

Trade Integration and Global Value Chains in Sub-Saharan Africa: In Pursuit of the Missing Link¹

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Abstract

We investigate the extent of trade integration of sub-Saharan African (SSA) countries in the global economy as well as within the region. To assess integration, we use four key concepts: 1) trade openness, 2) the centrality in the global and regional trade network, 3) gravity model estimates, and 4) global value chain (GVC) integration. Using both existing data and a newly available dataset based on multi-region input and output tables, we evaluate these four dimensions of trade integration and assess the degree of integration globally as well as regionally. We find that the region's trade openness has increased strongly since the mid-1990s, reflecting a growing partnership with emerging markets, particularly China, and budding intraregional trade. However, the region's trade flows have barely kept up with the very rapid expansion of global trade. The network analysis shows that the trade centrality of the economies in the region remains relatively low, and has not increased much over the last 20 years. It remains lower than the one observed in other comparable emerging and developing economies, which is further corroborated by gravity model. Likewise, the region still has some way to go to better integrate in global value chains—a feature that has been associated with higher income growth overtime in regions such as South East Asia and Eastern Europe. Some countries are showing progress, albeit from very low starting points, with the EAC and SACU particular bright spots. A better insertion into the global economy would help foster structural transformation, export diversification, and the possibility to absorb technology and skills from abroad.

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1. Introduction

The mid-1990s ushered two decades of strong and sustained growth in sub-Saharan Africa. The growth take-off has been attributed to a combination of factors, not least 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, with sharply lower commodity prices, in particular for oil, and tightening global financial conditions.

We investigate the extent of trade integration of sub-Saharan African (SSA) countries in the global economy as well as within the region. To assess integration, we use four key concepts: 1) trade openness, captured by import and export flows, 2) the centrality in the global and regional trade network, a measure that takes into account not only the size of trade but also the number of trade partners and the respective weight of these trade partners in global trade, 3) gravity model estimates that account for country and regional specific determinants of bilateral trade flows, and 4) global value chain (GVC) integration. Using both existing data and a newly available dataset based on multi-region input and output tables, we are able to evaluate these four important dimensions of trade integration and assess the degree of integration globally as well as regionally. The main findings of the paper 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, in particular for oil-exporting countries. However, the export structure of the rest of the region is less skewed toward raw materials, even for other natural resource exporters.
- 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 in global value chains—a process that has consistently been associated with higher level of activity and income growth over time—as has happened in South East 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 EAC and SACU particular 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, or to a lesser extent, transport, tourism and textile have benefitted 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 non-tariff barriers, and improving the business climate and access to credit, while continuing to enhance education outcomes.

The rest of the paper is organized as follows. In the next section, we document SSA’s international and regional integration over the last 20 years. In section 3, we introduce the concept of centrality in the global and regional trade network, which takes into account, for each country, both the size of its trade and the number of its trade partners and their weight on global trade. To investigate the determinants of trade and estimate the order of magnitude of a potential “trade gap” for sub-Saharan Africa, we use a gravity model approach in section 4, explaining bilateral trade flows with both country and regional specific determinants. Section 5 assesses the extent of SSA’s integration into global supply chains, using the newly created database Eora that provides multi region input output (MRIO) tables. Lastly, section 6 concludes.

2. Trade Openness

Sub-Saharan Africa’s trade experienced a rapid expansion over the last 20 years. While cumulative nominal GDP growth for the region over 1995–2013 amounted to a substantial 350 percent (in U.S. dollars), 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, with the import-to-GDP ratio also increasing, 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.³ China is now the most important single trading partner of sub-Saharan Africa (IMF, 2012 and 2014a). Moreover, the share of

³ A more in-depth analysis of growing trade ties between sub-Saharan Africa and emerging markets is provided in Chapter 3 of the IMF’s October 2011 *Regional Economic Outlook: Sub-Saharan Africa*.

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 1).

[Insert Figure 1 about here]

We conduct a more country-specific analysis that corroborates these findings. We define resource intensive exporters as those for which nonrenewable resources represent 25 percent or more of goods exports over 2009-12. By dividing SSA countries into groups of oil exporters versus resource intensive non-oil exporters, and coastal non-resource intensive exporters versus landlocked non-resource intensive exporters, Figure 2 depicts the changes in export shares between 1995 and 2013. *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' interest for commodities. Conversely, export shares in most *long-time commodity exporters*, such as Angola, Equatorial Guinea, or Zambia, have declined over time—underscoring the difficulty to broaden the export base in countries with a longtime role of commodities. Moreover, in many countries, rapid GDP growth has been accompanied by the development of buoyant non tradable 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. As for *regional trade*, countries such as Côte d'Ivoire, Togo, and Senegal in the WAEMU stand out for increased regional trade integration, and Botswana, Lesotho, Namibia, and Swaziland in the SACU. On the other hand, *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.

[Insert Figure 2 about here]

The strong increase in the region's exports has 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 have 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 two-point-fivefold 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). This led to a welcome increase in purchasing power for the region, and helped finance a much-needed stepping up in infrastructure investments (IMF 2014b). 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 and strong demand from emerging markets. Unfortunately, this leaves the region's commodity exporters particularly exposed to reversal in prices.

[Insert Figure 3 about here]

Once again, this overall picture masks substantial heterogeneity in the structure of exports across the region (Figure 4). 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 and low-income countries elsewhere in the world.

[Insert Figure 4 about here]

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 5). 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 from non resource 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.

[Insert Figure 5 about here]

3. Centrality in the global and regional trade network

Sub-Saharan Africa's overall progress in trade integration, however, 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 entry in 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 in global trade which we now turn to—its centrality in the global trade network—paints a similar picture. This measure not only takes into account 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).

The centrality measure is estimated here using the PageRank algorithm created by Brin and Page (1998). The centrality score of each exporting country is computed as the probability that they are chosen in the trading network by an importing country. The PageRank algorithm treats the trading network as a stationary distribution of a random walk defined on a set of trading countries. The random walk tracks a randomly chosen importer with probability p at each step, and with probability $1 - p$, the walk starts afresh from an exporter chosen at random according to a uniform distribution. More specifically, the centrality values satisfy the following equation:

$$C(i) = p \sum_{j \rightarrow i} \left[\frac{1}{d_j} C(j) \right] + \frac{1-p}{N}, \text{ for } i = 1, \dots, N$$

where $C(i)$ is the centrality of country i , d_j is the number of countries that country i is exporting to, and p represents the probability of exporting to a country when abandoning the random walk. The sum in the first term on the right hand side of the equation above is taken over all those countries j that are importing from country i . The centrality is then calculated using an iterative algorithm that corresponds to the principal eigenvector of the normalized bilateral trade matrix. By construction, the sum of $C(i)$ for all countries considered in the network is one.

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 and developing economies (Figure 6). 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 of trade in sub-Saharan African economies.

[Insert Figure 6 about here]

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, although from a low base of 2 percent of GDP to 3½ percent of GDP. Measuring centrality at the intra-regional level reveals the emergence of trade sub-regions, 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 7).

[Insert Figure 7 about here]

4. Gravity Model

In order to assess the underlying factors that drive trade integration and estimate the order of magnitude of a potential “trade gap” for sub-Saharan Africa, we use a gravity model approach. 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 trade flows to these very characteristics of the trading countries (Head and Mayer 2013).

We do so 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 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, the exports from exporting country i to importing country j in year t , x_{ijt} , 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 year $t - 1$. 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. To avoid potential biases from reverse and simultaneous causation, we condition on the one-year lagged values of the regressors and we control for global common shocks by including a year fixed-effect, a_t .

Table 1 shows the gravity equation estimates of the determinants of bilateral trade patterns. The standard errors reported in the regressions are robust and clustered at the country pair level to account for bilateral trade correlation across time and to allow for different variance across the pairs.

[Insert Table 1 about here]

Column 1 controls for 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).⁴ In order to perform intraregional bilateral trade comparisons across regions, we use the group of sub-Saharan African countries as the comparison group in Column 2 and introduce regional dummies for regional trade occurring within other regions.⁵ Similarly, Column 3 allows for intraregional comparisons between sub-Saharan African countries that have formed monetary and trading unions and those that have not. In order to compare trade flows emanating from sub-Saharan Africa to trade occurring elsewhere in the world, in Column 4, we use as the baseline comparison group the group in which either the exporter or the importer is a sub-Saharan African country, and introduce dummies for trade flows where none of the trade partners are from sub-Saharan Africa (for completeness, we also account via a second dummy for sub-Saharan Africa’s intraregional trade). Column 5 additionally includes estimates for institutional and policy-related variables.⁶ The average values of these institutional and policy-related variables for sub-Saharan African countries and the rest of the countries in our sample are provided in Table 2.

[Insert Table 2 about here]

The overall analysis suggests that exports and imports from sub-Saharan Africa are significantly lower than trade flows elsewhere in the world. Of course, 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, as accounted for in the determinants of the gravity model equation. But even after accounting for these, the dummy for trade occurring elsewhere in the world in Column 4 of Table 1 still comes out significant. More specifically, Column 4’s estimation suggests that bilateral trade flows from sub-Saharan Africa tend to be on average 50 percent lower than trade flows elsewhere in the world, even after accounting for economic and other determinants (Figure 8). Likewise, the dummies for trade occurring in other regions in Column 2 are also significant with the exceptions of the “Middle East and Central Asia”, suggesting that sub-Saharan-African regional trade is much smaller than regional trade in most other regions in the world—85 percent lower than in

⁴ 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).

⁵ Cross-regional trading dummies are included, but not shown, in the specifications of columns 2 and 3.

⁶ The rule of law and infrastructure quality indicators are taken from the Global Competitiveness Indicators database provided by the World Economic Forum. 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.

South and East Asia, 80 percent lower than in Europe and 65 percent lower than in Northern and Latin America.⁷ It is noteworthy that sub-Saharan African regional trade exhibits such substantial gaps despite the existence of numerous intraregional trade agreements—possibly because their overlapping groupings greatly reduce their effectiveness.

[Insert Figure 8 about here]

What explains these substantial gaps? To shed light on that question, the gravity model described previously is augmented in Column 5 of Table 1 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 others 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 50 percent lower in the region than elsewhere in the world, credit-to-GDP ratios about 25 percent lower, and tariffs on average 4 times higher than elsewhere (Figure 9). More specifically:

[Insert Figure 9 about here]

- Infrastructure appears as the most important impediment to trade for the region. In fact, bringing infrastructure to the average level of quality at the global level 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 effort is currently underway in the region (as elaborated in Chapter 3 of the IMF’s 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 non-tariff impediments to trade—export taxes and duties, but also corruption, regulatory requirements, and delays 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,

⁷ Unrecorded 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.

however, to be accompanied with adequate macro-prudential frameworks to carefully manage the corresponding risks (IMF 2012).

- Finally, continuing to work toward lowering tariffs in the region would further support the development of both international and regional trade. On average, 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 be accompanied by 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 in Column 3 of Table 1: 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 CEMAC, where intra-currency union trade flows are not found to be significantly higher than regional flows outside the currency union.

5. 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 (GVC). 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 been 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 South East Asia around Japan and China and in Eastern Europe around Germany (IMF 2013 and 2015; Chapter 3 of IMF 2014a; and IMF 2014b).

For countries with limited existing manufacturing or service export basis and a large pool of labor such as in those in sub-Saharan Africa, this development can provide a golden opportunity. By specializing on a specific segment of a production chain, each participating country can generate a portion of the goods or services' value added—while producing the whole product from scratch would never have been within reach in an increasingly competitive world—even if that means that a lower share of the value added of exports is captured locally. While certain preconditions such as sufficient levels of capacity, quality and efficiency are required to join global value chains (Baldwin 2011; WTO 2014), these threshold levels can be exceeded over time through technology and knowledge transfers from other countries—most often in the form of foreign direct investment (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.

To measure a country's extent of international integration in GVCs, it is necessary to know the sources and destinations of the value added embodied in the products. A budding literature on trade in value added has emerged that relies on data using inter-country input-output (IO) tables. Until very recently, the coverage on sub-Saharan African countries in input-output tables was sparse. We use here the newly created EORA database, which provides global multi-region IO tables, to derive value-added trade for 189 countries from 1990 to 2012 (Lenzen, and others 2012, and Lenzen, and others 2013). The main advantage of using EORA is the depth of its coverage, in terms of countries (189), industries (about 16,000) and years (23 years), virtually unmatched by any 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, however, that some missing data in the IO tables are filled through optimization procedures using 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:⁸

- **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.

The sum of the last two components correspond to the total value added that is created domestically (DVA), and contributes toward its GDP. The sum of FVA and DVA results in the total value of gross exports.

⁸ For the numerical calculations, we follow the mathematical calculations as described in UNCTAD, 2014, p. 26-29.

The integration into global value chains has indeed gone hand in hand with a pick-up in income levels. In particular, we focus on the measure of backward integration, i.e., the foreign value added that is imported for further processing into exports. By this measure, rising backward integration has been associated with rising income over time for developing and emerging economies (Figure 9a). In pursuing a strategy of development anchored around the integration in one intermediary link of the value chains, many countries have managed to lift their income levels as they gradually acquired new capabilities, benefitted 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.⁹

[Insert Figure 10a and 10b about here]

Where do sub-Saharan African countries stand in that landscape? Using the EORA Multi-regional Input-Output database mentioned earlier, we can provide here 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 into global value chains, having also relatively lower income levels than other regions in the world (Figure 10b). 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 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—signaling that the region has yet to join this global momentum and take advantage of it to lift productivity and create jobs (Figure 11). 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 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.

[Insert Figure 11 about here]

⁹ For instance, Maertens et al. (2011) finds 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.

There is, however, a significant degree of heterogeneity across sub-Saharan African countries, with some countries having fared much better than others (Figure 12):

- Oil exporters are the least integrated in global value chains in terms of 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 13). 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 in value chains can happen even in countries where commodities play a role.
- Among the best performers, progress within the East African Community (EAC) has been particularly strong, with Kenya, Tanzania and Uganda exhibiting solid progress—also a reflection of the benefits of the more general economic integration at play among these countries and their stated intention to further deepen their economic and monetary ties (IMF 2015c; Sutton 2012). Likewise, the SACU region exhibits relatively stronger depth of integration, both because its smaller members (Botswana, Lesotho, Namibia, 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 low depth of 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 with the currency union does not reflect the emergence of a regional value chain, but rather 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.
- 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 14). In these countries, the sectors that have benefitted the most from the deepening of integration include agriculture and agro-business (especially in Ethiopia and Seychelles), and manufacturing (particularly in Tanzania), but also textile, 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 textile—in which sub-Saharan Africa has potential to leverage its comparative advantages.

- 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 15). 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.

[Insert Figure 12 about here]

[Insert Figure 13 about here]

[Insert Figure 14 about here]

[Insert Figure 15 about here]

The upshot is that the region still has an enormous potential to integrate into global value chains. By leveraging this potential, a better insertion in 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 relatively small domestic markets, such as many in sub-Saharan Africa; in addition, the enabling of strong job creation would also allow countries to harness the dividends of the upcoming demographic transition (see IMF, 2015).¹⁰

An additional question would be which country or region could serve as an anchor to the 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.

¹⁰ It is worth stressing that integration in 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 run the risk of being permanently confined to these segments. However, scaling up in the global value chain—this 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 integrates local suppliers into production processes of global value chain firms, these domestic suppliers can benefit from knowledge and technology spillovers (Javorcik and Spatareanu 2008).

In that context, an econometric analysis investigates the policy measures likely to support a stronger insertion for the region into global value chains. We mimic the gravity equation in the previous section in terms of the control variables, but instead of bilateral trade, we use backward integration as the dependent variable:

$$\ln FVA_{it} = \beta_1 + \beta_2 X_{t-1} + \gamma_i + \theta_t + \varepsilon_{it},$$

where FVA_{it} is the share of foreign value added in country i 's exports in year t , X_{t-1} are control variables. For the latter, we use GDP per capita as well as the same term in squared term to capture the negative portion of the relationship. For policy variables, we include domestic credit provided by financial sector as share of GDP, spending on education as share of GDP, quality of infrastructure, and the weighted average of tariff rates applied to all products in a given country and year, and lastly a measure on the rule of law. All variables, with the exception of index variables, are in logs to eliminate potential outliers and they are lagged by one year to avoid simultaneity bias. Moreover, we control for time, θ_t , and country, γ_i , fixed effects. As robustness check, we also run a separate regression using the subsample of countries and year with only \$22,000 GDP per capita, thus, capturing only the portion in which backward integration and income levels are positively related, as evidenced in Figure 9a. The variables show similar magnitudes and levels of statistical significance.

We conduct the estimation on an unbalanced panel for 185 countries and over the period 2007-11. 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 in 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, while it is hampered by higher tariff levels and difficult business environments (Table 3). More specifically, a reduction in tariff rates across sub-Saharan Africa toward the average prevailing in non-sub-Saharan African countries 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 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 to positioning the region well to participate in global value chains.

[Insert Table 3 about here]

6. Conclusion

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 fledglingly integrate in 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, however, 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. Yet, 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. The need to improve 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. Those are levers on which the authorities have control, and have started to work on. 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.

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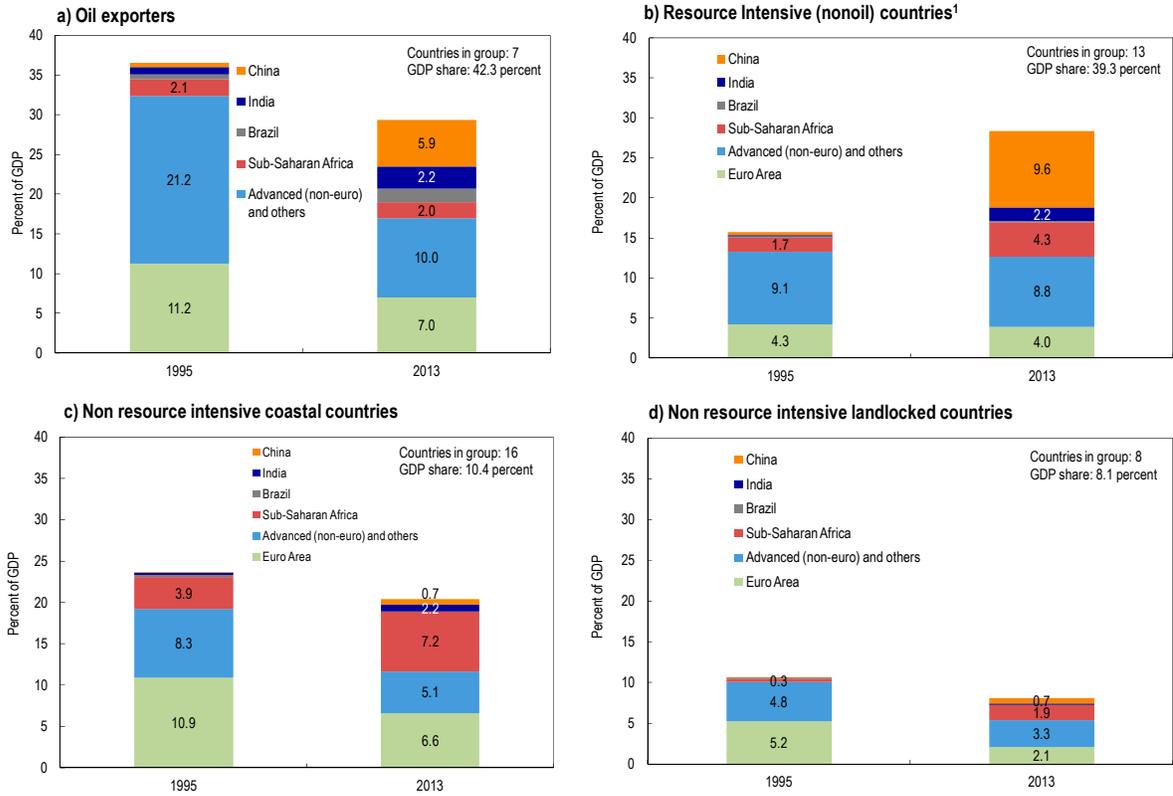
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Figures and Tables

Figure 1. Sub-Saharan Africa: Exports of Goods Shares by Partner, 1995-2013

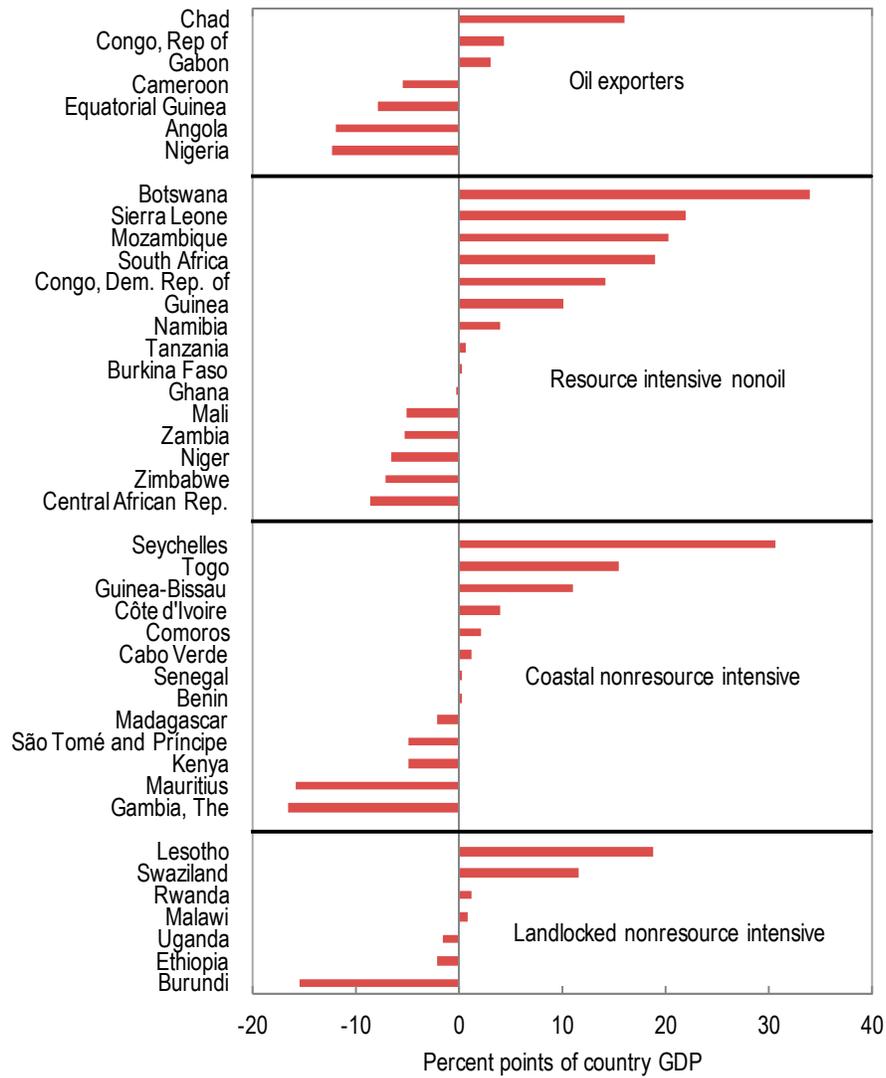


Source: IMF, Direction of Trade Statistics.

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

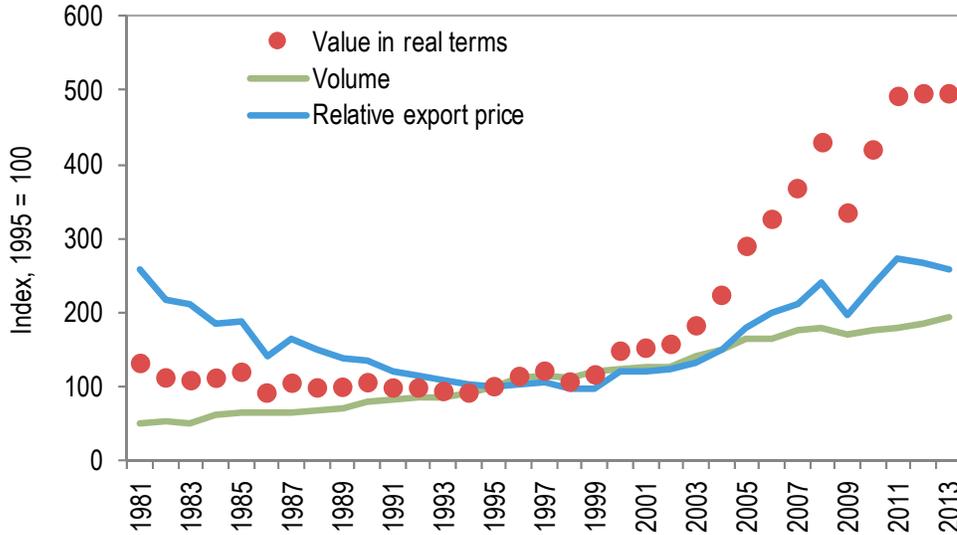
¹Resource intensive countries are defined as those for which nonrenewable resource exports are 25 percent or more of goods exports.

Figure 2. Sub-Saharan Africa: Change in Export Shares, 1995 - 2013



Source: IMF, Direction of Trade; and IMF, World Economic Outlook.

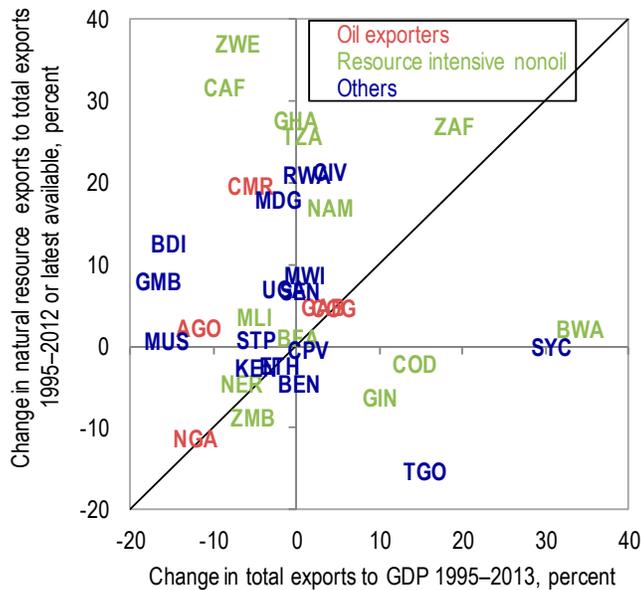
Figure 3. Sub-Saharan Africa: Real Export Value Decomposition: 1981 - 2013¹



Source: IMF, World Economic Outlook database and staff calculations.

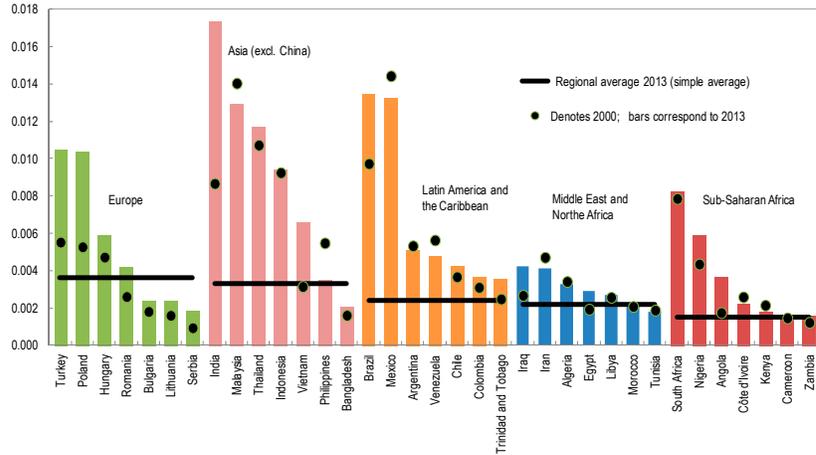
¹ The export value corresponds to the U.S. dollar value of exports deflated by the U.S. GDP deflator. The volume refers to the real exports from the national accounts for each of the sub-Saharan African countries aggregated by their nominal value in 2006. The relative export price is the ratio of the real export value by the export volume.

Figure 4. Sub-Saharan Africa: Change in Export Shares, 1995 - 2013



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

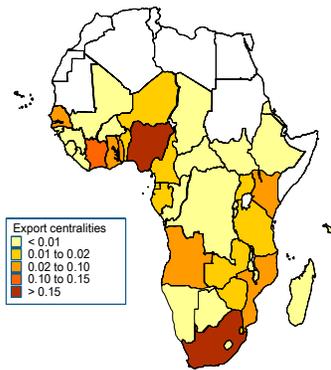
Figure 5. World Centrality per Region, 2000 - 2013¹



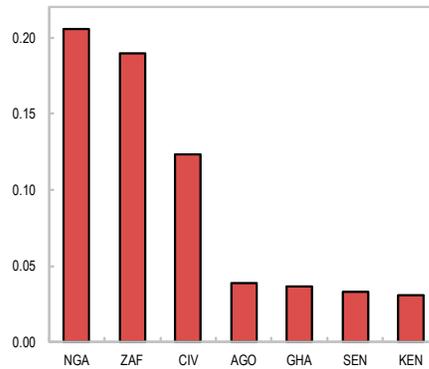
Source: Staff calculations based on data from IMF, Direction of trade.
 Notes: Only emerging and developing countries with 2013 GDP per capita below 20,000 U.S. dollars from each region are considered. China is excluded from the Asia group as its centrality measure is about 28 times higher than the average for that region and five times the second largest centrality measure, corresponding to India.
¹This measure is the PageRank centrality and takes into account the size of trade for any given country, and also 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).

Figure 6. Sub-Saharan Africa: Regional Centrality, 2013

a) Regional Centrality Ranking (2013)

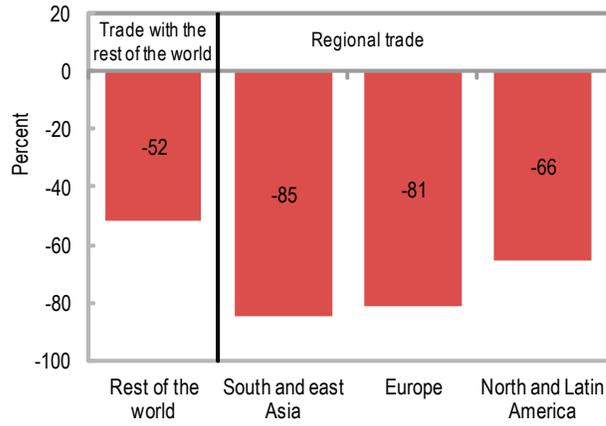


b) Regional Centrality Ranking



Source: Staff calculation based on data from DOTS.

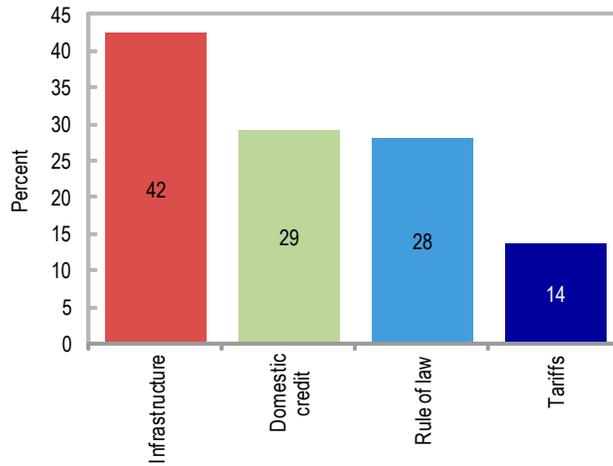
Figure 7. Sub-Saharan Africa: Trade Flows Compared with Other Regions¹



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

¹ Sub-Saharan Africa trade compared with trade of other regions, after controlling for size, level of development, cultural ties, and geographical conditions.

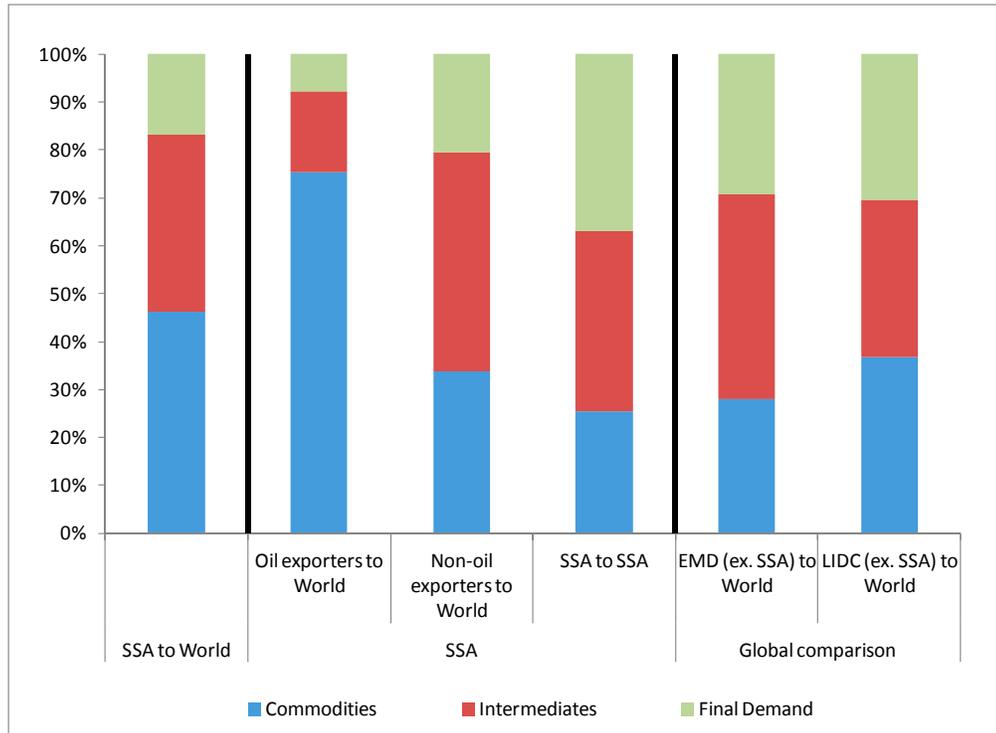
Figure 8. Sub-Saharan Africa: Potential Increase in Trade¹



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

¹ 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.

Figure 9. Goods and Services Export Compositions, average 2008-2012



Source: Eora database and IMF staff estimates.

Note: EMD and LIDC are WEO aggregations. SSA Oil exporters include Angola, Cameroon, Chad, Republic of Congo, Equatorial Guinea, Gabon, Nigeria, and South Sudan.

Figure 10a. Sub-Saharan Africa: Depth of Integration in Global Value Chains and Real GDP per Capita, Average 1991–95 and 2008–12

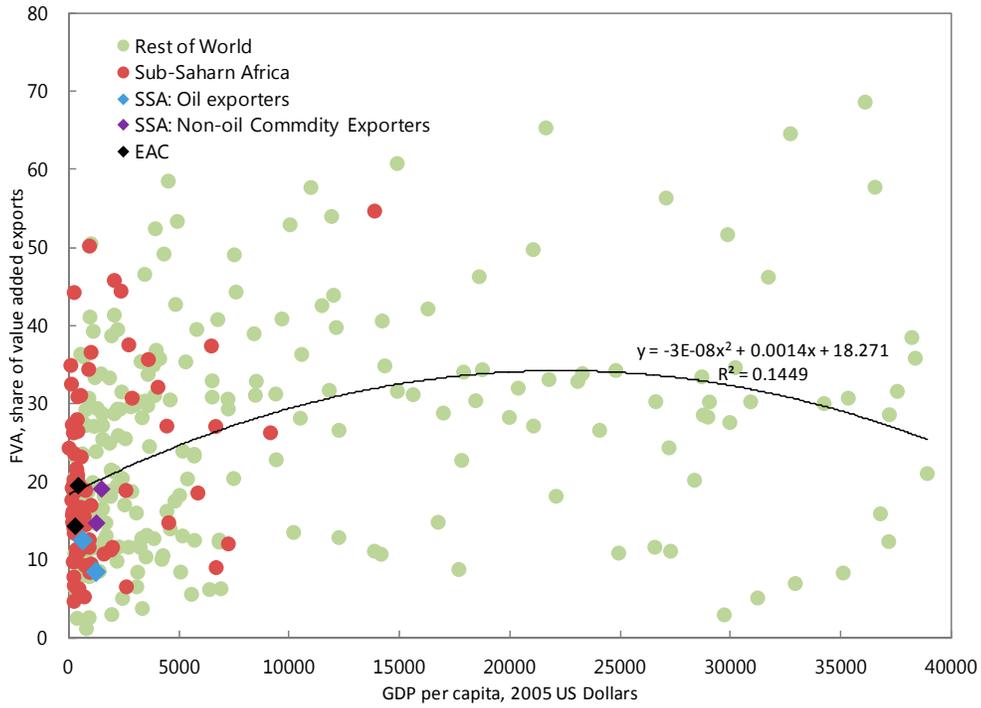


Figure 10b. Sub-Saharan Africa: Depth of Integration in Global Value Chains and Real GDP per Capita, Average 1991–95 and 2008–12

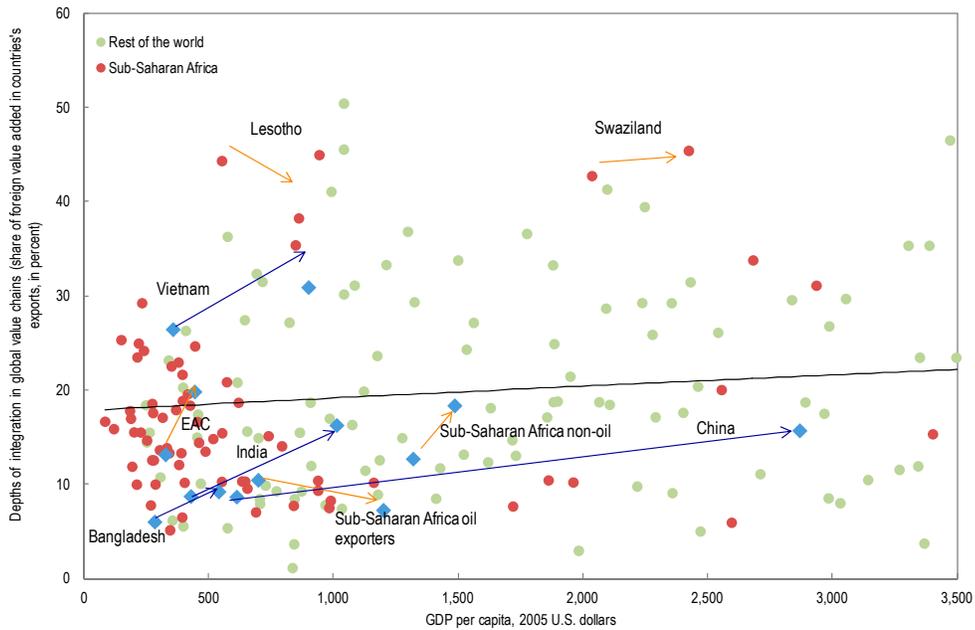


Figure 11. Sub-Saharan Africa: Global Value Chains Participation, Average 1991–95 and 2008–12

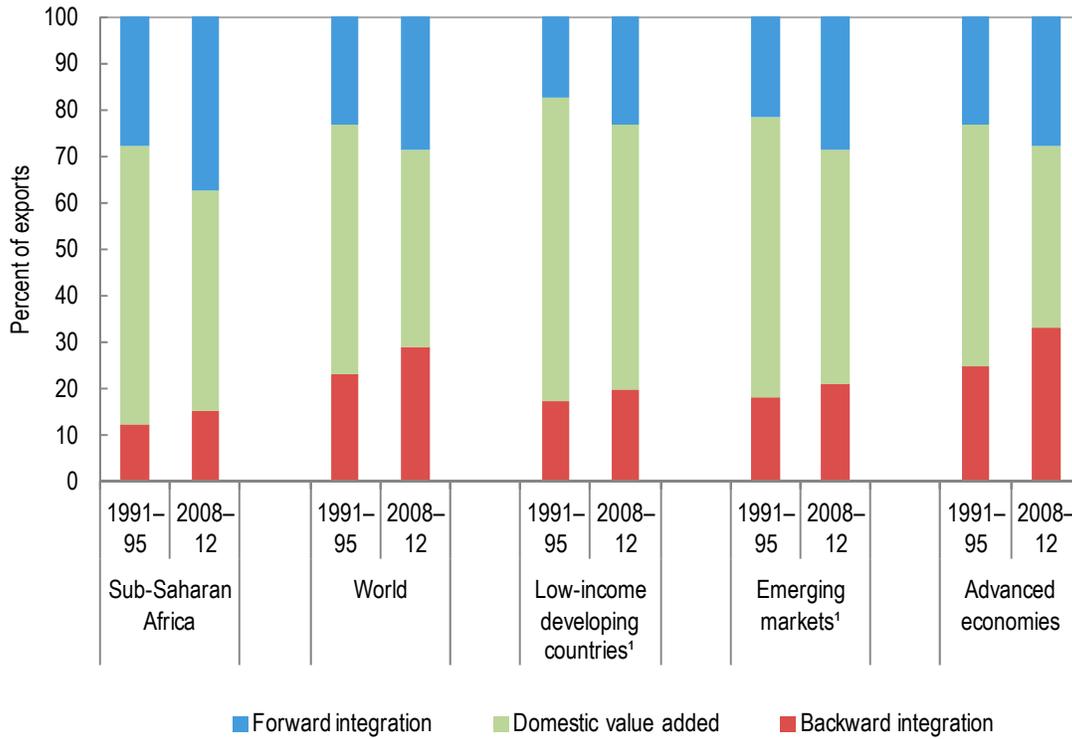


Figure 12. Sub-Saharan Africa and Comparator Countries: Depth of Integration in Global Value Chains, Average 2008–12

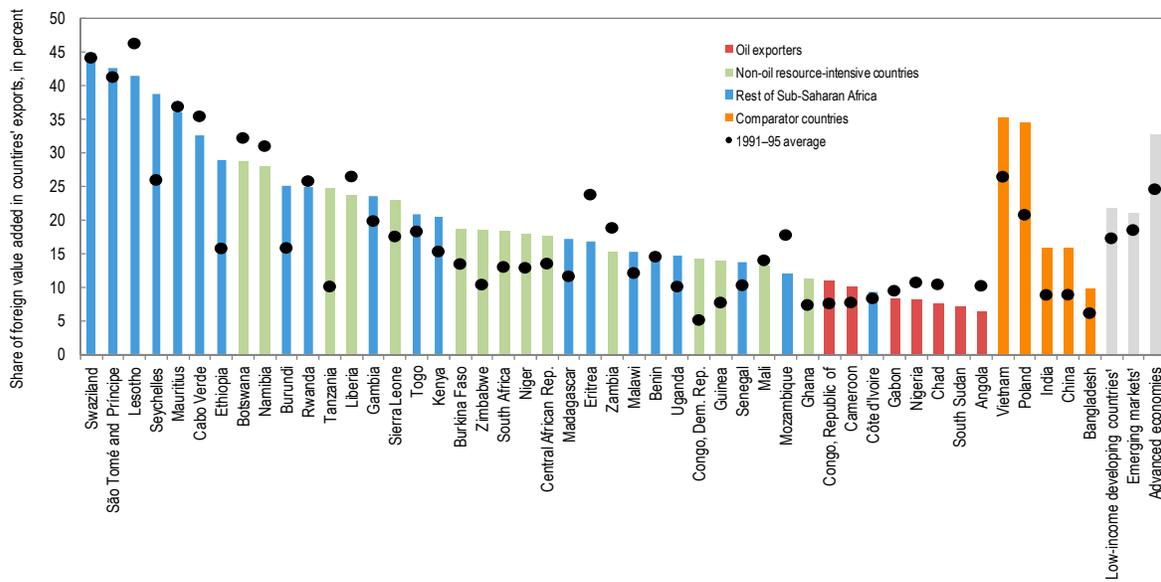
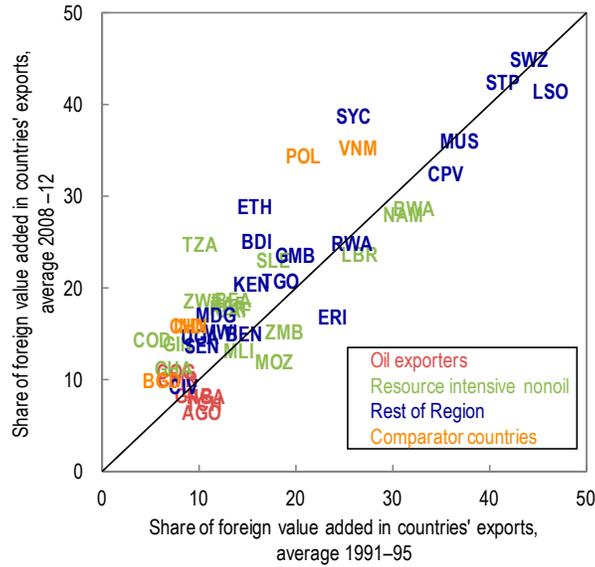
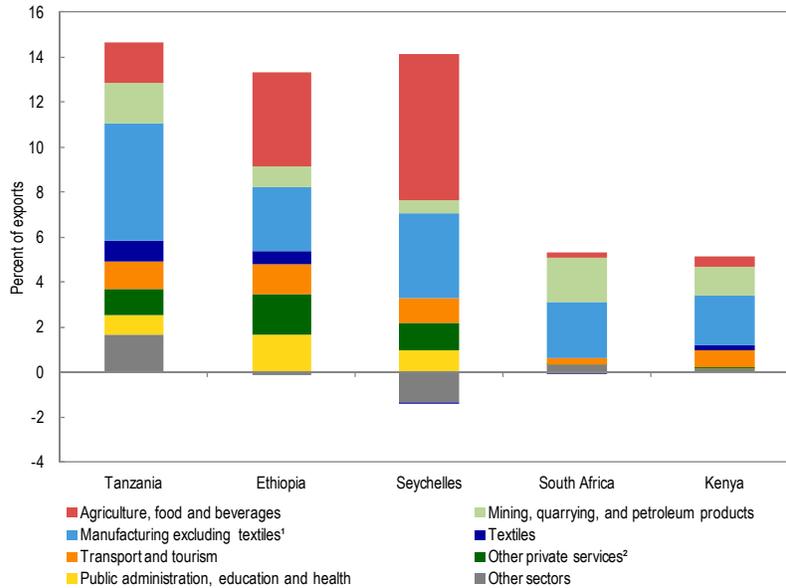


Figure 13. Sub-Saharan African Countries: Depth of Integration in Global Value Chains, Average 1991-95 vs. 2008-12



Sources: Eora database; and IMF staff calculations.

Figure 14. Sub-Saharan African Selected Countries: Decomposition of Change in Depth of Integration in Global Value Chains, Average 1991-95 to 2008-12

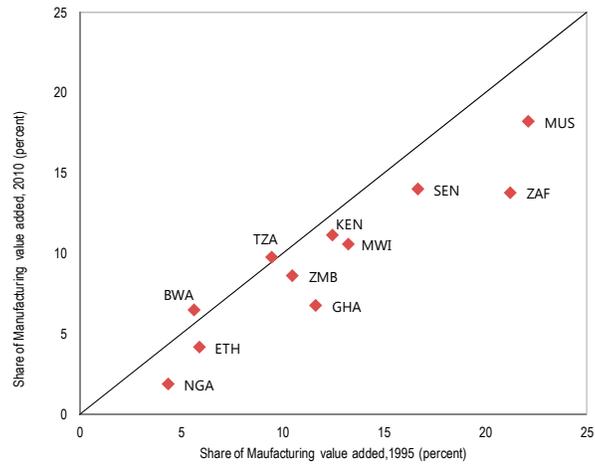


Sources: EORA database; and IMF staff calculations.

¹ Includes electrical and machinery, metal products, wood and paper, transport equipment, and other manufacturing.

² Includes construction, telecommunications, whole sale trade, maintenance and repair.

Figure 15. Sub-Saharan Africa: Share of Manufacturing Value Added



Sources: Groningen Growth and Development Center database (Timmer, de Vries, and de Vries, 2014); and IMF staff calculations.

¹The figure depicts the share of manufacturing value added as a percent of the economy's total value added in 1995 on the x axis and that in 2010 on the y axis. The majority of the countries experienced decreases in the share of manufacturing value added between the two years, depicted by the location underneath the 45 degree line, thus, indicating output deindustrialization (Rodrik, 2015).

Table 1. 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 2. 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.

Table 3. 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 (%GDP) (lag1)	0.082* (0.043)	0.080 (0.054)
education (%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 FE	Yes	Yes
Country FE	Yes	Yes
R-Squared	0.39	0.57

Robust Standard errors in parentheses

* indicate significance at 10%, ** at 5%, and *** at 1%.

Note: All variables are in natural log, except for Rule of law and quality of infrastructure, and the independent variables are lagged by 1 year.

Source: World Bank's WDI, Global Competitiveness Index, Eora database, and IMF staff calculations.