remain in further enhancing Africa's competitiveness in global markets and in increasing intra-regional trade, which remains below its potential despite significant recent improvements. The findings of Chapter 4 point to the importance of the institutional and business environment in improving a country's export competitiveness, while Chapter 5 also emphasizes the role of domestic factors in increasing exports, including production capacity and trading costs. Global trade policies and international cooperation also play a large role in facilitating trade, as is discussed in Chapter 6. Chapter 7 focuses on West Africa, demonstrating the role of potential domestic and regional policy actions to increase intra-regional trade and enhance the stability of regional markets.

The chapters suggest a series of recommendations for policymakers, including (1) efforts at country and regional levels to increase agricultural productivity along the value chain, improve market access, and improve the functioning of institutions; (2) regional actions to enhance economic integration and harmonize standards and procedures; and (3) Africa-wide efforts to promote trade facilitation in international negotiations. Policy actions such as these can influence the trends described in this report and accelerate improvements in Africa's trade performance, thereby increasing incomes and improving food security across the continent.

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