

3. Global Value Chains: Where Are You?

The Missing Link in Sub-Saharan Africa's Trade Integration

This chapter reviews the extent and strength of integration of sub-Saharan Africa into the global economy, with a special focus on trade and participation in global value chains. It evaluates how trade integration has contributed to economic performance in recent decades. Looking ahead, it examines the factors likely to allow the region to tap its still substantial trade integration potential, in particular through better positioning in global and regional value chains to support durable growth and foster structural transformation.

The mid-1990s ushered in two decades of strong and sustained growth in sub-Saharan Africa. The growth take-off has been attributed to a combination of factors, not only sound macroeconomic policies implemented by the authorities in the region, but also fiscal space created post-debt relief, the strengthening of political and economic institutions, and, in a growing number of countries, exit from fragility. Favorable external conditions have undeniably also played a role, with strong demand from advanced economies until the global financial crisis, and from emerging markets afterward, especially for raw materials. These external conditions are, however, turning less supportive, as elaborated in Chapter 1.

In that context, this chapter investigates the extent of the region's integration into the global economy to shed light on how it can best leverage growing trade ties and, in future, ensure sustainable and durable growth. The main findings of the chapter are:

- The region's trade openness has increased strongly since the mid-1990s, reflecting new partnerships with emerging markets, especially China, and budding intraregional trade. High demand for commodities has played a significant role for oil-exporting countries.

This chapter was prepared by a team led by Céline Allard, comprising Jorge Iván Canales Kriljenko, Wenjie Chen, Jesus Gonzalez-Garcia, Emmanouil Kitsios, and Juan Treviño. Research assistance was provided by Cleary Haines and George Rooney.

However, the export structure of the rest of the region is less skewed toward raw materials, even for other nonrenewable resource exporters.

- Increased trade has been a powerful engine for growth. Yet, labor productivity gains have trailed increases observed in other regions in the last 20 years. In addition, by being more integrated into the global economy, the region is now more vulnerable to external shocks.
- Substantial opportunities for further regional and global trade integration still lie ahead. Despite strong growth in trade flows, sub-Saharan Africa's trade has barely kept pace with the expansion of global trade, even as other regions managed to increase their weight in the global trade network over the same period. Indeed, even after accounting for lower levels of income and economic size, generally longer distances and a large number of landlocked countries, levels of trade flows emanating from sub-Saharan Africa are found to be only half the magnitude of those experienced elsewhere in the world.
- Likewise, the region still has some way to go to better integrate into global value chains—a process that has been associated elsewhere in the world with higher level of activity and income growth over time—as has happened in southeast Asia or eastern Europe. However, while oil-exporting countries are clearly lagging behind, many other countries, both commodity and non-commodity exporters, are showing progress, even if from very low starting points, with the East African Community (EAC) and the Southern African Customs Union (SACU) particularly bright spots. In countries that have made the largest strides into global value chains, such as Ethiopia, Kenya, Seychelles, South Africa, or Tanzania, manufacturing, agriculture and agro-business, and to a lesser extent, transport, tourism, and textiles, have benefited the most from deeper integration.

These results highlight the potential sectors where the region could build on its comparative advantages, provided the business environment is sufficiently conducive.

- In that respect, our analysis suggests that, to leverage the region's trade potential, and ensure in the process strong job creation and durable growth—especially at a juncture when external demand for commodities is turning less supportive—it is more critical than ever to make progress in filling the infrastructure gap, lowering tariff and nontariff barriers, and improving the business climate and access to credit, while continuing to enhance education outcomes.

INTERNATIONAL AND REGIONAL INTEGRATION OVER THE LAST 20 YEARS

Increased Openness and New Trade Partnerships

Sub-Saharan Africa's trade experienced rapid expansion over the last 20 years.

- While cumulative nominal GDP growth for the region amounted to a substantial 350 percent (in U.S. dollars) over 1995–2013, the equivalent increase for goods exports was even larger, at 500 percent. Over the same period, global trade expanded by 260 percent. The region's export-to-GDP ratio rose from 20½ percent in 1995 to 27½ percent in 2013, while the import-to-GDP ratio increased from 19 percent to 23 percent.
- In the process, the destination of sub-Saharan Africa's exports changed substantially: trade flows with advanced economies, which represented close to 90 percent of exports in 1995, slumped in the wake of the global crisis. Meanwhile, new trade partnerships were forged with emerging markets, such as Brazil, China, and India. China is now the most important single trading partner of sub-Saharan Africa

(October 2014 *Regional Economic Outlook: Sub-Saharan Africa*).¹

- Meanwhile, the share of intraregional trade almost doubled, although from a very low base, to reach 3½ percent of the region's GDP.

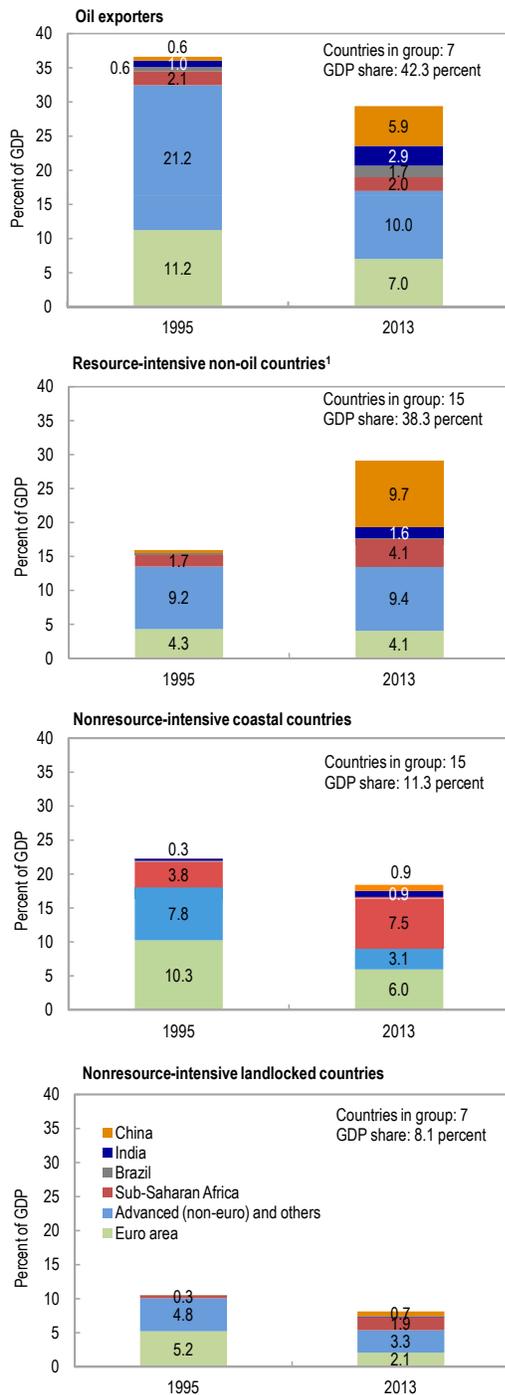
Trade patterns, however, are extremely heterogeneous across the region. In fact, while the export-to-GDP ratio has more than doubled for resource-rich non-oil exporters over 1995–2013—with South Africa accounting for about two-thirds of that increase—it has stagnated for non-commodity exporters as a group, and even dropped for oil exporters (Figure 3.1).

A more country-specific analysis corroborates these findings (Figure 3.2):

- *New natural resource exporters* over the period, such as Chad and Sierra Leone, have seen their export share increase substantially, driven by growing emerging markets' demand for commodities. Conversely, export shares in most *longtime commodity exporters*, such as Angola, Equatorial Guinea, or Zambia, have declined over time—underscoring the difficulty of broadening the export base in countries with a longtime reliance on commodities exports.
- In many countries, rapid GDP growth has been accompanied by the development of buoyant nontradable sectors, leading not only to a welcome diversification of growth sources, but also to somewhat lower trade share, with *Nigeria* standing out in that respect.
- Some countries have managed to take advantage of *growing regional trade*, such as Côte d'Ivoire and Senegal in the West African Economic and Monetary Union (WAEMU); Togo in western Africa more broadly; and Botswana, Lesotho, Namibia, and Swaziland in the SACU.

¹For an in-depth analysis of growing trade ties with emerging markets, see also Chapter 3 of the October 2011 *Regional Economic Outlook: Sub-Saharan Africa*.

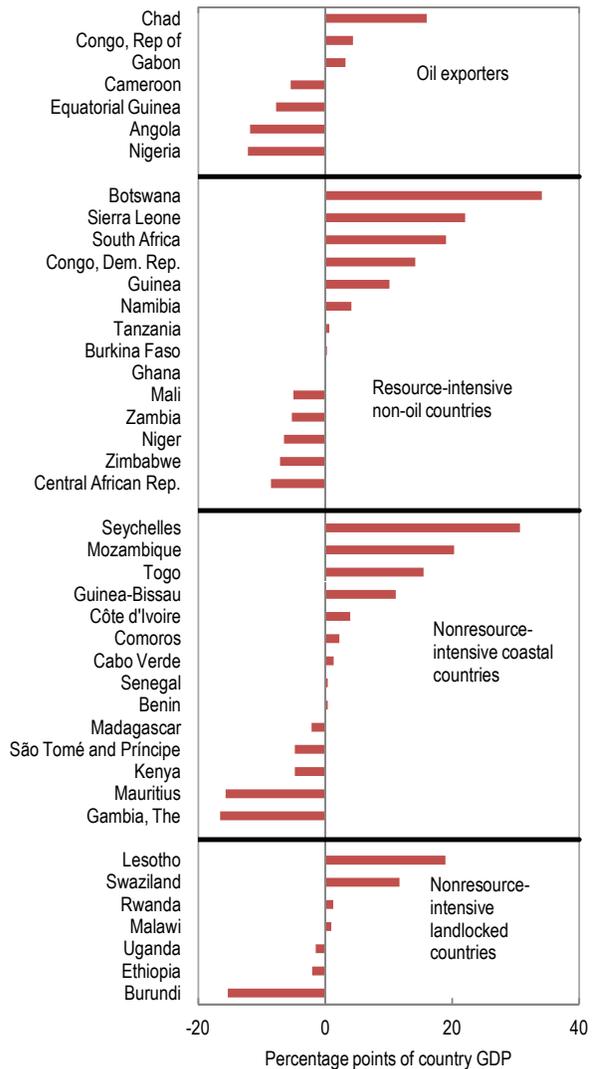
Figure 3.1. Sub-Saharan Africa: Goods Export Shares by Partner, 1995–2013



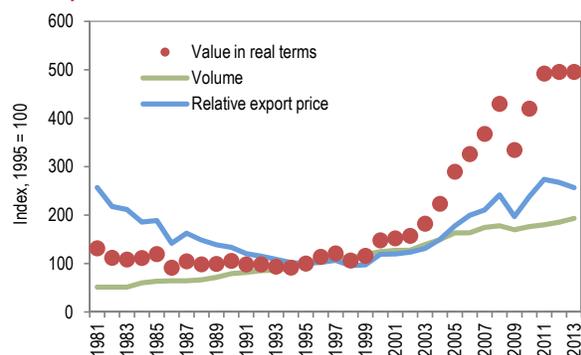
Source: IMF, *Direction of Trade Statistics*.
 Note: Excludes South Sudan due to data availability. See the list of country groups in Annex 3.2.
¹ Resource-intensive countries are defined as those for which nonrenewable resource exports are 25 percent or more of goods exports on average over 2009–12.

- *Landlocked countries* with no natural resources remain more closed economies—with exports only about 10 percent of GDP—and still struggle to increase trade integration, handicapped by poor transportation infrastructure and limited interest from emerging markets.

Figure 3.2. Sub-Saharan Africa: Change in Export Shares, 1995–2013



Sources: IMF, *Direction of Trade Statistics*; and World Economic Outlook database.
 Note: Excludes South Sudan due to data availability. See the list of country groups in Annex 3.2.

Figure 3.3. Sub-Saharan Africa: Real Export Value Decomposition, 1981–2013

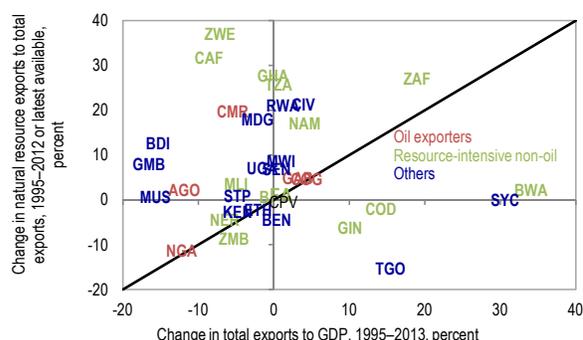
Sources: IMF, World Economic Outlook database; and IMF staff calculations.

Note: The real export value corresponds to the U.S. dollar value of exports deflated by the U.S. GDP deflator. The volume refers to real exports from the national accounts for each of the sub-Saharan African countries weighted according to the region's 2006 export structure. The relative export price is the ratio of the real export value to the export volume.

Strong Role for Commodities, Though Not Everywhere

The strong increase in the region's exports has, in part, reflected favorable price developments. That is, not only have export volumes increased, but the relative price at which sub-Saharan African countries sold these exports has surged substantially. More precisely, the fivefold increase in the real value of sub-Saharan Africa's exports over 1995–2013 (deflated by the U.S. GDP deflator) is explained by both a 2.5-fold increase in volumes and a twofold increase in the relative price at which those exports were sold, a trend in sharp contrast with the experience observed prior to 1995 (Figure 3.3). This led to a welcome increase in purchasing power for the region, and helped finance a much-needed stepping up in infrastructure investments (October 2014 *Regional Economic Outlook: Sub-Saharan Africa*). However, the improved terms of trade did not reflect stronger pricing power or better quality of exported goods, but rather a decade-long increase in commodity prices fed by tight supply conditions at the global level and strong demand from emerging markets. Unfortunately, this leaves the region's commodity exporters particularly exposed to reversal in prices.

Here too, this overall picture masks substantial heterogeneity in the structure of exports across

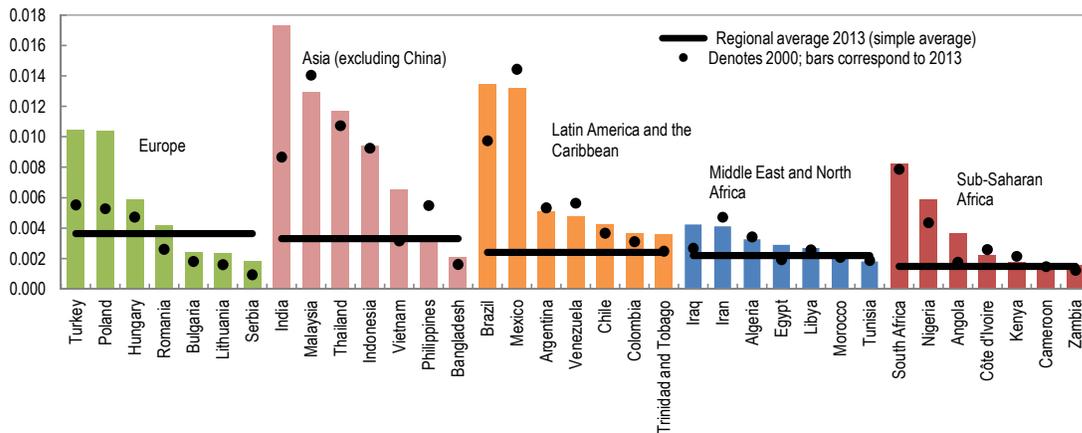
Figure 3.4. Sub-Saharan Africa: Change in Export Shares, 1995–2013

Sources: IMF, *Direction of Trade Statistics*; and World Economic Outlook database; and World Bank, *World Development Indicators*.

Note: See the list of country groups in Annex 3.2; see page 70 for list of country acronyms.

the region. While commodities represent about half of all goods and services exports for sub-Saharan Africa as a whole, this ratio climbs to 80 percent for the eight oil exporters, but conversely drops to about 35 percent for other countries, including those that export commodities other than oil—a share that is quite similar to that in emerging market and low-income countries elsewhere in the world.

Indeed, while the decline or stagnation in export ratios in many oil-exporting countries over 1995–2013 has occurred regardless of whether oil is playing a larger (Cameroon, Congo, Gabon), stable (Angola), or declining (Nigeria) role in the export structure, the situation is much more diversified among other countries (Figure 3.4). On the one hand, in South Africa and to a lesser extent Namibia, the increase in the export-to-GDP ratio has gone hand in hand with an increase in the share of commodities in exports. But in other non-oil commodity exports, such as Botswana, Democratic Republic of Congo, or Guinea, export shares progressed despite a stable or even declining role of commodity trade. Similar progress was registered by nonresource-intensive countries such as Seychelles and Togo. On the other hand, some resource exporters, such as Central African Republic and Zimbabwe, saw their export ratios drop despite a ramp up in the share of commodity exports.

Figure 3.5. World Trade Centrality per Region, 2000–13

Source: IMF staff calculations based on data from IMF, *Direction of Trade Statistics*.

Note: This measure is the PageRank centrality and takes into account the size of exports for any given country, the number of its trade partners, and the relative weight of these partners in global trade (see Brin and Page 1998 for a description of the computation).

Only emerging market and developing countries with 2013 GDP per capita below US\$20,000 from each region are considered. China is excluded from the Asia group as its centrality measure is about 28 times higher than the average for that region and five times the second largest centrality measure, corresponding to India.

But Barely Keeping up With the Rapid Expansion of Global Trade

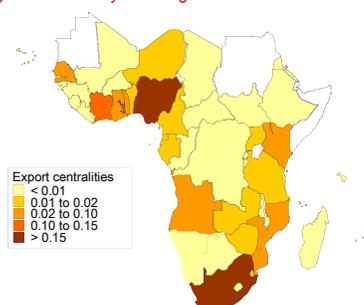
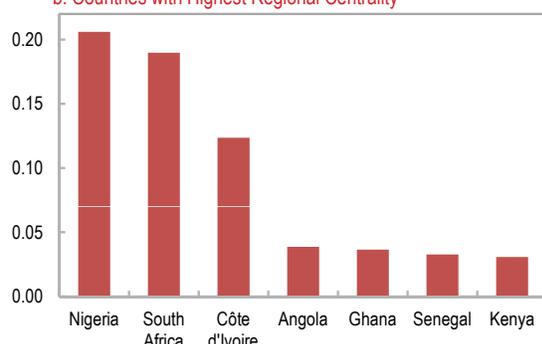
Sub-Saharan Africa's overall progress in trade integration also needs to be put in perspective with developments in global trade over the same period. Global trade took off following the implementation of the Uruguay Round, the creation of the World Trade Organization (WTO) in 1995, and China's subsequent entry into the WTO in 2001. This rapid expansion was characterized by the emergence of new trade giants and the decline in advanced economies' contribution to world trade. In fact, it is only to the extent that sub-Saharan Africa was able to redirect trade toward these new trade players, particularly China, that it managed to keep its place in world trade—a place that nonetheless remains small in the global scene. As a simple illustration of this fact, export ratios at the global level rose by about as much as in sub-Saharan Africa, from 17 percent of GDP in 1995 to 25 percent of GDP in 2013 (versus 20½ percent of GDP and 27½ percent of GDP in the region).

A more granular measure of the region's integration into global trade—its centrality in the global trade network—paints a similar picture. This measure takes into account not only the size of exports for a given country, but also the number of its trade

partners, as well as the relative weight of these trade partners in global trade, therefore better capturing the country's interconnectedness within the web of global trade (De Benedictis and others 2014).

By that measure, sub-Saharan Africa remains the least integrated region in the world, with an average centrality of only about half of that observed in other emerging market and developing economies (Figure 3.5). Of course, this partly reflects a relatively lower level of development than in other regions. But even South Africa, the most interconnected and one of the highest-income countries in the region, has a relative position that is substantially lower than other emerging markets such as Brazil or Mexico. And outside of Angola and Nigeria—where the large role of oil exports has led to an increase in centrality—sub-Saharan Africa's most globally integrated members have only maintained their relative foothold in the global trade network between 2000 and 2013. By contrast, countries such as China, India, Poland, Turkey, or Vietnam saw their relative centrality score double over the period. All in all, this points to substantial potential for a larger role for trade in sub-Saharan African economies.

One bright spot has been the increase in regional trade. As mentioned earlier, the share of regional trade almost doubled over the last 20 years,

Figure 3.6. Sub-Saharan Africa: Regional Trade Centrality, 2013**a. Regional Centrality Ranking****b. Countries with Highest Regional Centrality**

Source: IMF staff calculation based on data from IMF, *Direction of Trade Statistics*.

although from a low base of 2 percent of GDP to 3½ percent of GDP. Measuring centrality at the intraregional level reveals the emergence of trade subregions, with hubs such as Côte d'Ivoire, Nigeria, and to a lesser extent, Senegal in west Africa, Kenya in east Africa, and South Africa in the southern part of the region (Figure 3.6).

Financial Integration Progressing in Tandem, from Very Low Levels

As extensively documented in previous issues of this report, the rising trade integration of the region has been accompanied by an expansion of financial linkages with the rest of the world.² Improved growth prospects, the emergence of a middle class in many countries, and high global demand for raw materials all contributed to attracting large flows of foreign direct investment (FDI). Favorable financial conditions and abundant liquidity worldwide also

² See for instance the April 2011, April 2012, October 2012, and October 2014 issues of the *Regional Economic Outlook: Sub-Saharan Africa*.

led to increased availability of funds for emerging and developing markets, facilitating the growing number of Eurobond issuances by sub-Saharan African frontier market countries.

Less acknowledged is the growing interconnectedness in the regional financial landscape. Regional financial linkages have been expanding in recent years, albeit from a very low base (April 2012 *Regional Economic Outlook: Sub-Saharan Africa*). This process has been partly influenced by increasing regional trade flows and the expansion of several sub-Saharan African companies into new regional markets—which have in some cases led to the opening of bank subsidiaries or the nascent integration of financial markets, as in the WAEMU. Progress in regional financial integration along the dimensions of FDI, regional financial infrastructure, bond markets, and the expansion of pan-African banking groups are described in more detail in Annex 3.1.

TRADE OPENNESS AND MACROECONOMIC PERFORMANCE

Over the last 20 years, expanding trade flows have coincided with rapid growth and generally better macroeconomic performance in the region. This section examines the relative role of rising trade openness on growth and labor productivity.

Expanded Trade a Boon for Growth

Sub-Saharan Africa's real GDP per capita growth substantially accelerated toward the end of the 1990s, to average 4.3 percent per year over the 2000s, compared with 2.9 percent a decade earlier. Increased political stability, better macroeconomic management and access to financing, as well as an improved business climate, supported investment efforts, thereby improving the productive capacity in the region. But increased trade integration also played a role, not only via higher demand for exported goods, but also by fostering competition and enabling some transfer of technology and efficiency gains from imported intermediary goods. Indeed, average trade openness—measured here

as the sum of exports and imports in percent of GDP—increased from 41 percent of GDP in the 1990s to 45 percent of GDP in the 2000s, with a clear positive trend in the past three decades and an acceleration in the 2000s (Figure 3.7).

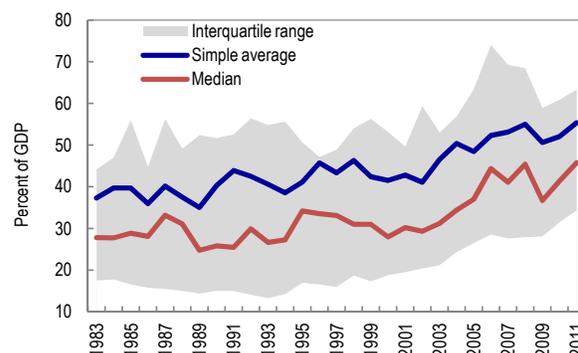
To disentangle the respective role of these factors, an econometric analysis is conducted, following previous studies on growth determinants, relating growth in GDP per capita in sub-Saharan African countries over 1980–2010 to the initial level of development (because lower starting points tend to be associated with higher growth rates as countries catch up), investment and consumption ratios (because they affect physical capital and available domestic savings to support long-term growth), trade openness, and changes in terms of trade (Moral-Benito 2012; Dollar and Kraay 2003; see Annex 3.2, Section 1).³ The analysis finds that increased trade has had a significant and positive influence on growth in sub-Saharan Africa. More specifically, both the increase in trade openness and the improvement in terms of trade have contributed to the acceleration of per capita GDP growth. Of the 1.4 percentage point increase in the annual rate of growth of per capita GDP between the 1990 and 2000 decades, the increase in trade openness is estimated to have contributed 0.6 percentage point, and improved terms of trade another 0.2 percentage point (Figure 3.8). Together, they account for about half of the increase in average per capita GDP growth in the region. However, it is important to remember that this increased trade integration has also made the region more vulnerable to external shocks, as documented in Chapter 1 of the October 2014 *Regional Economic Outlook: Sub-Saharan Africa* and as exemplified by the current situation of oil exporters.

Yet Productivity Gains Have Lagged

While global integration is found to have supported overall growth, labor productivity itself has not benefited as much as in other regions undergoing trade integration, as evidenced by the slopes of regional trajectories in Figure 3.9. Over 1990–2010, the

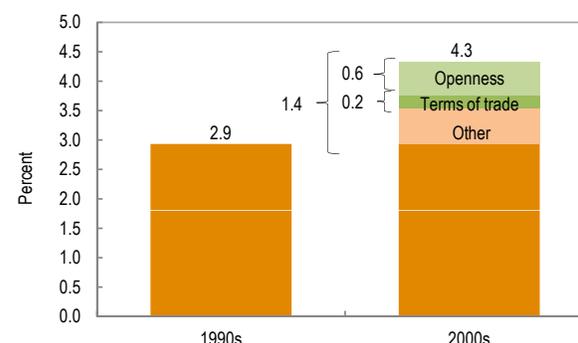
³To address endogeneity issues, we either use lagged variables or instrumentalize using a three-stage least squares (3SLS) estimation methodology (see Annex 3.2, Section 1).

Figure 3.7. Sub-Saharan Africa: Trade Openness, 1983–2011



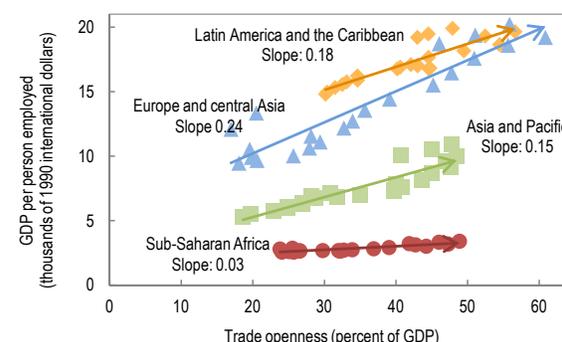
Source: Penn World Tables v. 8.0 data; and IMF staff calculations. Note: Trade openness is measured as the sum of real exports and imports in percent of real GDP.

Figure 3.8. Sub-Saharan Africa: Annual Growth in GDP per Capita



Source: IMF staff estimates.

Figure 3.9. Selected Regions: Trade Openness and GDP per Person Employed, 1990–2011



Sources: Penn World Tables 8.0; and World Bank, *World Development Indicators*.

Note: Only emerging market and developing countries from each region are considered.

increase in labor productivity generated by each percentage point increase in trade openness has been five to eight times lower than in Asia, Latin America, or emerging Europe. This is a strong reminder that increased trade openness does not necessarily translate into structural transformation and a switch to higher-productivity activities. For this to materialize in conjunction with the expansion of trade, accompanying policies have to be in place—which is the subject of the next section.⁴

WHAT CAN SUPPORT FURTHER INTEGRATION INTO GLOBAL VALUE CHAINS?

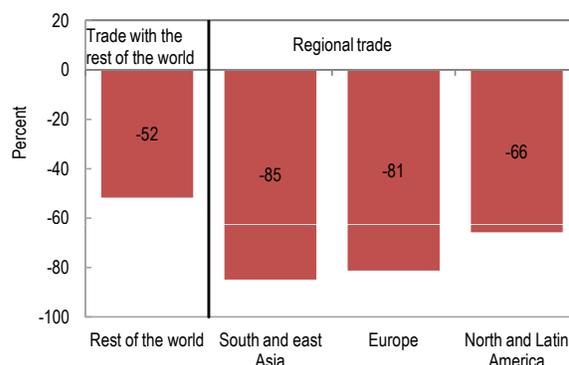
As the region has only barely kept up with the very rapid expansion of global trade, and labor productivity has not risen as much as in other regions, this section assesses the extent of the trade gap in sub-Saharan Africa, and of the region's integration into global value chains—a key determinant in adding value to trade and supporting sustainable job creation. In doing so, it also identifies policy levers to both reduce that gap and increase the depth of trade.

Still Substantial Potential for Further Trade Integration

In general, trade between two countries tends to be more intense the closer the two countries are, both geographically and culturally, such as sharing a similar language or past colonial ties. In addition, the size and level of development of the trading economies are important parameters influencing trade flows. A common way in the literature to assess the relative size of such flows is to estimate “gravity models,” linking the magnitude of bilateral

⁴Elson (2013), for example, lists fiscal solvency and external sustainability, as well as efforts to improve education outcomes, the quality of the labor force, institutional capacity to deliver on infrastructure, and the overall level of the business climate as key policy requirements to translate higher trade openness into higher productivity. Similarly, Alcalá and Ciccone (2004) find that trade affects labor productivity through total factor productivity, and that institutional quality has a significant effect on productivity.

Figure 3.10. Sub-Saharan Africa: Trade Flows Compared with Other Regions



Sources: IMF, World Economic Outlook database; World Economic Forum; and IMF staff calculations.

Note: Sub-Saharan Africa trade compared with trade of other regions, after controlling for size, level of development, cultural ties, and geographical conditions.

trade flows to these very characteristics of the trading countries (Head and Mayer 2014).

In such a model covering 167 countries, exports and imports from sub-Saharan Africa are found to be significantly lower than trade flows elsewhere in the world. This partially reflects lower levels of income in sub-Saharan Africa, as well as relatively longer distances and a higher number of landlocked countries in the region (see Annex 3.2, Section 2). But even after accounting for these, bilateral trade flows from sub-Saharan Africa tend to be on average 50 percent lower than trade flows elsewhere in the world (Figure 3.10). Likewise, sub-Saharan African regional trade is found to be much smaller than regional trade in most other regions in the world—85 percent lower than in south and east Asia, 80 percent lower than in Europe, and 65 percent lower than in North and Latin America.⁵ Only regional flows in the Middle East and Central Asia compare in size with those in sub-Saharan Africa. It is noteworthy that sub-Saharan African regional trade exhibits such large gaps despite the existence of numerous intraregional trade agreements—possibly because their overlapping groupings greatly reduce their effectiveness.

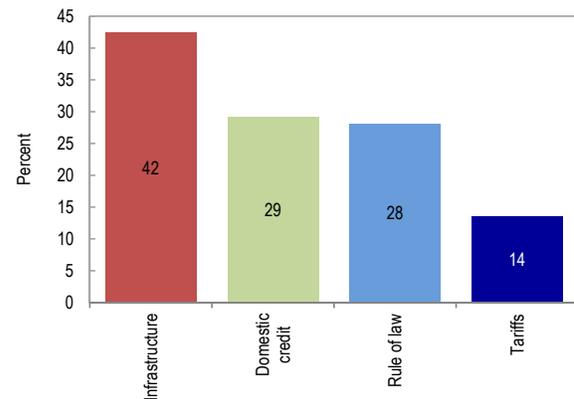
⁵Unrecorded flows across borders within sub-Saharan Africa are likely to be larger than elsewhere in the world, and the gaps are possibly overestimated as a consequence. Nonetheless, given the magnitude of the gaps estimated here, these would persist even with more comprehensive data coverage.

What explains these substantial gaps? To shed light on that question, the gravity model (described in Annex 3.2, Section 2) is augmented to include determinants such as the rule of law, tariff levels, the quality of infrastructure, and the level of credit to the private sector, as is frequently done in the literature (see for example, Nordås and Piermartini 2004). These factors are found to play a significant role in further explaining the extent of bilateral trade flows at the global level. All else equal, a more supportive business environment, lower tariffs, better infrastructure, and easier access to credit all favor larger trade flows. And these factors are substantially less conducive to trade in sub-Saharan Africa, with the quality of infrastructure about half that found elsewhere in the world, credit-to-GDP ratios about a third of ratios elsewhere, and tariffs on average four times higher than elsewhere (Figure 3.11).⁶ More specifically:

- Infrastructure appears as the most important impediment to trade for the region. In fact, bringing the quality of infrastructure to the average level observed elsewhere in the world would help enhance sub-Saharan African trade by as much as 42 percent, as this would substantially lower the cost of cross-border movements of goods. Indeed, a substantial effort to fill the infrastructure gap is currently underway in the region, as elaborated in Chapter 3 of the October 2014 *Regional Economic Outlook: Sub-Saharan Africa*.
- Further efforts to improve governance and the business climate would also have a very favorable effect: raising the index of rule of law to the average level elsewhere in the world would generate another 28 percent increase in sub-Saharan African trade flows. In particular, measures to lower nontariff impediments to trade—export taxes and duties, but also corruption, regulatory requirements, and delays

⁶The rule of law and infrastructure quality indicators are taken from the Global Competitiveness Indicators database from the World Economic Forum. Tariffs are computed as averages of applied rates weighted by the import shares of each partner country, and credit availability refers to domestic credit provided by the financial sector in percent of GDP; both were obtained from the World Development Indicators database from the World Bank.

Figure 3.11. Sub-Saharan Africa: Potential Increase in Trade



Sources: IMF, World Economic Outlook database; World Economic Forum; and IMF staff calculations.

Note: Percent Increase in sub-Saharan Africa's trade if the variable moves from the average for sub-Saharan Africa to the average for the rest of the world.

- in clearing customs that all add up to extra costs—would greatly improve prospects for trade, especially at the regional level.
- Likewise, access to credit for the private sector plays a paramount role for the region's trade. Further financial deepening to the level observed elsewhere in the world would support an expansion of trade by as much as 29 percent. Such expansion would need, however, to be accompanied by adequate macroprudential frameworks to carefully manage the corresponding risks.
- Finally, continuing to work toward lowering tariffs in the region would further support the development of both international and regional trade. Bringing tariffs to the average global level could yield about 14 percent additional trade. One consideration, though, is that taxes on trade still represent a substantial source of fiscal revenues for many countries in the region, and policies to lower tariffs need to go hand in hand with continued efforts to increase revenue mobilization from other sources.
- At the regional level, deepening existing customs unions with further economic integration would help, as the examples of the EAC and WAEMU illustrate: all else equal, cross-border exchanges within the EAC are found to be five times larger than average

regional trade flows within sub-Saharan Africa; in the WAEMU, they are about three times larger. But having a single currency by itself is not enough, as evidenced in the Central African Economic and Monetary Community (CEMAC), where intra-currency union trade flows are not found to be significantly higher than regional flows outside the currency union.

Much More Scope for Insertion into Global Value Chains

Beyond the pure expansion of trade, an additional dimension of globalization over the last two decades has been the emergence of global value chains. In an increasingly integrated world economy fueled by technological progress, cheaper transportation and communication costs, and policy reforms in support of trade, production processes have become more dispersed across the globe. This has given rise to systems of supply chains in which value is added at each stage before crossing the border to be passed on to the next stage—global value chains. This process has allowed countries to better exploit their comparative advantages, by giving them the opportunity to join a production chain without having to provide all the other upstream capabilities, and has been particularly at play in southeast Asia around Japan and China and in eastern Europe around Germany (IMF 2013a; IMF 2013c; Chapter 3 of IMF 2014a; and IMF 2015d).

For countries with a limited existing manufacturing or service export base and a large pool of labor, such as many in sub-Saharan Africa, this development can provide a golden opportunity. By specializing in a specific segment of the production chain, each participating country can generate a portion of the goods or services' value added—whereas producing the whole product from scratch would never have been within reach in an increasingly competitive world—even if it means that a lower share of the value added of exports is captured locally. Although certain preconditions such as sufficient levels of capacity, quality, and efficiency are required to join global value chains (Baldwin 2014; WTO 2014), these threshold levels can be exceeded over time through technology and knowledge transfers from other countries—most often in the form of FDI.

Furthermore, knowledge transfers from other producers in the value chain and, eventually, upgrading to higher value-added segments of the production chain can support productivity and income growth. Asian countries have championed this model, initially contributing to the most labor-intensive activities in the production process and gradually moving into more sophisticated portions of the value chain over time.

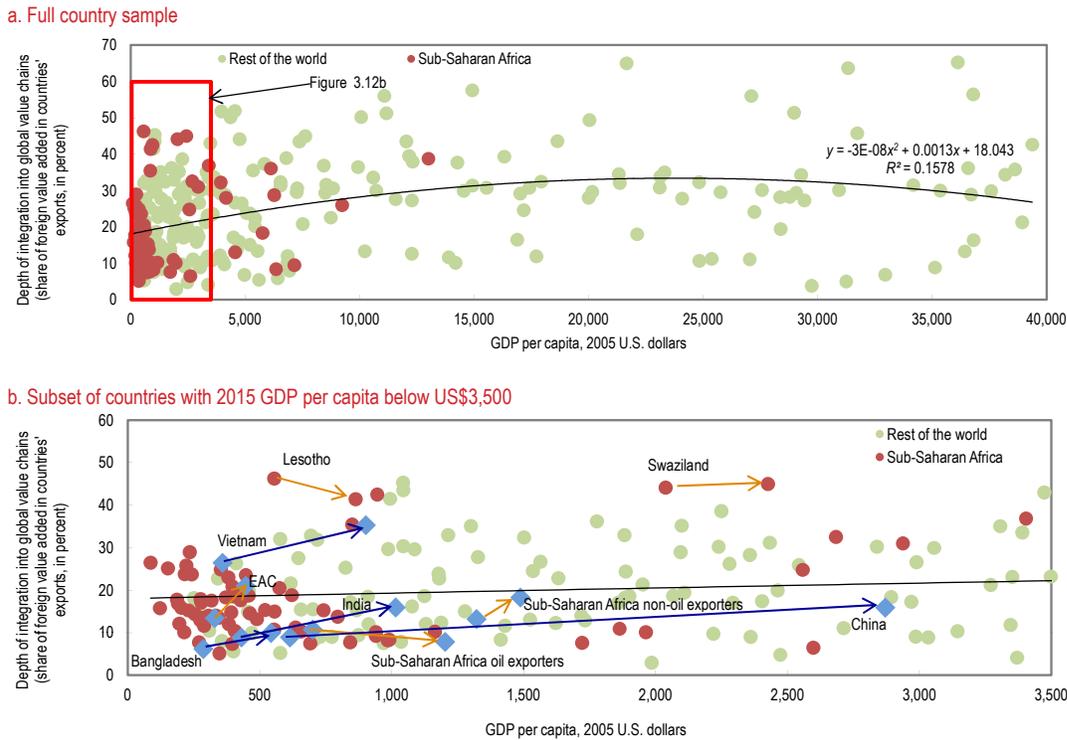
At the global level, the integration into global value chains has indeed been accompanied by a pickup in income levels. To measure the depth of this integration, the literature usually looks at the extent of foreign value added in a country's exports (traditionally referred to as backward integration; see also Box 3.1). By this measure, rising depth of integration has been associated with rising income over time for developing and emerging market economies (Figure 3.12a). In pursuing a strategy of development anchored around the integration into one intermediary link of the value chain, many countries have managed to lift their income levels as they gradually acquired new capabilities, benefited from knowledge spillovers, and eventually, from opportunities to diversify production and upgrade quality (UNCTAD 2013). In addition, enhanced participation in global value chains has also been associated with more inclusive growth, especially when the sectors targeted are labor intensive and employ relatively lower-skilled workers.⁷

Where do sub-Saharan African countries stand in that landscape? Until recently, lack of data constrained the analysis, but a database released in 2014, the Eora Multi-regional Input-Output database extended the coverage to most low-income countries in the world (Lenzen and others 2012, 2013). Although, the database has caveats, which are elaborated on in Box 3.1, it allows for a first-time assessment of the region's positioning in global value chains.

Sub-Saharan African countries still generally find themselves at the start of their integration process

⁷For instance, Maertens, Colen, and Swinnen (2011) find a positive effect of integration into agricultural global value chains on poverty reduction as it provides the largely informally employed agricultural workers with low levels of education with a source of formal and paid employment.

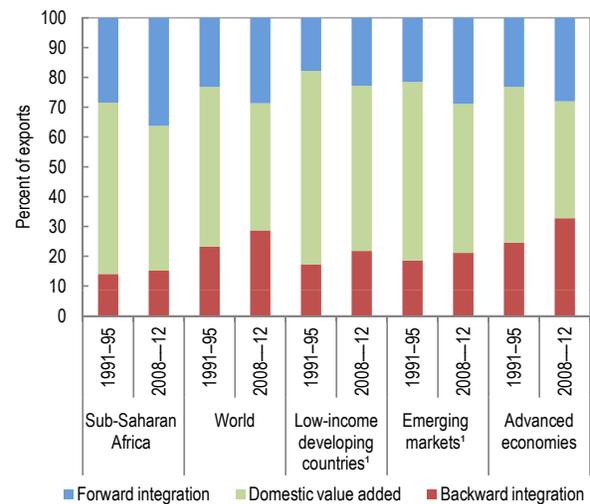
Figure 3.12. Depth of Integration in Global Value Chains and Real GDP per Capita, Average 1991–95 and 2008–12



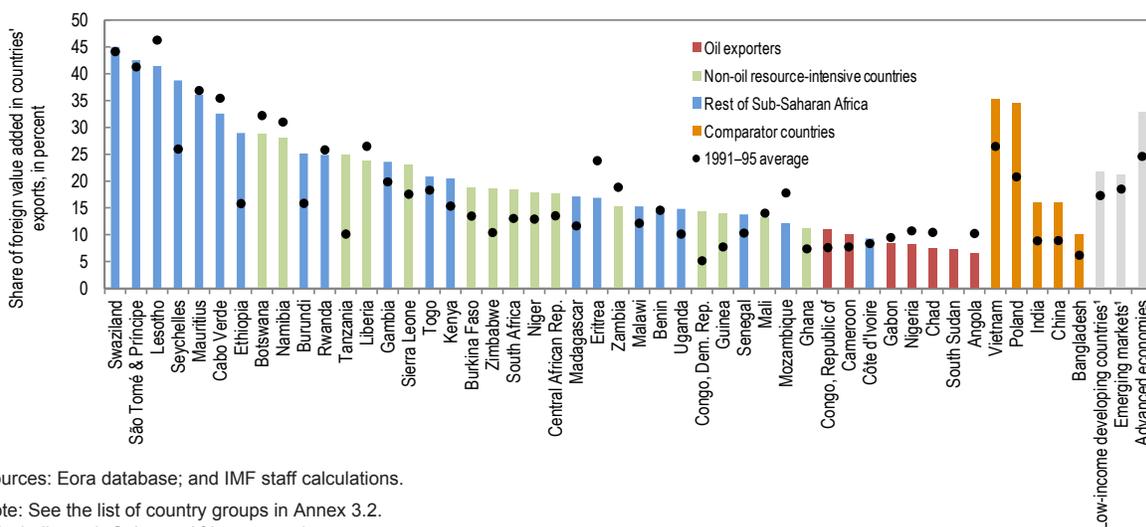
Sources: World Bank, *World Development Indicators*; Eora database; and IMF staff calculations.
Note: EAC = the East African Community.

into global value chains, having also relatively lower income levels than other regions in the world (Figure 3.12b). At 15 percent of exports, the share of foreign value added embedded in the production of exports is low even compared with the 20 percent average observed in other developing and emerging market economies. More worrisome is that the depth of its integration has barely increased since the mid-1990s, unlike in other income groups elsewhere in the world—signaling that the region has yet to join this global momentum and take advantage of it to lift productivity and create jobs (Figure 3.13). Corroborating that finding, neither the complexity of sub-Saharan African exports—measured as the diversity of products (Hausmann and others 2011)—nor the quality of exported goods—derived from price differences within specific product categories (Henn, Papageorgiou, and Spatafora 2013)—have been improving over the last two decades. In addition, compared with all other regions in the world, sub-Saharan African exports tend to enter at the very beginning of global

Figure 3.13. Participation in Global Value Chains, Average 1991–95 and 2008–12



Sources: Eora database; and IMF staff calculations.
¹Excluding sub-Saharan African countries.

Figure 3.14. Sub-Saharan Africa and Comparator Countries: Depth of Integration into Global Value Chains, Average 2008–12

Sources: Eora database; and IMF staff calculations.

Note: See the list of country groups in Annex 3.2.

¹ Excluding sub-Saharan African countries.

value chains (in the form of forward integration), as a higher share of its exports enter as inputs for other countries' exports, reflecting the still-predominant role of commodities in many countries' exports in the region.

There is, however, a significant degree of heterogeneity across sub-Saharan African countries, with some countries having fared much better than others (Figure 3.14):

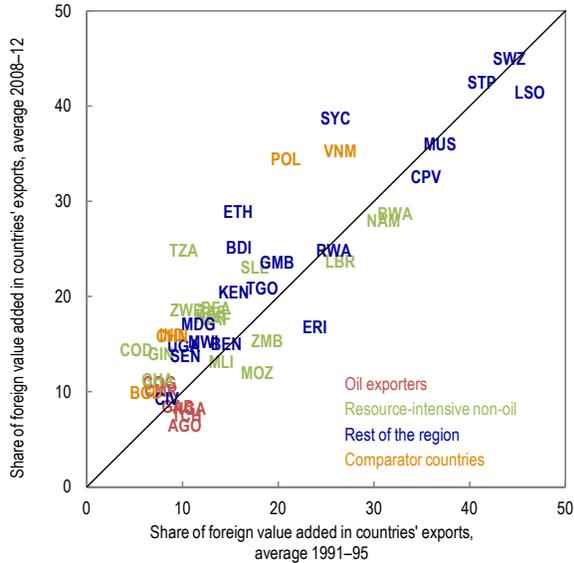
- Oil exporters are the least integrated into global value chains in terms of the foreign value added content of their exports. With the exception of Cameroon and Congo, this share has even decreased, including in countries such as Angola and Nigeria, suggesting that diversification of trade away from natural resources has stagnated, if not gone backward, over the last 20 years in these countries.
- However, in the rest of the region, a majority of countries (24 out of 35) have made progress, even if from a low starting point (Figure 3.15). The improvement is most widespread among non-oil commodity exporters, with countries such as Burkina Faso, Central African Republic, Democratic Republic of the Congo, Ghana, Guinea, Niger, Sierra Leone, and Zimbabwe all registering progress. This shows that integration into value chains can happen even in countries where commodities play a role.

- Among the best performers, progress within the EAC has been particularly strong, with Kenya, Tanzania, and Uganda exhibiting solid improvements—also a reflection of the benefits of the more general economic integration at play among these countries and their stated intention to further deepen economic and monetary ties (Drummond, Wajid, and Williams 2015; Sutton 2012).⁸ Likewise, the SACU region exhibits relatively deeper integration, both because its smaller members (Botswana, Lesotho, Namibia, and Swaziland) were already quite integrated in the early 1990s, but also because South Africa did progress over the 1990–2010 period. Conversely, both the CEMAC and the WAEMU continue to exhibit lower integration. For the former, this has to do with the high reliance on oil exports for most of its members. For the latter, this suggests that the relatively high level of interregional trade within the currency union does not reflect the emergence of a regional value chain, but rather

⁸ Foreign direct investment (FDI), including from multinational companies, is playing a critical role in deepening the integration of these countries into global value chains. For example, in 2013, Tanzania recorded the largest inflow of FDI into the region, at US\$1.9 billion (UNCTAD 2014). In Uganda, Quality Chemicals—a joint venture between a local Ugandan chemical company and the Indian company Cipla—manufactures antiretroviral drugs using imported inputs such as equipment and patents. The drugs produced are exported throughout sub-Saharan Africa.

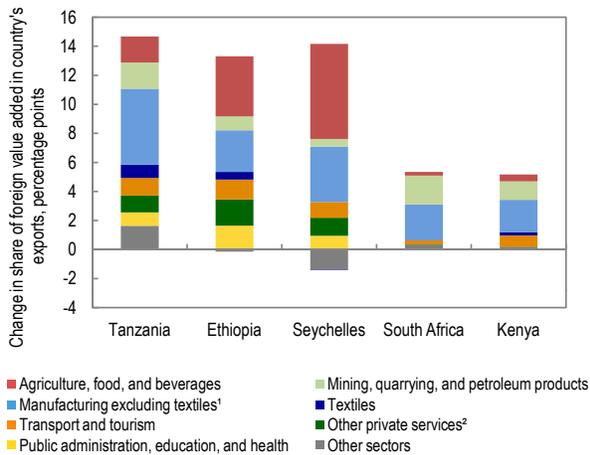
trade on final goods and services, with the depth of integration particularly low for the two largest countries of the union—Côte d'Ivoire and Senegal.

Figure 3.15. Sub-Saharan Africa: Depth of Integration into Global Value Chains, Average 1991–95 versus 2008–12



Sources: Eora database; and IMF staff calculations.
 Note: See the list of country groups in Annex 3.2.
 See page 70 for country acronyms.

Figure 3.16. Selected Sub-Saharan African Countries: Contributions to Change in Share of Foreign Value Added in Exports by Sector, 1991–95 to 2008–12



Sources: Eora database; and IMF staff calculations.
¹ Includes electrical and machinery, metal products, wood and paper, transport equipment, and other manufacturing.
² Includes construction, telecommunications, wholesale trade, maintenance and repair.

- Five countries in particular stand out, having seen the share of foreign value added in their exports increase by 5 percentage points or more in the last two decades: Ethiopia, Kenya, Seychelles, South Africa, and Tanzania (Figure 3.16). In these countries, the sectors that have benefited the most from the deepening of integration include agriculture and agro-business (especially in Ethiopia and Seychelles), manufacturing (particularly in Tanzania), but also textiles, transport, and tourism, although to a lesser extent. These examples bode well for the region: for one, the increase in depth of integration in some of these countries, at 10 percentage points or more, is of a similar magnitude to that experienced by countries such as Poland or Vietnam that are now success stories within large global value chains. They also highlight the sectors—agro-business, light manufacturing, tourism, and textiles—in which sub-Saharan Africa has potential to leverage its comparative advantages, which include a young and growing labor force, large share of unused land, and favorable climate.
- However, to leverage these comparative advantages, the business environment (infrastructure, rule of law, cost and wage competitiveness, and so on) needs to be right. On that front, more still needs to be done, judging from the broader trend decline in industrialization in the region documented in other studies (Rodrik 2015; Figure 3.17). It should be noted, though, that opportunities to participate in global value chains are not limited to manufacturing. Just as the production of goods has been broken down into different stages, services are increasingly being disaggregated and traded as separate tasks to create service value chains—as championed by India, for example.

The upshot is that the region still has an enormous potential to integrate into global value chains. By leveraging this potential, deeper ties into global value chains may help foster structural transformation, export diversification, and the possibility to absorb technology and skills from abroad. These benefits are especially important for countries with

Box 3.1. Value Added Trade and Global Value Chains

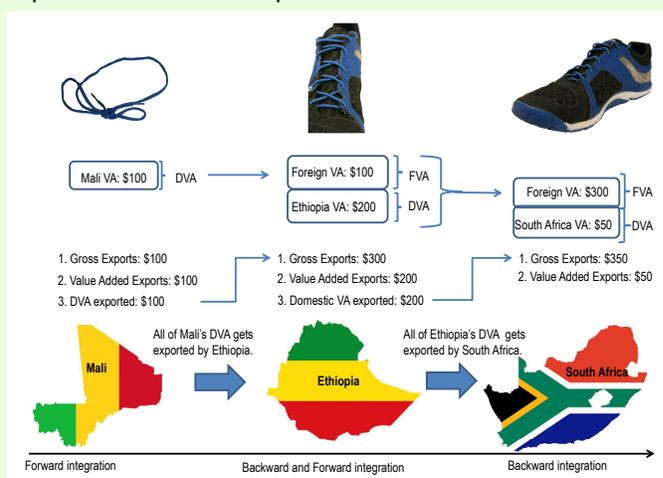
In recent decades, production stages have been finely sliced and dispersed over various countries to form global value chains that comprise a system of supply chains with value added sources and destinations. Most official trade statistics record the gross value of goods as they cross borders. However, as trade has increased in intermediate inputs that cross borders many times, gross trade data are no longer a good measure to capture the amount of domestic value added embedded in exports.

To measure a country's extent of international integration into global value chains, it is therefore necessary to know the sources and destinations of the value added embodied in the products. A budding literature on value added trade has emerged, which relies on data using intercountry input-output (IO) tables. Until very recently, the coverage on sub-Saharan African countries was sparse. We use the newly created Eora database, which provides global multi-region IO tables, to derive value added trade for 189 countries from 1990 to 2012. The main advantage of using Eora is the depth of its coverage, in terms of countries (189), industries (about 16,000), and time (23 years), which is unmatched by any other existing database. Eora covers 42 out of the 45 countries in sub-Saharan Africa. While this extended coverage makes the database invaluable for the analysis conducted here, it should be remembered that some missing data in the IO tables are filled through optimization procedures using as a basis existing national and global statistics; this means that our results should not be taken as exact and precise measures, although we believe the gist of the results to be robust.

The literature traditionally decomposes exports into three distinct components, which are used to measure global value chain participation:

- Foreign value added (FVA) that has been imported from foreign suppliers upstream in the global value chain. This share is referred to as *backward integration*, and reflects the extent to which a country is integrated relatively downstream of the value chain.
- Domestic value added of products consumed directly in the country where it is exported.
- Domestic value added of products that enter themselves into the production of other countries' exports. This share is referred to as *forward integration*, and reflects the extent to which a country is integrated relatively upstream of the value chain.

Figure 3.1.1. Global Value Chains and Value Added Components of Exports—An illustrative Example



The sum of the last two components correspond to the total value added that is created domestically (DVA), and that contributes toward its GDP. The sum of FVA and DVA results in the total value of gross exports. Figure 3.1.1 highlights these global value chain indicators in a fictitious example involving three countries, although global value chains typically involve many more players. From the viewpoint of Ethiopia, its backward integration is represented by the value of its foreign inputs: the \$100 value of shoelaces that were completely produced in Mali.

Source: IMF staff.

Note: DVA = domestic value added in exports; FVA = foreign value added in exports.

Meanwhile, Ethiopia's forward integration is the domestic value added that is exported to South Africa, and then further exported by South Africa—namely Ethiopia's domestic value added of \$200 that is incorporated into South Africa's final shoe exports. South African exports, in turn, are composed of \$300 previously imported and \$50 of domestic value added generated in South Africa.

The example shows that value added is counted several times in gross exports statistics, in contrast to statistics based only on value added. Total gross exports by the three countries is \$750; however, the total domestic value added exported is only \$350 (Mali: \$100 + Ethiopia: \$200 + South Africa: \$50). Also, the example highlights the large discrepancy that may appear between gross exports and domestic value added exported: although South Africa has the largest value of gross exports, its own domestic value added is the smallest, while Ethiopia has incorporated the largest domestic value added of the final product.

relatively small domestic markets, such as many in sub-Saharan Africa. In addition, by enabling strong job creation, a deeper integration into global value chains would also allow countries to harness the dividends of the upcoming demographic transition (see Chapter 2).⁹

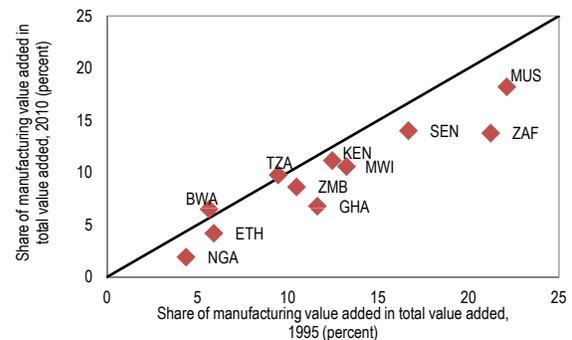
An additional question would be which country or region could serve as an anchor for sub-Saharan Africa's integration into global value chains. Some larger and more advanced economies within the region, most notably South Africa, could be candidates. Alternatively, given growing ties with China and India, including through FDI, these emerging markets could see increasing value in outsourcing some of their economic activities to sub-Saharan Africa, especially as rising wages in the Asian countries could make the region more cost competitive.

In that context, an econometric analysis investigates the policy measures likely to support a stronger

insertion for the region into global value chains. After controlling for the level of development and the size of the economy (as smaller countries tend to be more internationally integrated, all else equal), deeper integration into global value chains—as measured by a higher share of foreign value added in one country's exports—is found to be associated with improved indicators of human capital and availability of credit, while it is hampered by higher tariff levels and difficult business environments (see Annex 3.2, Section 3). More specifically, a reduction in tariff rates across sub-Saharan Africa toward the average prevailing elsewhere in the world could increase the share of foreign value added in exports by about 3 percentage points, an increase in access to credit by 2 percentage points, and an increase in education spending and rule of law to levels seen elsewhere in the world by another 1 percentage point each. While such changes would likely occur

⁹It is worth stressing that integration into global value chains in itself is not a guarantee of higher income as countries participating in portions of the global value chains with low value added can run the risk of being permanently confined to these segments. However, scaling up in the global value chain—that is, increasing the share of foreign value added in one country's exports—is indeed associated with better chances to accelerate structural transformation. The insertion into global value chains can also enhance positive spillovers into the domestic economy through backward linkages, if domestic sectors are competitive enough to contribute into the value chain. For instance, in vertical backward linkages that integrate local suppliers into production processes of global value chain firms, these domestic suppliers can also benefit from knowledge and technology spillovers (Javorcik and Spatareanu 2008).

Figure 3.17. Sub-Saharan Africa: Share of Manufacturing in the Economy, 2010 versus 1995



Sources: Groningen Growth and Development Center database (Timmer, de Vries, and de Vries 2014); and IMF staff calculations. Note: See page 70 for country acronyms.

over time, together they would bring the depth of integration of the region to levels currently seen in other low-income and emerging markets. This suggests that actions on these policy levers would go a long way toward positioning the region well to participate in global value chains.

CONCLUSIONS

The region has experienced a formidable expansion of its trade flows over the last 20 years, helping propel its growth engine. Strong demand for commodities has undeniably played a role in supporting the increase in trade, in particular with emerging markets, but it is far from the entire story, as even non-oil commodity exporters have managed to diversify their export structure, and begun to integrate into value chains.

Nonetheless, the current global environment—a slowing China, anemic growth in Europe, faltering commodity prices, and the risks of global financial volatility as some advanced economies normalize monetary policy conditions—will be more challenging than in the recent past. This environment provides a unique opportunity to refocus policies on economic diversification and on fostering structural transformation. Further and better integration into global trade can provide

such an opportunity. Despite the strong growth in trade flows, sub-Saharan Africa still trades below its potential, both in terms of total flows and of positioning in global value chains. Some countries have started to leverage their comparative advantages, either in agriculture and agro-business, or, in some cases, in manufacturing. But more broadly, much more could be done to arrest the gradual deindustrialization in the region.

Addressing the barriers to trade could therefore unlock untapped productivity gains, bringing with it more jobs, higher income levels, more diversified economies, and eventually more sustainable growth. Supporting the development of regional trade flows would also better shelter the region from exogenous external shocks. Insufficient infrastructure comes out as one of the most important impediments to trade flows. But lower tariffs, better access to credit for the private sector, and a more conducive business climate are all found to support more intense trade flows and a better insertion into global value chains, as well as efforts to improve education outcomes. These are levers over which the authorities have control, and on which they have started to work. The efforts should be sustained and even accelerated to leverage the region's remarkable assets, including sound macroeconomic policies, improving economic institutions, and a young and growing workforce.

Annex 3.1. Recent Trends in Regional Financial Integration in Sub-Saharan Africa

Increasing Regional Foreign Direct Investment

While foreign direct investment (FDI) from outside the continent remains dominant, intraregional FDI is increasing, with the share of announced cross-border greenfield investment projects—the major investment type in sub-Saharan Africa—originating from within Africa rising to 18 percent in 2009–13 from less than 10 percent in 2003–08 (UNCTAD 2014). In addition, a distinctive feature of FDI integration in sub-Saharan Africa is its noticeable subregional orientation (Figure 3.1.1).

Unlike FDI inflows originating from outside the continent, almost all (97 percent) of intra-Africa investment is concentrated in manufacturing and services. In the Economic Community of West African States (ECOWAS) and East African Community (EAC), intraregional FDI in these sectors represents about 36 percent of all investments. While information on the type of FDI inflows is not readily available, it is believed that flows to the banking sector are an important share of services FDI, particularly in the ECOWAS area where the banking sectors of Nigeria and Togo have expanded rapidly through a network of subsidiaries (Beck and others 2014; IMF 2015a). For many smaller, often landlocked or non-oil-exporting countries in sub-Saharan Africa, intraregional FDI is a significant source of foreign capital. For example, over 2010–12, investments from other African countries represented at least 30 percent of FDI stocks in Benin, Burkina Faso, Guinea-Bissau, Lesotho, Rwanda, and Togo (UNCTAD 2014).

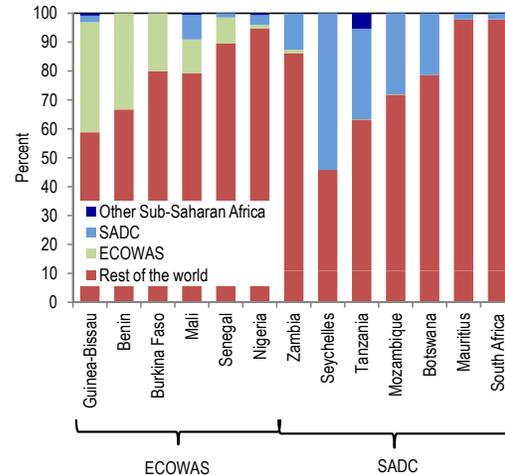
Developing Regional Financial Infrastructure

Several sub-Saharan African countries have made progress in updating their regulation and supervision system with a view to moving toward an integrated approach at the regional level. SWIFT data highlight the critical role played by financial infrastructure in promoting intraregional trade, with higher intraregional trade in the WAEMU reflecting more developed regional financial infrastructure (SWIFT 2013). The EAC countries are undertaking systematic efforts to harmonize prudential supervisory rules and practices (Beck and others 2014). In addition, the SADC, COMESA, WAEMU, and CEMAC have made progress in harmonizing their payment systems.¹ As a result, cross-border payment systems are being increasingly used to facilitate remittances, reduce transaction costs, and promote intraregional trade.

Emerging Regional Bond Markets

Except for South Africa, bond markets in sub-Saharan African countries are still at a nascent stage of development,

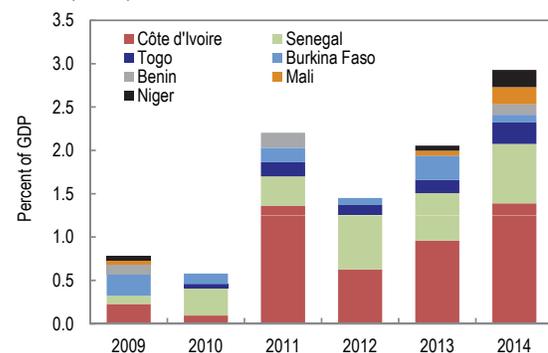
Figure 3.1.1. Selected Sub-Saharan African Countries: Origin of Inward Foreign Direct Investment, 2012



Sources: IMF, Coordinated Direct Investment Survey; and IMF staff calculations.

Note: See footnote 1 for an explanation of acronyms.

Figure 3.1.2. WAEMU: Primary Issuances on the Regional Bond Market (BRVM)



Sources: Central Bank of Western African States (BCEAO); and IMF staff calculations.

Note: With the exception of two small issuances in 2010–11 by state-owned enterprises in Côte d'Ivoire and Benin, all issuances reported here are sovereign issuances. WAEMU = West African Economic and Monetary Union.

This annex was prepared by Rahul Anand, Jorge Iván Canales Kriljenko, and Daniela Marchettini.

¹ Regional groups include the Economic and Monetary Community of Central Africa (CEMAC); Common Market for Eastern and Southern Africa (COMESA); Southern African Development Community (SADC); and the West African Economic and Monetary Union (WAEMU).

both in terms of size and liquidity. Building a regional market is one way to overcome the challenges posed by the small size of an individual country's financial system. It might also lead to an expansion in the investor base, technology transfer, and other scale efficiencies, allowing for an overall reduction in transaction costs.

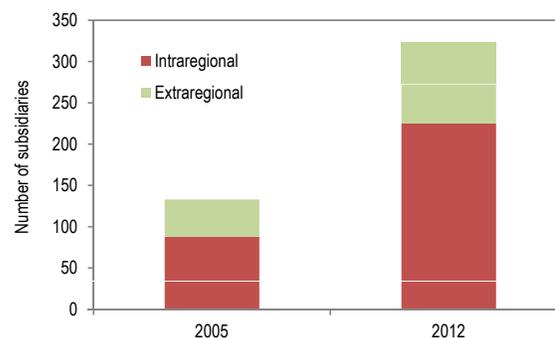
Several efforts are underway to develop regional markets in sub-Saharan Africa. The WAEMU authorities established a regional market (BRVM) in 1999, followed by the establishment of a regional market (BVMAC) by the CEMAC. Elsewhere, both ECOWAS and the EAC are progressing toward greater regional integration of capital markets. For example, within ECOWAS, stock exchanges of Ghana, Nigeria, Sierra Leone, and the BRVM are working on integrating their markets. COMESA also intends to create a single financial services market.

WAEMU is the most developed sub-Saharan Africa regional bond market, benefiting from the region's economic and monetary integration and regional institutions for financial surveillance, trade, and settlement. Local bond issuance in the primary market has increased considerably, though market capitalization remains low, dominated by government debt (Figure 3.1.2). Regional integration has also contributed to an increased diversification of issuers and maturities. In 2014, all WAEMU countries issued in the regional bond market, with the exception of Guinea Bissau; and current issuances covered almost all the points on the yield curve in the 3- to 10-year range.

Growing Cross-Border Banking

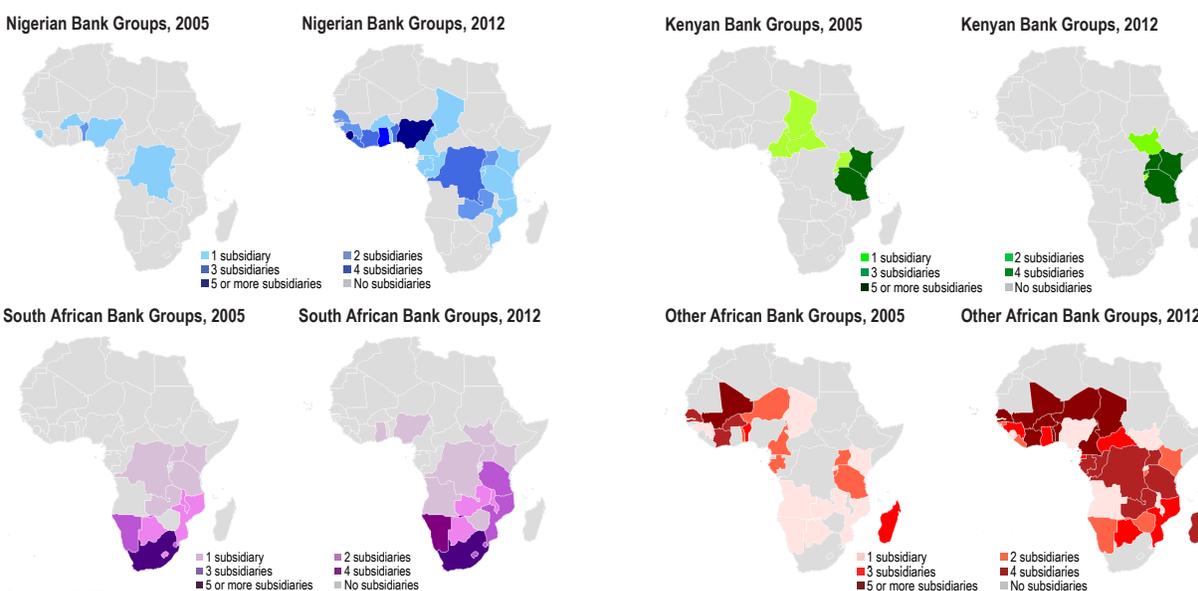
Cross-border banking has also been an important channel of regional financial integration in sub-Saharan Africa, with the number of foreign subsidiaries operating in the region more than doubling between 2005 and 2012 (Figure 3.1.3). Moreover, pan-African banking groups' subsidiaries have grown much faster than subsidiaries from non-sub-Saharan African banks. Pan-African banking groups originate mostly in Nigeria and South Africa and to a lesser extent in Kenya (Beck and others 2014; IMF 2015c), with Ecobank, located in Togo with 36 subsidiaries, being the most widespread pan-African bank (Figure 3.1.4). Acquisition of existing firms, rather than greenfield investments, has been the dominant mode of expansion of the number of subsidiaries.

Figure 3.1.3. Sub-Saharan Africa: Cross-Border Banking, 2005 and 2012



Sources: IMF (2015c); and IMF staff calculations.

Figure 3.1.4. Sub-Saharan Africa: Reach of Pan-African Banks, 2005 and 2012.



Annex 3.2.

Description of Econometric Models Used and List of Country Groups

1. Trade Openness and Growth

The estimation is based on a balanced panel dataset, which includes 42 countries—Eritrea, Seychelles, and South Sudan were not included due to lack of data—and six periods of five years each, starting in 1980, 1985, 1990, 1995, 2000, and 2005. The estimation method is three-stage least squares (3SLS).¹ The rate of growth of real per capita GDP is the dependent variable. Following the relevant literature, this variable is assumed to be determined by two endogenous determinants, the ratios of total investment and consumption to GDP, and exogenous variables, such as the initial level of GDP per capita, trade openness (defined as the sum of exports and imports in percent of GDP) and the change in terms of trade (Table 3.2.1). We use lagged values of trade openness in each period to address endogeneity issues and consider the terms of trade to be exogenously determined by international markets. These two variables also serve as instruments for the endogenous variables, together with the following additional instruments; the initial values at each five-year period of the cost of investment; government consumption as share of GDP; the five-year period average values of the indicator of political liberty, young and elderly dependency rates, population density, urbanization, life expectancy; and additional indicators of country area and years of primary and secondary education. Dummies are included to account for landlocked countries and periods of war. The use of periods of five years helps reduce the problem of likely serially correlated transitory components in the disturbance term and the need for year fixed effects. The specification tests suggest that the set of instruments is valid and the equation is identified.

Table 3.2.1. Trade Openness and Growth Model Results

Initial GDP level	-0.81 ***
Trade openness	0.63 **
Terms of trade	0.50 ***
Investment	2.34 **
Consumption	-2.25 ***
Number of observations	252
Time fixed effects	No
Country fixed effects	Yes
R-squared	0.44

Source: IMF staff calculations.

Note: ** indicates significance at 5 percent, and *** at 1 percent.

2. Gravity Model

To evaluate the influence of geographical, institutional, and policy-related factors on bilateral trade flows, we estimate gravity equations using the IMF's Direction of Trade Statistics (DOTS) database. Our sample covers 167 countries for the 1980–2013 period. While the DOTS database lacks data on services trade, it provides the most extensive panel dataset of worldwide bilateral trade flows currently available. Our empirical specifications can be summarized in the following gravity equation:

$$\ln x_{ijt} = a^{Ex} M_{it-1}^{Ex} + a^{Im} M_{jt-1}^{Im} + \theta D_{ijt-1} + a_t + u_{ijt}.$$

In this equation, x_{ijt} , the exports from exporting country i to importing country j in year t , are conditioned on M_{it-1}^{Ex} and M_{jt-1}^{Im} , which denote the vectors of the attributes of exporter i and importer j in the year before, and a_t , a year fixed effect. Factors that affect trade costs between i and j are represented by D_{ijt-1} and u_{ijt} denotes the unobserved bilateral trade cost determinants. One-year lagged values of the regressors are used to avoid simultaneity bias.

¹We thank Mark Schaffer for sharing his 3SLS estimation code.

Table 3.2.2 Gravity Model Estimates

	(1)	(2)	(3)	(4)	(5)
	ln (Exports)				
Exporter ln (population) (lag1)	1.063*** (0.008)	1.043*** (0.008)	1.042*** (0.008)	1.059*** (0.008)	1.319*** (0.012)
Importer ln (population) (lag1)	0.966*** (0.008)	0.981*** (0.008)	0.980*** (0.008)	0.962*** (0.008)	1.087*** (0.012)
Exporter ln (GDP per capita) (lag1)	0.946*** (0.011)	0.854*** (0.013)	0.854*** (0.013)	0.907*** (0.012)	0.827*** (0.023)
Importer ln (GDP per capita)	0.703*** (0.010)	0.712*** (0.011)	0.712*** (0.011)	0.665*** (0.011)	0.651*** (0.021)
Log of distance (lag1)	-1.393*** (0.016)	-1.374*** (0.024)	-1.360*** (0.024)	-1.368*** (0.017)	-1.398*** (0.021)
Common official language (lag1)	0.498*** (0.065)	0.554*** (0.063)	0.561*** (0.063)	0.482*** (0.064)	0.474*** (0.096)
Common language (lag1)	0.337*** (0.066)	0.497*** (0.064)	0.486*** (0.064)	0.515*** (0.065)	0.521*** (0.099)
Common colonizer (lag1)	0.579*** (0.054)	0.690*** (0.054)	0.676*** (0.054)	0.632*** (0.053)	0.674*** (0.084)
Exporter landlocked (lag1)	-0.756*** (0.038)	-0.562*** (0.037)	-0.565*** (0.037)	-0.651*** (0.037)	-0.631*** (0.056)
Importer landlocked (lag1)	-0.811*** (0.037)	-0.785*** (0.035)	-0.787*** (0.035)	-0.735*** (0.036)	-0.758*** (0.051)
Both Asia and Pacific (lag1)		1.889*** (0.109)	1.963*** (0.110)		
Both Europe (lag1)		1.672*** (0.089)	1.758*** (0.092)		
Both Middle East and Central Asia (lag1)		0.006 (0.110)	0.091 (0.112)		
Both North and Latin America (lag1)		1.071*** (0.092)	1.151*** (0.094)		
Both CEMAC (lag1)			0.508 (0.373)		
Both EAC (lag1)			1.607*** (0.419)		
Both SACU (lag1)			-0.061 (0.536)		
Both WAEMU (lag1)			1.097*** (0.290)		
Both sub-Saharan Africa (lag1)				-0.328*** (0.072)	
None sub-Saharan Africa (lag1)				0.727*** (0.033)	
Exporter rule of law (lag 1)					0.364*** (0.037)
Importer rule of law (lag1)					0.153*** (0.035)
Exporter infrastructure (lag1)					0.226*** (0.021)
Importer infrastructure (lag1)					0.165*** (0.021)
Exporter ln (tariff) (lag1)					-0.112*** (0.010)
Importer ln (tariff) (lag1)					-0.057*** (0.011)
Exporter ln (domestic credit) (lag1)					0.302*** (0.033)
Importer ln (domestic credit) (lag1)					0.187*** (0.029)
Observations	484595	484595	484595	484595	54997
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No	No
R-Squared	0.624	0.6352	0.6355	0.6244	0.7271

Source: IMF staff calculations.

Note: Robust standard errors are shown in parentheses. * indicates significance at 10 percent, ** at 5 percent, and *** at 1 percent.

Table 3.2.2 shows the gravity equation estimates of the determinants of bilateral trade patterns. Column 1 indicates that exporter and importer attributes such as size (population) and development (GDP per capita), as well as trade cost measures (bilateral distances, common language dummies, common colonizer dummies, and dummies representing landlocked countries) matter for bilateral trade and come out with the expected sign.²

Column 2 allows for intraregional bilateral trade comparisons across regions. We use the group of sub-Saharan African countries as the comparison group to which bilateral trade flows of other regions are compared.³ The results suggest that after controlling for size, level of development, and geographical and cultural features, bilateral trade between sub-Saharan African countries is found to be lower compared with trade between countries belonging to the Asian, European, and American regions by 85 percent, 80 percent, and 65 percent, respectively.

Column 3 allows for intraregional comparisons between sub-Saharan African countries that have formed monetary and trading unions and those that have not. All else equal, trade between EAC and WAEMU partners is found to be five times and three times, respectively, higher relative to other trade flows within sub-Saharan Africa.

Column 4 uses as the baseline comparison group the group in which either the exporter or the importer is a sub-Saharan African country. The estimates suggest that, all else equal, intraregional trade within sub-Saharan Africa is lower by 40 percent relative to cross-regional trade that sub-Saharan African countries engage in with partners from other regions. In addition, trade between sub-Saharan African countries and the rest of the world tends to be 50 percent of the trade that takes place between countries outside the region.

Column 5 additionally includes estimates for institutional and policy-related variables that are consistent with the hypothesis that improved rule of law and infrastructure quality are significantly and positively correlated with trade.⁴ Bilateral trade, overall, is higher between countries with lower tariffs and more credit availability. The values of these variables for the region and the rest of the world are presented in Table 3.2.3.⁵

Table 3.2.3. Determinants of Trade: Sub-Saharan Africa and the Rest of the World

	Sub-Saharan Africa	Rest of the World
Tariffs	7.1	1.6
Infrastructure	2.8	4.6
Rule of law	-0.5	0.5
Domestic credit	24.1	68.8

Sources: IMF, World Economic Outlook database; and World Economic Forum.

² Common language dummies indicate whether the pair of trading partners shares a common official language or a language that is spoken by at least 9 percent of the population in both countries (Mayer and Zignago 2011).

³ Cross-regional trading dummies are included, but not shown, in the specifications of columns 2 and 3. Standard errors are clustered at the country pair level.

⁴ Law enforcement and infrastructure quality indicators are taken from the Global Competitiveness Indicators database provided by the World Economic Forum.

⁵ Tariffs are computed as the averages of effectively applied rates weighted by the product import shares corresponding to each partner country. Credit availability refers to domestic credit provided by the financial sector in percent of GDP. Both variables were obtained from the World Development Indicators database from the World Bank.

3. Insertion in Global Value Chains

We conduct the estimation on an unbalanced panel for 185 countries and the period between 2007 and 2011. The estimation method is a simple ordinary least squares (OLS) including years and country fixed effects. The dependent variable is a country's degree of backward integration, that is, the share of the foreign value added in total exports. We control for the size of the country, measured by GDP, as smaller countries tend to have higher backward integration, all else equal. Also, owing to the nonlinear relationship between backward integration and income per capita, we include as control variables the GDP per capita as well as the same term in squared terms to capture the negative portion of the relationship. For policy variables, we include domestic credit provided by the financial sector as a share of GDP, spending on education as a share of GDP, the quality of infrastructure, the weighted average of tariff rates applied to all products in a given country and year, and a measure of the rule of law (see footnotes 4 and 5 of this annex for a description of these variables). All variables, with the exception of index variables, are in logs and are lagged by one year to avoid simultaneity bias. As a robustness check, we also run a separate regression using the subsample of countries with GDP per capita at or below U.S.\$22,000, thus capturing only the portion in which backward integration and income levels are positively related. The variables show similar magnitudes and levels of statistical significance (Table 3.2.4).

Table 3.2.4. Panel Regression of Backward Integration and Policy Variables

	Dependent Variable: Backward Integration as Share of Total Exports	
	(1) Entire Sample	(2) GDP per Capita < \$22,000
Real GDP per capita (lag1)	0.326** (0.161)	-0.085* (0.047)
Real GDP per capita ² (lag1)	-0.029** (0.011)	
GDP (lag1)	-0.060*** (0.017)	-0.059*** (0.020)
Domestic credit to private sector (percent of GDP) (lag1)	0.082* (0.043)	0.080 (0.054)
Education (percent of GDP) (lag1)	0.413*** (0.081)	0.349*** (0.082)
Rule of law (lag1)	0.287*** (0.063)	0.328*** (0.063)
Quality of infrastructure (lag1)	0.047 (0.041)	0.063 (0.048)
Tariff_weighted (lag1)	-0.296*** (0.037)	-0.254*** (0.041)
Constant	-2.672*** (0.636)	-1.216*** (0.380)
Number of observations	385	236
Time fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
R-Squared	0.39	0.57

Sources: Eora database; World Economic Forum, Global Competitiveness Index; World Bank, *World Development Indicators*; and IMF staff calculations.

Note: All variables are in natural log, except for rule of law and quality of infrastructure; the independent variables are lagged by one year. Robust standard errors in parentheses; * indicate significance at 10 percent, ** at 5 percent, and *** at 1 percent.

4. Country Groups

Oil-exporters sub-Saharan Africa	Resource-intensive non-oil sub-Saharan Africa	Nonresource-intensive coastal sub-Saharan Africa	Nonresource-intensive landlocked sub-Saharan Africa
Angola, Cameroon, Chad, Republic of the Congo, Equatorial Guinea, Gabon, Nigeria, South Sudan.	Botswana, Burkina Faso, Central African Republic, Democratic Republic of the Congo, Ghana, Guinea, Liberia, Mali, Namibia, Niger, Sierra Leone, South Africa, Tanzania, Zambia, Zimbabwe.	Benin, Cabo Verde, Comoros, Côte d'Ivoire, Eritrea, The Gambia, Guinea-Bissau, Kenya, Madagascar, Mauritius, Mozambique, São Tomé and Príncipe, Senegal, Seychelles, Togo.	Burundi, Ethiopia, Lesotho, Malawi, Rwanda, Swaziland, Uganda.