Services Trade in Africa: Structure and Growth

Andrea Ariu
and
Laura Ogliari

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Bringing Rigour and Evidence to Economic Policy Making in Africa

Services Trade in Africa: Structure and Growth

By

Andrea Ariu
University of Milan,
Centro Studi Luca d'Agliano and CRENOS, Italy
&
CEPR, UK
&
CESifo, Germany

and

Laura Ogliari
University of Bergamo, Italy
&
CEPR, UK

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List of abbreviations and acronyms

AERC	African Economic Research Consortium
AfCFTA	African Continental Free Trade Area
BaTIS	Balanced Trade in Services
CEPR	Centre for Economic Policy Research
EBOPS	Extended Balance of Payments Services
GVCs	Global Value Chains
IMF	International Monetary Fund
ITPD-E	International Trade and Production Database for Estimation
RTA	Regional Trade Agreement
STS	Skilled and Tradeable Sectors
OECD	Organization for Economic Co-operation and Development
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
USD	United States Dollar

Abstract

This paper shows that trade in services is still at its infancy in Africa; its growth started later than for other developed and developing economies and, so far, it involves mostly low-skilled services. Disentangling the different sources of trade growth, we find that demand and supply determinants have been relatively stable during the period 2002–2016, while service diversification and trade policy are the main propellants. In particular, trade in goods liberalization increased service trade as well due to the complementarities between the two. In terms of geographical and industrial involvement, services produced in Africa are able to reach farther destinations than goods, but they are concentrated on industries close to final demand, thus missing high-skilled services which are more upstream, but represent higher value-added inputs. Therefore, there is still plenty of scope to consider trade in services as a potential source of growth and development for African countries.

Key words: *Africa; Trade in services.*

JEL classification codes: *F10; F14; L80.*

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1. Introduction

Trade in services has been growing more than trade in goods for the past thirty years (World Trade Organization, 2019), and they represent an enormous potential source of growth for developing countries. First, because many of them can be exchanged "online" since they are intangible (e.g., Borchert & Mattoo, 2009; Francois & Hoekman, 2010); second, because their production is less capital-intensive, thus requiring lower investments in infrastructure, machines, etc., (e.g., Breinlich & Criscuolo, 2011; Ariu, 2016b). However, we know very little about the participation of developing countries, especially Africa, in services trade and global value chains (GVCs) due to lack of data and low attention for "marginal" actors in the global arena. This is especially salient since the switch to a service-led economy represents an essential step for development (e.g., Fan et al., 2021; Baccini et al., 2022), and the lack of evidence limits the creation of adequate policies.

This paper fills this gap by providing a comprehensive analysis of the supply, demand, and policy determinants of services trade growth for African countries. Results indicate that there is huge scope for trade in services to grow and foster development. African economies joined the trade in services boom later than developed and other developing countries, and still today its exports are mostly concentrated on low-skilled services. Trade policy and diversification show to be the main drivers of its growth, and trade liberalization in goods represents a propellant for African trade in services as well due to their complementarity. In terms of geographical scope of international service transactions, African economies are able to reach farther destinations than other countries and with respect to goods trade. However, they specialize in services which are too close to final demand (e.g., construction and transport services), thus missing the high value-added and skill-intensive ones that are more upstream (e.g., business and technical services). These results indicate that Africa is not yet exploiting this channel of growth and development. Therefore, adequate trade policies can potentially trigger a virtuous circle.

Using the newly available data from Loungani et al. (2017), we present, for the first time, a historical perspective on trade in services in Africa. African economies increased significantly their exports of services later than other developed and developing countries, and to a lesser extent. The average growth rate was five percentage points lower than the world average in the period 1980–1999, and three percentage points in the period 2000–2014, and Africa's contribution to world exports

was less than 1% of the total. This (slow) growth was driven mostly by Eastern and Southern countries, with South Africa, Egypt, Tunisia, and Nigeria as top exporters throughout the period 1980–2014, and Ethiopia, Kenya, Uganda, and Tanzania becoming more important in the mid 2000s.

In terms of sectoral specialization, Africa exports are mostly low-skilled services such as transport and travel. Other skilled services such as business services have so far failed to catch up with the world average. This is possibly due to a lack in building the human capital and the proper infrastructure to jump into the incredible growth of high-skilled services observed worldwide that led other developing countries such as Asia to develop. Focusing on these high-skilled services, South Africa accounts for most exports, but Mauritius, Ghana, Cameroon, and Tanzania seem to be catching up, while Nigeria is losing ground. Financial services and computer and telecommunication services are those mostly driving the growth of skilled services exports.

To understand these patterns, we decompose aggregate trade growth into its different components using the methodology of Redding and Weinstein (2019), and the data from Fortanier (2018) that has the bilateral variation needed to run appropriate gravity regressions which is lacking instead in Loungani et al. (2017), together with goods trade data from Borchert et al. (2021) to benchmark the service results. This technique allows disentangling supply, demand, diversification, and trade costs factors by aggregating sectoral-level gravity regressions at the bilateral-level. Results indicate that, supply, demand, and bilateral determinants of trade growth have remained stable over the period 2002–2009 for both services and goods exports for Africa, and also for the Rest of the World. Instead, the diversification of the service portfolio is increasing its importance.

To gain more insights on the bilateral trade costs and analyse further the service diversification determinants, we disentangle aggregate export values into number of products and average exports per product, and we run similar gravity equations that disentangle bilateral trade costs into geography (distance and sharing a common border), trade policy (the existence of trade agreements), cultural (common language), and historical (having being part of the same colony) factors, always controlling for multilateral resistance to trade (Anderson & van Wincoop, 2003), and supply and demand determinants by means of origin-time and destination-time fixed effects. The most important results are that, goods trade liberalization has a positive effect on services trade as well, and that Africa exports of services suffer less the negative effects of distance. The first finding is due to the complementarity between goods and services (e.g., Crozet & Milet, 2017a,b; Ariu et al., 2019, 2020). Therefore, by liberalizing goods trade all the services which are complementary to them also grow along. For example, transport, maintenance, and technical services are instrumental to selling the goods. Importantly, trade policy affects all trade margins, but it is mostly channelled by the intensive one, and it tends to have a selection effect on the number of products. The second result highlights that services exported by Africa can travel farther than services produced by other countries and also with respect to goods. This is true for all service categories, and suggests that, potentially, services could be well-integrated in GVCs.

Finally, we analyse the positioning of services and goods exports in GVCs. We take the upstreamness index developed by Antràs Antras et al. (2012) and calculate the weighted average of the upstreamness of services and goods exports for African countries in comparison with the rest of the World. We find that services are less upstream and goods are too much upstream with respect to what would be desirable and with respect to other developed and developing countries. More specifically, services are too close to final demand, which means that Africa exports mostly low-skilled services such as transport or construction, lacking the high-skilled ones (e.g., business and technical services) which are more upstream and represent higher value-added. Exported goods instead are mostly represented by raw materials and basic intermediates, which are relatively upstream in the manufacturing process. This means that Africa produces low-skill content goods that are relatively far from final demand and represent less value-added in the manufacturing GVCs. While trends for services indicate that upstreamness is slowly increasing, thus revealing that there are signs of improvement, for goods, upstreamness keeps increasing, which is instead not optimal in terms of the share of value-added that Africa is able to grasp within manufacturing GVCs. Zooming into the different African countries, the situation is rather flat, with most countries keeping the same GVCs positioning for both goods and services. The exceptions are Guinea, Angola, and Tanzania, which are increasing their upstreamness in service GVCs.

These results indicate that Africa has not being able, yet, to grasp the possibilities to grow and develop offered by trade in services. However, there are signals that suggest that Africa is slowly getting there. Different African countries are more and more involved in exporting services, especially the high-skilled ones, and they demonstrate to have a good capacity to sell services also in distant destinations. Therefore, there is the potential for observing in the foreseeable future service-led growth, and possibly, the base for development.

In terms of contribution, many papers study the features of trade in services (e.g., Breinlich & Criscuolo, 2011; Jensen, 2011; Gaulier et al., 2011; Kelle, 2013; Ariu, 2016b; Federico & Tosti, 2017; Walter & Dell'mour, 2010); while most of these studies have micro-data, they provide information for single developed economies, short time spans, and can rarely compare the findings to goods trade. This paper contributes to this literature by describing the long-run evolution of service trade and services GVCs from the perspective of developing countries, and with respect to trade in goods. In this way, this paper takes a comparative approach in which it is possible to compare services to goods, and developing to developed economies.

With respect to the methodologies, several papers have used gravity-type regressions for services. For example, Kimura and Lee (2006), Anderson et al. (2014), and Anderson et al. (2018) show that distance is a stronger constraint for services than for goods because their flow frequently needs the geographical and temporal coordination between customer and supplier for the transaction to take place (e.g., Francois & Hoekman, 2010; Ariu, 2016a; Anderson et al., 2018). This paper applies a novel methodology from Redding and Weinstein (2019) to services in order to analyse

the different determinants of trade growth. Moreover, thanks to the newly available data, it is possible to identify the specific role of trade policy, to disentangle aggregate values into the different trade margins, and to compare to goods trade.

The literature analysing trade policy issues on services has mostly considered service trade flows as independent from goods restrictions (e.g., Francois & Hoekman, 2010; Francois et al., 2003; Egger et al., 2012; Borchert & Di Ubaldo, 2021). The contribution of this paper is to consider together the goods and services restrictions to understand the complementarity between the two (e.g., Crozet & Milet, 2017a,b; Ariu et al., 2019, 2020).

The rest of this paper is structured as follows. Section 2 presents the data used for the analysis. Section 3 provides an historical perspective on the growth of trade in services. Section 4 analyses the determinants of services trade growth and the structure of service GVCs. Finally, Section 5 concludes the paper.

2. Data

This paper benefits from two main sources of data for trade in services. The first records exports of services for 192 countries during the period 1970–2014 and has been constructed from Loungani et al. (2017). The data is organized at the exporter-service-year level and it accounts for 66 categories of services (BPM6). We group service categories in ten main ones and we keep only the years starting from 1980 to have a stable number of African countries. With this data we provide long-run perspective on the growth of services, comparing African countries to other developing and developed countries to provide comprehensive evidence on the service and country dimensions of trade growth. To compare the results of services with goods trade, we make use of the UNCTAD Statistics (2022) database that covers for the same time period exports of goods at the country-level.

The second source is the Balanced Trade in Services (BaTIS) data set from Fortanier (2018), which records trade in services from 1995 to 2016 at the origin-destination-service-year level. The classification of services follows the usual EBOPS categories that we aggregate in ten categories as the previous source. The crucial advantages of these data are that they cover most African countries, and they embed the bilateral dimension which is not present in Loungani et al. (2017), thus allowing for running well-specified gravity models to understand the determinants of trade growth. More in detail, we take information on flows which are not yet balanced in order to avoid the results depending on the tools used for that operation.[1] Again, to benchmark the results for services with evidence on trade in goods, we use the International Trade and Production Database for statistical estimation (ITPD-E) described in Borchert et al. (2021), which covers the period 2002–2016 for manufacturing exports at the origin-destination-product-year level. We group products into 18 main categories to have a similar level of disaggregation as for services.

Our main trade policy variables come from Egger and Larch (2008), which record for the period 1950–2019 and any country pair and year, whether there is an active trade agreement in either goods, services or both. More specifically, they account for Customs Unions, Free Trade Agreements, and Partial Scope Agreements which are related to goods liberalization only; Economic Integration Agreements, which are related to services only; or the presence of both a good-related and service-related agreement together. One feature of the period of analysis is that service trade agreements are always implemented together with goods trade agreements.

Therefore, it is not possible to discern their effect alone. So, starting from the raw data, we construct for any country-pair and year a trade liberalization dummy for goods only (RTA^{Gonly}_{ij}) and one for both goods and services ($RTA^{G\&S}_{ij}$). Unfortunately, it is difficult to have better measures of trade liberalization for services because all service trade restrictions are non-discriminatory, i.e., they do not vary by partner country, and are absorbed by the usual country-year (or country-sector-year) fixed effects. Moreover, they are either available only for one year (i.e., the World Bank Service Restrictiveness Index for 2008), or only at the end of the period of analysis (such as the OECD Services Trade Restrictiveness Index that starts in 2014).

To implement the gravity approach, we use the usual gravity covariates from Head et al. (2010). The final sample for the gravity analysis spans from 2002 to 2016, have both information on goods and services exports together, and is organized at the exporter-importer-sector-year level.

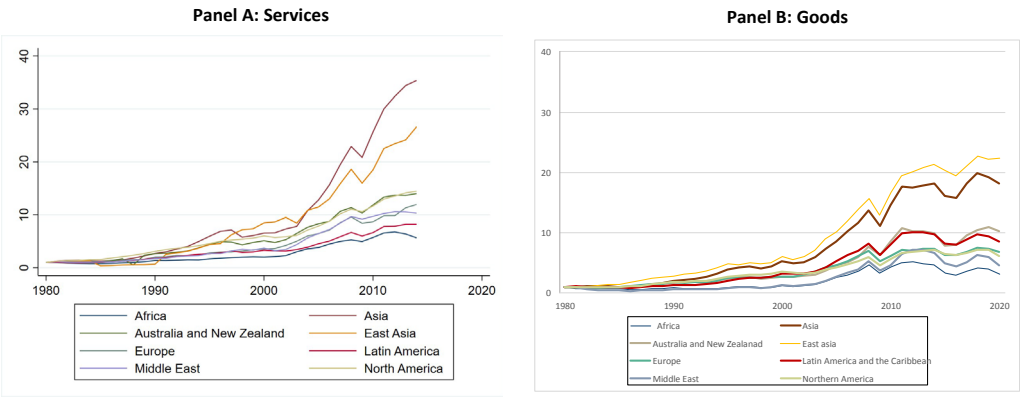
3. An historical overview of trade in services in Africa

Using the data set of Loungani et al. (2017) just described, we provide in this section an historical overview of trade in services for Africa in comparison with other continents,[2] highlighting the main stylized facts.

African trade in services is lagging behind

World trade in services grew by a factor of 10 in the period between 1980 and 2014, and their growth has been particularly fast in the last decade partly reflecting improvements in information and communications technology that made services more and more tradeable (e.g., Freund & Weinhold, 2004; Ariu & Mion, 2017), and partly due to policy efforts. Figure 1 disentangles this growth in service export since 1980 by continent and compares it with exports in goods. The first thing to notice is that most of service growth happened around the 2000s, and it is mostly accounted by Asian economies, which grew by a factor higher than 25. Europe, North America, Oceania, and the Middle East grew by a factor of 10, while Africa and Latin America showed lower growth rates and a later discontinuity in the series. Similar to service exports, trade in goods accelerated dramatically in the 2000, mainly due to Asian economies. However, differently from services, its growth started earlier, around the 1990s, and it slowed down after 2010. These results suggest that services represent a growth factor much more than goods trade. Moreover, Asian countries, such as India and the Philippines, are exemplary cases of service-led development trajectories with trade in services growing faster than goods (e.g., Mayer, 2021). Therefore, services can represent an enormous potential for growth also in developing countries. Overall, these figures paint a picture of a rapidly growing sector, where new actors have been emerging since the 2000s and that, thanks to the falling costs of information technology and increasing access to the Internet, will possibly continue to grow more than goods.

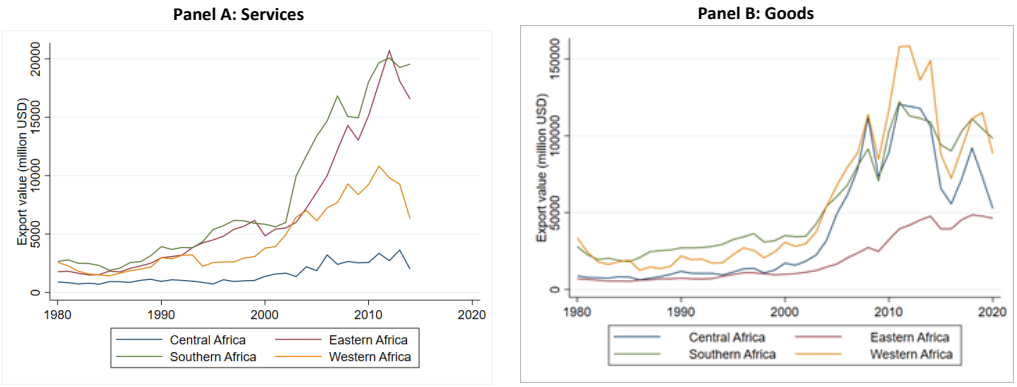
Figure 1: Trade in services growth by region, 1980 normalized to one



Note: This figure shows the evolution of services (panel A) and goods (panel B) exports normalized in 1980 for different continents during the period 1980–2016.
Source: Loungani et al. (2017); and UNCTAD Statistics (2022).

Africa appears to have been the least interested by the globalization of services. Notwithstanding the paramount importance that the service sector has for African economies, data shows how African countries have only dipped their toes in trading services: exports were around 2.5% of GDP in the 1980s and accounted for less than 4% of the continent GDP in 2012—for comparison, in the same period, good exports oscillated around 15-20% of GDP according to the World Bank data. Similar to the Rest of the World, service exports in Africa grew faster than goods exports, and enjoyed a more significant expansion starting in the mid 2000s. In fact, service exports in Africa grew on average less than 10% per year in the 1980–1999 period (compared to a world average of more than 15%) and by a yearly average of 13% in the 2000–2014 period (compared to a world average of 16%). Moreover, Africa was the region of the world that contributed less to trade in services in the 2010s, accounting only for 1% to the total value of service exports (Figure A1 in the appendix). Nevertheless, African countries seem to be aware of the enormous potential for development that services trade holds for their economies (e.g., the UNCTAD–UNECA project) and want to grasp opportunities for export diversification, services-led transformation and growth that services export may offer. For example, trade in services is at the centre of the African Continental Free Trade Area (AfCFTA) agreed by African leaders in March 2018.[3]

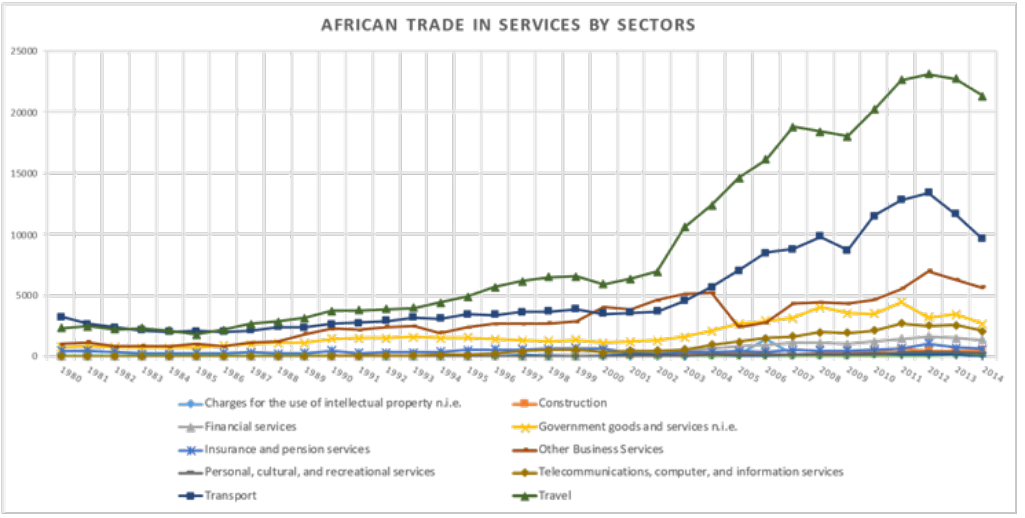
Figure 2: Evolution of trade in services and Trade in goods in Africa by region



Note: This figure shows the evolution of services (panel A) and goods (Panel B) exports for different African regions during the period 1980–2016.
Source: Loungani et al. (2017); and UNCTAD Statistics (2022).

Zooming into Africa, the overall trends in trade in services for African economies hide significant geographic and sectoral heterogeneity.[4] Panel A of Figure 2 plots the value of service exports for different African regions, while Panel B provides a visualization of the data for export in goods for comparison. For services, it is apparent from the graph that the growth was not homogeneous in the continent; rather it was concentrated in Eastern and Southern Africa. This is interesting since exports in goods show a different dynamic: first, there is much less geographical variation in regional trends of goods' export; second, Eastern Africa is the region that displays lower levels of growth throughout the period. Figure A2 (in the appendix) zooms further in and shows the geographic distribution of services and goods exports in Africa, and how this distribution evolved over time. While South Africa, Egypt, Tunisia, and Nigeria have been the top contributors to African services exports since the 1980s, Eastern Africa countries like Ethiopia, Kenya, Uganda, and Tanzania have begun playing a major role in the mid 2000s, jointly accounting for approximately 25% of services exports in 2014. With respect to goods, services are much more evenly spread across African countries.

Figure 3: African trade in services: Sectoral evolution

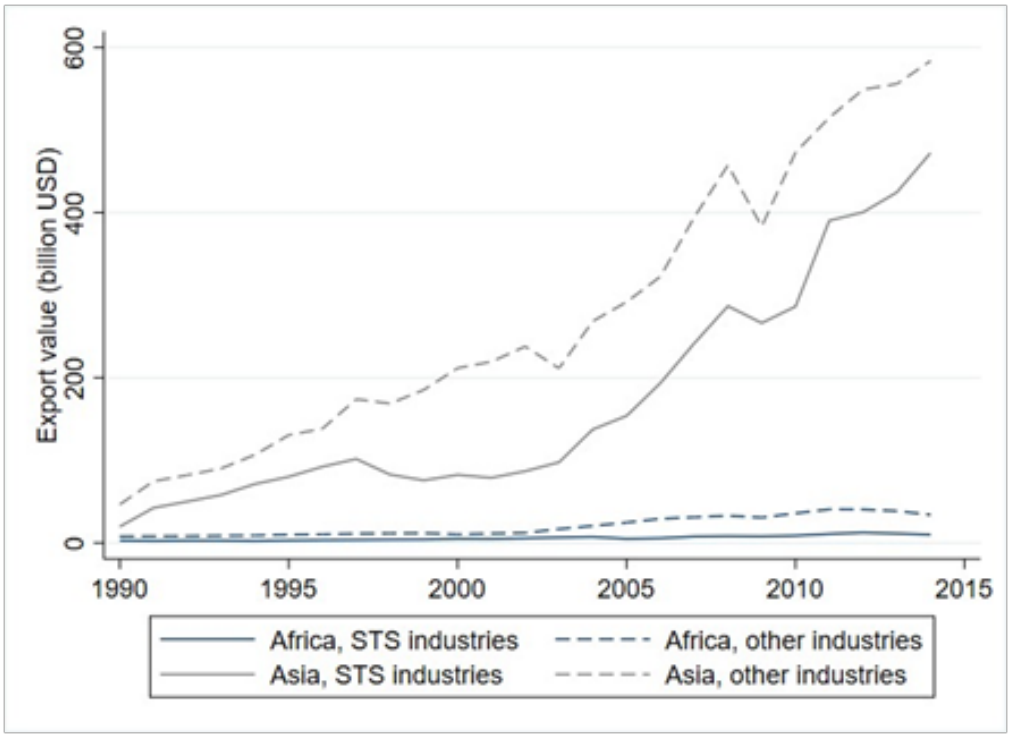


Note: This figure shows the evolution of services exports by sector during the period 1980–2016.
Source: Loungani et al. (2017).

Africa specializes mostly in low-skill services

Looking at the services composition of trade growth reveals a striking heterogeneity. Figure 3 displays the evolution of value (million USD) of African export in services in the period 1980–2014 disaggregated for ten different service products. The graph clearly shows that much of service-export expansion in Africa since the 2000s occurred in the travel and transport. These more traditional sectors are less skill and technology intensive and are less likely to spur productivity gains (Loungani et al., 2017) The limited availability of high-skilled labour and related high-tech infrastructure likely limited the expansion of productivity-boosting services. Figure A3 shows a positive correlation between services export growth and the Network Readiness Index—a composite index that takes into account the regulatory environment, skill abundance, and the quality infrastructure—suggesting that the areas that experienced a faster growth in services export were those catching up on the digitalization front. If we restrict our attention to "Skilled and Tradeable" sectors (STS), those that led employment and wage growth in developed economies since the 1980s, we clearly see that Africa is lagging behind.[5] Figure 4 shows the evolution of STS sectors in Africa and Asia. The graph highlights how trade skill-intensive service industries are still underdeveloped compared to the boom that those industries experienced in Asia starting from the mid 2000s. Table A1 (in the appendix) reports the top five exporting countries in STS industries separately for the 2000–2009 and 2010–2015 periods. Unsurprisingly, South Africa, the most developed economy in sub-Saharan Africa, is almost invariably the top contributor. Kenya and Mauritius also seem on the way of specializing in skill-intensive industries, while other countries exported only in a few of STS sectors.

Figure 4: Skilled and tradeable sectors

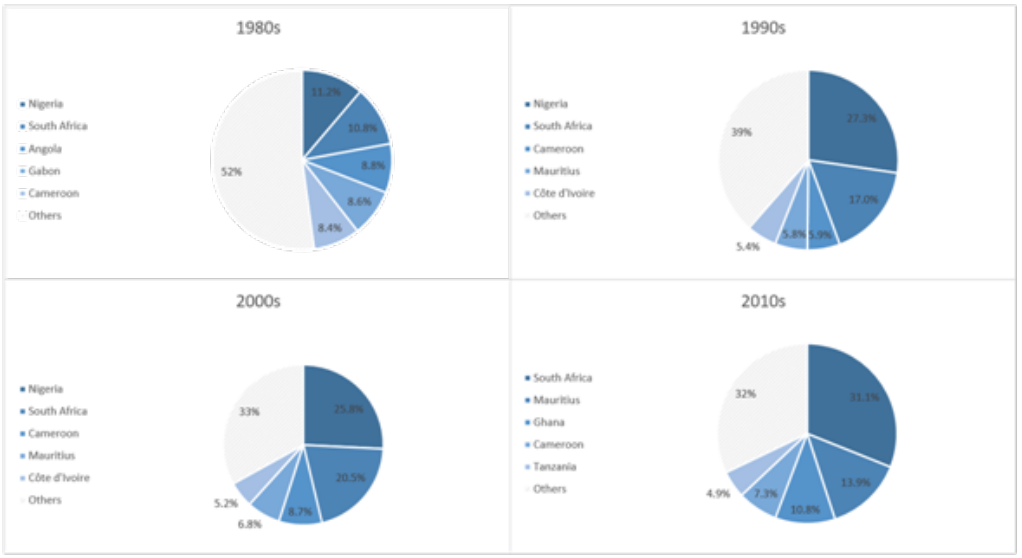


Note: This figure shows the evolution of services exports for Asia and Africa, distinguishing across STS industries and other industries during the period 1980–2016.
Source: Loungani et al. (2017); and Eckert et al. (2019).

Figure A4 (in the appendix) displays the evolution of each STS industry and shows how the only high-skilled service category which shows above-average growth is the "Business Services" category. Zooming in on this specific industry Figure 5 details the top players in the sector.[6] The figure reports the top 5 exporting countries in each decade and their share of export. The picture offers two insights. First, there is a high degree of concentration in the business services sector, and this concentration has grown over time. The share exported by the top five countries increases from 48% in the 80s to 68% in the 2010s, and the contribution of the top exporter grows from 11.2% to 31.1%. Second, while some countries (South Africa, Mauritius, and Cameroon) have consistently been important actors in the business services sector throughout the years, new countries like Tanzania and Ghana have started to play a bigger role in most recent years. Nigeria, instead, represent a peculiar case. The country became export-oriented early on, and was one of the main African exporters in the tertiary sector; however, after 2011 in the height of the financial crisis, it experienced a sharp decrease in its services exports, mainly due to a reduction of Nigerian imports from its main trading partner, the US. In general, the trade in services category grew at a similar pace as transport till the mid 2000s, but then it stopped its growth and remained

roughly stable in the following years. This is problematic because this service category is the main component of trade growth worldwide in the past 20 years (World Trade Organization, 2019). This means that Africa is likely missing a ticket to development.

Figure 5: African trade in services: Business services



Note: This figure shows the top five African services exporters in 1980s, 1990s, 2000s, and 2010s.
Source: Loungani et al. (2017).

Overall, the results of this section show that Africa is still a marginal player in the global market of trade in services, and that services exports in Africa grew less than in all other continents. Eastern and Southern Africa are the regions that participate more in trade in services, and African services exports is still dominated by low-skilled, traditional sectors, while high-skill intensity sectors have started to grow only recently and mildly. These results highlight the enormous potential that is still unexploited in the African context. Africa is still at its infancy of trade in services, and there is scope for a service-led development provided all countries will be able to catch up on the digitalization front (de Melo & Solleder, 2021).

4. Understanding the forces underneath trade in services growth

In this section, we study the driving forces underneath the dynamics highlighted in the previous section. First, we analyse supply, demand, and bilateral determinants of services trade growth. Second, we disaggregate the bilateral components of trade costs into geographical and policy factors. To provide a meaningful benchmark, we compare the results of trade in services with those of trade in goods.

Supply, demand, and bilateral costs

To understand the driving forces underneath the trade growth observed in the previous section, we use the methodology developed by Redding and Weinstein (2019). Starting from sectoral-level gravity regressions of the style:

$$lnx_{ijs} = \gamma_{is} + \delta_{js} - \alpha_1 \tau_{ij} + \epsilon_{ijs} \quad (1)$$

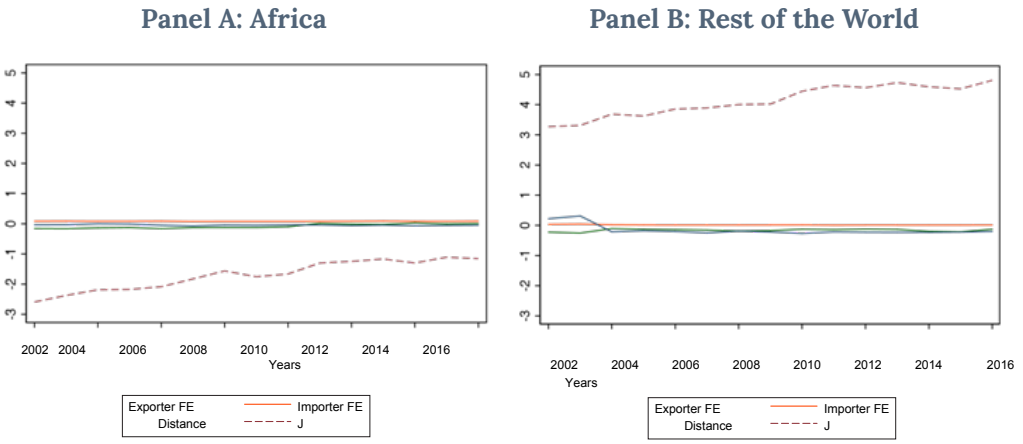
where, γ_{is} and δ_{js} are, respectively, origin-sector and destination-sector fixed effects, and τ_{ij} captures the bilateral trade costs, we can aggregate it following Redding and Weinstein (2019) as:

$$lnX_{ij} = -T_{ij} + \Gamma_{is} + \Delta_{js} + J_{ij} + E_{ijs} \quad (2)$$

where, Γ_{is} and Δ_{js} are the average of the origin-sector and destination-sector fixed effects, and represent the contribution of supply and demand. T_{ij} represents the average of the sector bilateral trade costs. J_{ij} is a Jensen's composition term that corrects for the difference between the sum of the logs and the log of the sum that arises in the aggregation process. This term is particularly interesting because it represents a diversification index, thus accounting for how diversity in the export product portfolio drives trade flows.[7] Finally, E_{ijs} is the sectoral average of the error terms. Figure 6 shows, for the period 2002–2016, the contribution of supply (origin), demand (destination), J, and bilateral costs factors for African economies (Panel

A) and the Rest of the World (Panel B) with focus on trade in services.[8] For both the contributions of distance, supply and demand show to be relatively stable over the period of analysis. Therefore, their role did not change in the period of analysis. Instead, the diversification index *J* shows to have positively fostered services flows for the Rest of the World, while negatively for Africa. This means that African countries lag in the level of diversification in services, and this represents a limit for services exports for Africa. The good news is that trends are positive, pointing at an increasing diversification which should lead, in the foreseeable future, to a positive contribution.

Figure 6: Supply, demand, and bilateral components of aggregate gravity for services



Notes: Panel A represents the contribution of supply, demand, bilateral costs, and J for trade in services in Africa over the period 2002–2016 using the methodology of Redding and Weinstein (2019). Panel B shows the same for the Rest of the World.
Source: Fortanier (2018); Head et al. (2010).

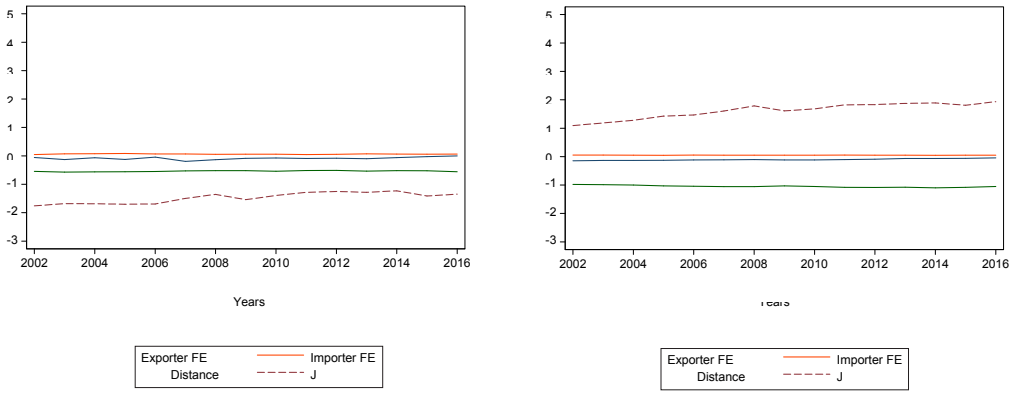
Thanks to the availability of goods flows for the same period, it is possible to benchmark the results for services looking at manufacturing exports in Figure 7. The results are actually quite similar. Demand, supply, and bilateral factors are relatively stable for both Africa (Panel A) and the rest of the world (Panel B). Instead, the contribution of the diversification index is negative for Africa, while positive for the Rest of the World. Also, in this case, trends are upwards, pointing at the fact that product diversification is an important source of trade growth. All in all, these results indicate that the export diversification of African economies lags behind that of rest of the world, and this is one of the main issues for its poor contribution to trade growth.

Focus on bilateral factors

There are two main results that are particularly worth further investigation from the previous subsection. First, the increasing role of diversification for trade growth makes one wonder what its determinants are in order to draft appropriate policy responses.

Figure 7: Supply, demand, and bilateral components of aggregate gravity for goods

Panel A: Africa **Panel B: Rest of the World**



Notes: Panel A represents the contribution of supply, demand, bilateral costs and J for trade in goods in Africa over the period 2002–2016 using the methodology of Redding and Weinstein (2019). Panel B shows the same for the Rest of the World.
Source: Borchert et al. (2021); and Head et al. (2010).

Second, it is puzzling that despite all the liberalization efforts that have been put in place, the role of bilateral trade costs have remained relatively stable over time. To analyse the first point, we disaggregate log exports into the number of products/services that we denote with # $Prod_{ijt}$, and the average exports per product, Int_{ijt}. Moreover, we are analysing how the product and service exports portfolio of African countries evolved over time by looking at their GVCs involvement. With respect to the second point, we disaggregate the role of distance by taking into account other geographical, cultural, and institutional bilateral determinants of trade such as sharing a common border, $Contiguity_{ij}$; sharing the same official language, $Common\ Language_{ij}$; having shared colonial origins, $Common\ Colony_{ij}$; and trade policy determinants measured as the presence of trade agreements that cover goods trade, RTA^{Gonly}_{ijt}, or both in goods and services, $RTA^{G\&S}_{ijt}$.[9] Using the same gravity approach, we regress separately the log export values, number of products or average exports per product from country *i* to country *j* at time *t* on origin-year and destination-year fixed effects and the covariates presented before separately for goods and services. Analytically:

$$logExp_{ijt} = \gamma_0 + \gamma_1 logDist_{ij} + \gamma_2 RTA_{Gonly_{ijt}} + \gamma_3 RTA_{Gij t\&S} + \gamma_4 Contig_{ij} + \gamma_5 C.Lang_{ij} + \gamma_6 C.Col_{ij} + \lambda_{it} + \delta_{jt} + \upsilon_{ijt} \quad (3)$$

The results in Table 1 show that distance plays a negative role on all trade margins and for both goods and services. In addition, the size of the coefficients suggests that most of the negative effect is channelled through the intensive margins, meaning

that distance decreases especially the average exports per product. Having an RTA in goods only or both in goods and services instead is positive for both goods and services. However, the effect shows to be always negative for the number of products for services and in one instance for goods. In other words, sharing an RTA in goods or both goods and services fosters trade mostly through the intensive margin, while there seems to be a selection effect for the number of services and products. The most important message of these results is that trade liberalization in goods can have positive effects also on trade in services, as shown by the positive and significant coefficient of RTA^{Gonly}_{ijt}. This is because there are complementarities between the two and lowering barriers on one can foster both (e.g., Crozet and Milet, 2017a,b; Ariu et al., 2019, 2020). A simple example of these mechanisms is transport services, which benefits directly from an increase in trade in goods.

Table 1: Bilateral determinants of trade

	(1)	(2)	(3)	(4)	(5)	(6)
	Services			Goods		
	log Exp$_{ijt}$	**log # Prod**$_{ijt}$	**log Int**$_{ijt}$	**log Exp**$_{ijt}$	**log # Prod**$_{ijt}$	**log Int**$_{ijt}$
log Distance$_{ij}$	-0.709[a]	-0.029[a]	-0.680[a]	-1.475[a]	-0.367[a]	-1.108[a]
	(0.012)	(0.002)	(0.011)	(0.016)	(0.005)	(0.013)
$RTA_{Gonlyijt}$	0.242[a]	-0.021[a]	0.263[a]	0.648[a]	0.172[a]	0.475[a]
	(0.029)	(0.005)	(0.027)	(0.036)	(0.011)	(0.030)
$RTA_{Gijt\&S}$	0.697[a]	-0.039[a]	0.737[a]	0.505[a]	-0.142[a]	0.647[a]
	(0.0301)	(0.006)	(0.029)	(0.036)	(0.013)	(0.031)
Contiguity$_{ij}$	0.807[a]	0.068[a]	0.739[a]	0.680[a]	0.0648[c]	0.745[a]
	(0.071)	(0.010)	(0.067)	(0.089)	(0.035)	(0.067)
Common Language$_{ij}$	0.408[a]	0.023[a]	0.386[a]	0.941[a]	0.306[a]	0.635[a]
	(0.021)	(0.004)	(0.020)	(0.030)	(0.010)	(0.026)
Common Colony$_{ij}$	1.033[a]	0.085[a]	0.948[a]	0.769[a]	0.107[a]	0.661[a]
	(0.067)	(0.013)	(0.062)	(0.081)	(0.031)	(0.067)
FE_{it}	Yes	Yes	Yes	Yes	Yes	Yes
FE_{jt}	Yes	Yes	Yes	Yes	Yes	Yes
Observations	282,142	282,142	282,142	457,632	457,632	457,632
R-squared	0.865	0.653	0.863	0.740	0.629	0.692

Notes: Robust standard errors clustered at the origin-destination level. a p<0.01, b p<0.05, c p<0.1.
Source: Fortanier (2018); Borchert et al. (2021); Egger and Larch (2008);, and Head et al. (2010).

Therefore, in the accounting of the positive effects of trade liberalization, it is important to take into account the service-goods cross effects. Looking at the other covariates, sharing a border, a common language, or colonial origins have a positive effect on all margins. With the exception of the number of products, all the covariates have the same sign for both goods and services, suggesting that their effect is similar for both goods and services. To identify their specific role for

Africa, we add to the previous specification the interaction of all covariates with a dummy that identifies African economies as exporters, Africai. The results in Table 2 show that distance plays a less negative role for services originating from African countries and all trade margins.

Table 2: Bilateral determinants of trade for Africa

	(1)	(2)	(3)	(4)	(5)	(6)
	Services			Goods		
	log Exp_{ijt}	log # $Prod_{ijt}$	log Int_{ijt}	log Exp_{ijt}	log # $Prod_{ijt}$	log Int_{ijt}
log $Distance_{ij}$	-0.738[a]	-0.0312[a]	-0.707[a]	-1.461[a]		-1.105[a]
	(0.013)	(0.002)	(0.012)	(0.017)	(0.006)	(0.014)
log $Distance_{ij}$ *$Africa_i$	0.211[a]	0.0205[a]	0.193[a]	0.0798[c]		0.0111
	(0.028)	(0.006)	(0.027)	(0.044)	(0.014)	(0.037)
$RTA_{Gonlyijt}$	0.286[a]	-0.0169[a]	0.304[a]	0.482[a]		0.360[a]
	(0.033)	(0.006)	(0.031)	(0.040)	(0.013)	(0.033)
$RTA_{Gonlyijt}$*$Africa_i$	-0.0585	0.00577	-0.0482	0.560[a]		0.473[a]
	(0.069)	(0.016)	(0.064)	(0.093)	(0.029)	(0.080)
$RTA_{Gijt\&S}$	0.683[a]	-0.0450[a]	0.723[a]	0.483[a]		0.624[a]
	(0.031)	(0.006)	(0.030)	(0.036)	(0.013)	(0.031)
$RTA_{Gijt\&S}$*Africai	0.282	0.100b	0.196	2.347[a]		1.825[a]
	(0.253)	(0.045)	(0.219)	(0.312)	(0.129)	(0.253)
$Contiguity_{ij}$	0.779[a]	0.0608[a]	0.721[a]	0.321[a]		0.570[a]
	(0.084)	(0.013)	(0.078)	(0.102)	(0.041)	(0.077)
$Contiguity_{ij}$ *Africai	0.297[b]	0.0619[a]	0.231c	0.988[a]		0.433[a]
	(0.140)	(0.024)	(0.130)	(0.185)	(0.062)	(0.151)
Common $Language_{ij}$	0.431[a]	0.0330[a]	0.398[a]	0.937[a]		0.631[a]
	(0.025)	(0.005)	(0.024)	(0.035)	(0.011)	(0.030)
Common $Language_{ij}$*Africai	-0.0828[b]	-0.0307[a]	-0.0511	0.0395	0.00658	0.0329
	(0.039)	(0.008)	(0.037)	(0.060)	(0.018)	(0.051)
Common $Colony_{ij}$	1.016[a]	0.0847[a]	0.930[a]	0.798[a]		0.709[a]
	(0.071)	(0.014)	(0.066)	(0.086)	(0.032)	(0.071)
Common $Colony_{ij}$*Africai	0.0486	-0.0283	0.0775	0.189	0.355	-0.166
	(0.165)	(0.030)	(0.166)	(0.218)	(0.086)	(0.188)
FE_{it}	Yes	Yes	Yes	Yes	Yes	Yes
FE_{jt}	Yes	Yes	Yes	Yes	Yes	Yes
Observations	282,142	287,741	282,142	457,632	457,632	457,632
R-squared	0.866	0.646	0.863	0.741	0.632	0.692

Notes: Robust standard errors clustered at the origin-destination level. a p<0.01, b p<0.05, c p<0.1.
Source: Fortanier (2018); Borchert et al. (2021); Egger and Larch (2008); and Head et al. (2010).

Therefore, African exports are able to reach more distant destinations than those originating from other countries. This is an extremely important result, because reaching distant destinations is crucial for trade growth and the services sector shows to be very performant in this dimension. Instead, for goods, distance plays a more negative role for African countries, thus indicating that for goods it is harder than for other countries to reach distant destinations. Turning to the policy variables, the positive effect of RTAs is stronger for African economies for trade in goods only. This is another positive dimension because it seems that RTAs involving Africa are more successful than for other countries. However, these results highlight that more emphasis should be given to the liberalization of services as well. Another factor which shows to be particularly important for African exports is sharing a border, which is more positive than for the Rest of the World. Instead, sharing a common language is less positive for Africa than for other countries for trade in services, and the other covariates do not register a significant differential effect for Africa.

Focusing on the role of trade policy, we run a more demanding specification in which we control for any bilateral factor which is not time-variant by means of origin-destination fixed effects. The identification is thus based on over time variation within country pairs only. The idea is to control for any time-invariant bilateral determinants which could be driving trade flows. Despite the important loss in the identifying variation available, Table A2 (in the appendix) shows that, having an RTA in goods or both in goods and services is still positive and significant, though not for all trade margins. Therefore, trade policy shows to be an important driver of trade in goods and services for Africa, and its effect is not driven by other unobserved bilateral factors which are time-invariant.

To assess whether the differences highlighted between goods and services are statistically significant, and understand which services suffer less from the negative effect of distance, we use the data at the origin-product/sector-destination-year level, we append the services data to the goods data and we run the following gravity specification in which each gravity variable is interacted with a dummy identifying African exporters and dummies identifying the *k* different service categories, together with origin-product/service-time, destination-product/service-time, origin-destination fixed effects and all the relevant interactions needed to saturate the model that are not absorbed by the fixed effects:

$$logExp_{ijst} = \gamma_0 + ... + \gamma_3^k logDist_{ij} * Africa_i * Serv_s^k + ... + \eta_{ist} + \sigma_{jst} + \zeta_{ij} + \chi_{ijst} \quad (4)$$

The coefficients tell whether distance plays a differential role for African exporters, and each *k* service category with respect to other countries and trade in goods. It is, therefore, like a triple difference strategy in which we compare each service exported by African countries to the same service exported by different economies and with

respect to the average effect of distance on goods. Similarly, the interactions with the other gravity variables will identify the same differential effect.

The results in Table 3 indicate that all services originating from Africa suffer less distance than the same services exported by other countries and with respect to trade in goods. Instead, the positive effect of having a goods trade agreement, both goods and services trade agreement, sharing the same border or the same official language is smaller for services originating from African economies. Finally, having being part of the same colony is more positive. Therefore, it looks like all services originating from Africa tend to travel farther than for other countries, and farther than goods. This "death of distance" for African services is an important message that puts optimism for their future growth.

Table 3: Differential determinants of trade for Africa

Dep. Var.:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	log Exp$_{ijst}$					
Africa$_i$*Transport$_s$	0.549^a	-0.592^a	-1.842^b	-0.363^c	-0.427^a	1.062^a
	(0.045)	(0.096)	(0.734)	(0.203)	(0.061)	(0.200)
Africa$_i$*Travel$_s$	0.513^a	-0.527^a	-1.705^c	0.0635	-0.342	1.109^a
	(0.047)	(0.103)	(0.898)	(0.207)	(0.063)	(0.186)
Africa$_i$*Construction$_s$	0.404^a	-0.510^a	-1.491^a	-0.349	-0.289	1.303^a
	(0.057)	(0.127)	(0.508)	(0.223)	(0.075)	(0.265)
Africa$_i$*Insurance$_s$	0.602^a	-0.635^a	-1.704^c	-0.974^a		1.366^a
	(0.050)	(0.123)	(0.881)	(0.236)	(0.068)	(0.179)
Africa$_i$*Financial$_s$	0.757^a	-0.858^a	-2.398^b	-0.793^a		0.621^a
	(0.052)	(0.124)	(0.987)	(0.247)	(0.068)	(0.180)
Africa$_i$*Telecom. & Computer$_s$	0.506^a	-0.488^a	-1.877^b	-0.879^a		1.078^a
	(0.048)	(0.104)	(0.773)	(0.215)	(0.064)	(0.182)
Africa$_i$*IPR$_s$	0.642^a	-0.653^a	-1.524^b	-1.731^a		0.749^a
	(0.055)	(0.141)	(0.769)	(0.353)	(0.0754)	(0.234)
Africa$_i$*Business$_s$	0.551^a	-0.545^a	-1.795^b	-0.496^b		1.051^a
	(0.046)	(0.099)	(0.752)	(0.199)	(0.063)	(0.198)
Africa$_i$*Personal$_s$	0.637^a	-0.820^a	-1.523^b	-0.811^a		0.890^a
	(0.053)	(0.13)	(0.720)	(0.270)	(0.071)	(0.191)
Africa$_i$*Government$_s$	0.692^a	-0.715^a	-2.696^a	-0.821^a		1.055^a
	(0.051)	(0.12)	(0.755)	(0.221)	(0.069)	(0.246)
FE$_{ist}$	Yes	Yes	Yes	Yes	Yes	Yes
FE$_{jst}$	Yes	Yes	Yes	Yes	Yes	Yes
FE$_{ij}$	Yes	Yes	Yes	Yes	Yes	Yes
Observations			6,331,053			
R-squared			0.806			

Notes: Robust standard errors clustered at the origin-destination level. a p<0.01, b p<0.05, c p<0.1.
Source: Fortanier (2018); Borchert et al. (2021); Egger and Larch (2008); and Head et al. (2010).

GVCs-related considerations

An important element in the analysis of trade in services for Africa is to understand its position along the production lines of GVCs and the evolution over time with respect to other countries and trade in goods. We take the upstreamness index from Antràs et al. (2012) which measures the distance of each industry from final use. This has been constructed starting from input-output tables from the US. However, comparing it to the same index for the EU countries, it shows a very large correlation, meaning that the ranking of products in terms of upstreamness tends to be quite similar across countries. Therefore, it should be acceptable using an upstreamness index from the US to check the position of Africa in GVCs. We measure the upstreamness for each country and year, U_{it} as the weighted average of the upstreamness of the products exported by country *i* at time *t* using the share of exports of each product/service as weight and the upstreamness index of Antràs et al. (2012), U_p.

Analytically:

$$U_{it} = \sum_p \left(\frac{exp_{ipt}}{\sum_p exp_{ipt}} * U_p \right) \quad (5)$$

Since U_p does not vary over time, the dynamics of U_{it} are entirely generated by the change in the composition of services exports during the period of analysis. It is important to highlight that the interpretation of upstreamness varies across goods and services. For goods, having exports which are consistently farther from the final consumer is negative because it highlights a situation in which exports are concentrated on raw materials and inputs only, thus lacking the capacity of transforming inputs to final outputs and missing an important stage of value-added creation. For services, being more upstream means providing high-skilled services for the production of final products such as engineering, management, architectural, and financial services; while being more downstream means offering less skill-intensive services such as accommodation, personal, or construction services. Therefore, the skill content, and possibly the value-added created, increases with the distance from the final consumer. Table A3 (in the appendix) shows the values of the upstreamness index from Antràs et al. (2012) for services, and Table A5 (in the appendix) the correspondence table for the different industry classifications.

Figure 8: Upstreamness over time

Notes: Panel A plots the ranking in the average upstreamness index for different continents in 2002 and 2016 for services. Panel B does the same for goods.
Source: Antràs et al. (2012); Fortanier (2018); and Borchert et al. (2021).

The results are depicted in Figure 8, making a raking based on aggregating across different continents for the years 2002 and 2016.[10] For services (Panel A), African exports show to be very close to final demand. This means that Africa lags behind in the exports of high value-added services which tend to be more upstream. However, the trend is upwards highlighting that there is a tendency to increase upstreamness. Regarding the other continents, North America is the one for which exports of services are more upstream, thus specializing mostly in high-skilled ones. With respect to goods, Africa is the continent for which exports are more upstream, while Europe is the one for which exports are more downstream. Therefore, distance from final demand is important for Africa and its involvement in GVC shows to be limited to the most upstream parts. In terms of policy, the two graphs show that there is huge potential for trade growth and involvement in GVCs for Africa, and trade policies should point firmly in that direction.

Disentangling the upstreamness for each African country in Figure A6 (services) and Figure A7 (goods) in the Appendix, we can observe that, for services, the upstreamness of most countries has remained low and stable over the period 2002–2016. The only exceptions are Guinea, Angola, Tanzania, and Swaziland, which experienced an increase in service upstreamness; and Uganda, Zimbabwe, Kenya, and Burkina Faso which decreased their exports upstreamness. For goods (Figure A7 in the appendix), the situation is similar, with most countries remaining at the same level of export upstreamness and, with the exception of Zimbabwe, with few countries increasing it. These results suggest that the involvement of African exports into GVCs has remained quite stable over time, with services being too close to final demand and goods being too upstream with respect to what would be desirable. Therefore, the policy responses should be directed to strengthen the production and exports of those goods and services that can balance the actual situation. For both goods and services, this means to push more for high-skill intensive industries.

5 Conclusions

Trade in service is still at its infancy in Africa. Its growth started later than for other developed and developing countries and, so far, it has been concentrated mostly on more traditional and low-skilled industries. Supply and demand determinants of trade growth have remained stable during the period of analysis, while diversification and trade costs play an important role. In particular, trade liberalization in goods had positive impact on trade in services, and services showed to be more successful in reaching distant destinations than goods. Finally, African services exports tend to be concentrated on downstream low-skilled industries. These results point at the huge potential that African economies have for establishing a service-led growth to foster development.

Notes

1. This means that they are not corrected for the fact that, for the same country-pair, import and export declarations might not be exactly the same depending on the reporting country.

2. Geographical subdivision are based on the UN classification. China, Hong Kong, Japan, Korea, Macao and Mongolia are excluded from the Asia region and belong instead to the East Asia region.

3. See Socrates et al. (2021) for more information about the possible effects of AfCFTA on African countries.

4. This could be due to the different digitalization path followed by the different countries (e.g., de Melo & Solleder, 2021).

5. Following the classification by Eckert et al. (2019) “Skilled and Tradeable” sectors are industries that are knowledge-intensive and increasingly traded domestically and abroad. Specifically, they include: professional services, management of companies, finance and insurance, information, and real estate. Table A4 (in the appendix) reports this classification.

6. Table A4 (in the appendix) reports the sectors which belong to this category.

7. The proof is trivial since if there is only a product, the sum of the logs and the log of the sum is the same; but if there are more, J is always non-zero, i.e., it increases in the number of products.

8. The results for Eijs are not shown since they are hardly interpretable.

9. Unfortunately, there are no RTAs which include services only, thus it is impossible to identify the role of Service RTAs alone.

10. Figure A5 (in the appendix) shows the evolution in all the years for all continents.

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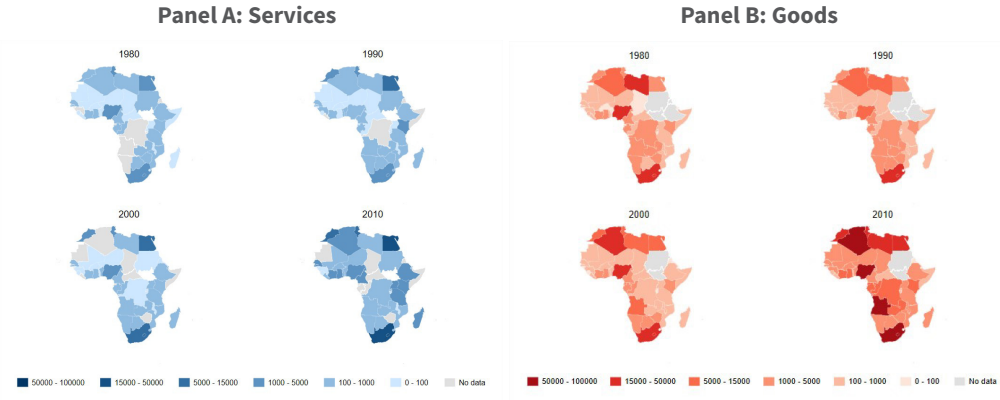
Appendix

Additional tables and figures

Figure A1: Change in region contribution to trade in services

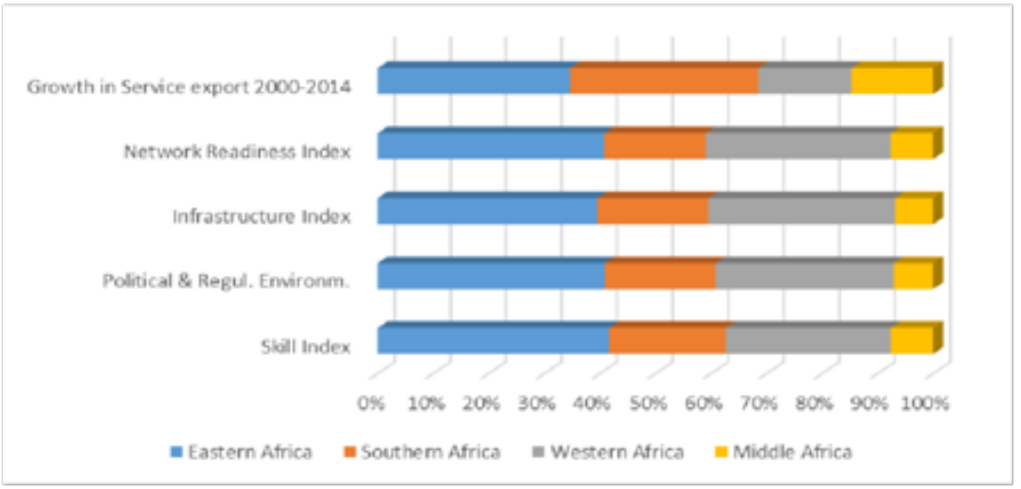
Note: This figure plots the contribution of each continent to trade in services for 1980 and 2013.
Source: Loungani et al. (2017).

Figure A2: Geographic evolution of trade in services and trade in goods in Africa



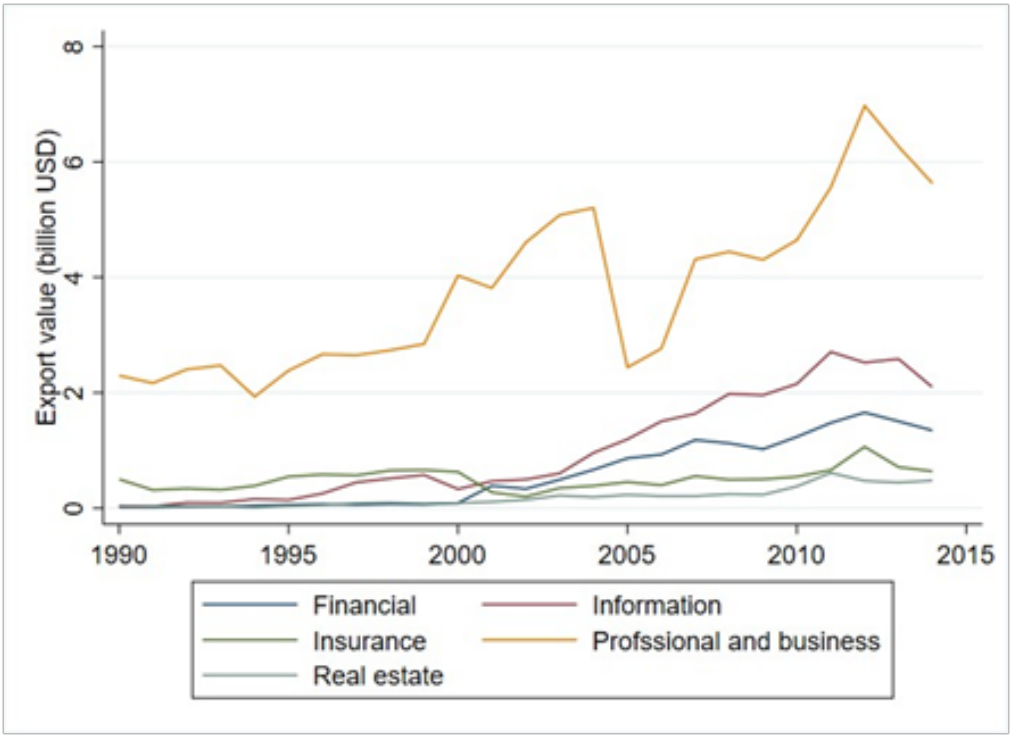
Note: This figure plots the contribution of each African country to trade in services (Panel A) and goods (Panel B) for 1980, 1990, 2000, and 2010.
Source: Loungani et al. (2017); and UNCTAD Statistics (2022).

Figure A3: Export in services growth and network readiness index - by African regions



Note: This figure shows the correlation between the overall growth in services export and the Network Readiness index and its components.
Source: Loungani et al. (2017); and World Bank (2016).

Figure A4: Skilled and tradeable sectors – Decomposition, 1990-2014



Note: This figure plots the services exports for each ST services category during the period 1990–2014.
Source: Loungani et al. (2017); and Eckert et al. (2019).

Table A1: Skilled and tradeable sectors

	Financial	Information	Insurance	Professional and Business	Real Estate
	South Africa	South Africa	South Africa	Nigeria	Senegal
	Côte d'Ivoire	Kenya	Cameroon	South Africa	South Africa
2000-2009	Swaziland	Senegal	Côte d'Ivoire	Cameroon	Guinea
	Mauritius	Côte d'Ivoire	Congo	Mauritius	Côte d'Ivoire
	Congo, (DRC)	Ethiopia	Botswana	Côte d'Ivoire	Madagascar
	South Africa	South Africa	South Africa	South Africa	Uganda
	Kenya	Kenya	Zambia	Mauritius	Burkina Faso
2010-2014	Mauritius	Mauritius	Kenya	Ghana	Mauritius
	Burkina Faso	Mali	Mauritius	Cameroon	Swaziland
	Côte d'Ivoire	Burkina Faso	Cameroon	Tanzania	Senegal

Note: This table reports the top five African exporters for each of the ST services categories for the periods 2000–2009 and 2010–2014.
Source: Loungani et al. (2017); and Eckert et al. (2019).

Table A2: Policy determinants of trade for Africa

	(1)	(2)	(3)	(4)	(5)	(6)
	Services			Goods		
	log Exp$_{ijt}$	**log # Prod**$_{ijt}$	**log Int**$_{ijt}$	**log Exp**$_{ijt}$	**log # Prod**$_{ijt}$	**log Int**$_{ijt}$
$RTA_{Gonlyijt}$	0.0664[b]	-0.0100	0.0612[b]	0.0925[a]	0.0390[a]	0.0535[b]
	(0.0308)	(0.009)	(0.030)	(0.029)	(0.009)	(0.027)
$RTA_{Gonlyijt}$ *$Africa_i$	-0.1740[c]	-0.0124	-0.151c	-0.0065	-0.0394c	0.0329
	(0.090)	(0.019)	(0.089)	(0.094)	(0.023)	(0.089)
$RTA_{Gijt\&S}$	-0.0177	0.0150b	-0.0237	0.00703	-0.0488[a]	0.0559[b]
	(0.026)	(0.007)	(0.025)	(0.026)	(0.007)	(0.023)
$RTA_{Gijt\&S}$*$Africa_i$	-0.8620[a]	-0.1360	-0.7390[a]	0.9400[a]	-0.1100	1.050[a]
	(0.222)	(0.112)	(0.224)	(0.156)	(0.076)	(0.145)
FE_{it}	Yes	Yes	Yes	Yes	Yes	Yes
FE_{jt}	Yes	Yes	Yes	Yes	Yes	Yes
FE_{ij}	Yes	Yes	Yes	Yes	Yes	Yes
Observations	281,921	287,385	281,921	455,072	455,072	455,072
R-squared	0.948	0.836	0.948	0.879	0.849	0.845

Notes: Robust standard errors clustered at the origin-destination level. [a] p<0.01, [b] p<0.05, [c] p<0.1.
Source: Fortanier (2018); Borchert et al. (2021); Egger and Larch (2008); and Head et al. (2010).

Table A3: Upstreamness for services sectors

Sector	Upstreamness
Personal	1.19
Government	1.33
Financial	1.57
Computer	2.07
Transport	2.10
Travel	2.27
Insurance	2.45
Business	2.50
Royalties	3.31

Notes: This table reports the values of the upstreamness Index for the services sectors from Antràs et al. (2012).

Table A4: Business service and skilled and tradeable sectors

Industry Name	Business Services	STS Sectors
Auxiliary insurance services	0	1
Charges for the use of intellectual property n.i.e.	1	0
Computer services	0	1
Construction abroad	0	1
Construction in reporting economy	0	1
Direct insurance	0	1
Information services	0	1
Pension and standardized guaranteed services	0	1
Professional and management consulting services	1	1
Reinsurance	0	1
Research and development services	0	1
Technical, trade-related, and other business services	1	1
Telecommunications services	0	1
Insurance and pension services	0	1
Telecommunications, computer, and information services	0	1
Other Business Services	1	1
Construction	0	1
Computer and Information, Other	0	1
Financial services	0	1
Other business, Other	1	1
Financial intermediation services	0	1
Insurance and pension, Other	0	1
Financial	0	1
Manufacturing, Other	1	0
Insurance and pension	0	1
Financial, Other	0	1
Other business	1	1

Table A5: Correspondence table

Industry Code	Industry Name	Industry Code	Industry Name
01	Agriculture, hunting, forestry and fishing	-	-
02	Mining and quarrying (energy)	-	
03	Mining and quarrying (non-energy)	-	-
04	Food products, beverages and tobacco	1-2-3	Food, Drinks and Beverage, Tobacco
05	Textiles, textile products, leather and footwear	4	Textiles and Apparel
06	Wood and products of wood and cork	5	Wood
07	Pulp, paper, paper products, printing and publishing	6	Paper
08	Coke, refined petroleum products and nuclear fuel	8	Petroleum
09	Chemicals excluding pharmaceuticals	9	Chemicals
10	Pharmaceuticals	9	Chemicals
11	Rubber & plastics products	10	Rubber and Plastics
12	Other non-metallic mineral products	11	Non-Metallic Minerals
13	Iron & steel	12	Iron and Steel
14	Non-ferrous metals	12	Iron and Steel
15	Fabricated metal products, except machinery & equipment	12	Iron and Steel
16	Machinery & equipment, nec	13	Machinery
17	Office, accounting & computing machinery	13	Machinery
18	Electrical machinery & apparatus, nec	14	Electrical Machinery
19	Radio, television & communication equipment	14	Electrical Machinery
20	Medical, precision & optical instruments	15	Precision Instruments
21	Motor vehicles, trailers & semi-trailers	16	Motor Vehicles

continued next page

Table A5 Continued

Industry Code	Industry Name	Industry Code	Industry Name
22	Building & repairing of ships & boats	16	Motor Vehicles
23	Aircraft & spacecraft	16	Motor Vehicles
24	Railroad equipment & transport equip nec.	16	Motor Vehicles
25	Manufacturing nec; recycling (include Furniture)	17	Furniture
26	Production, collection and distribution of electricity	-	
27	Manufacture of gas; distribution of gaseous fuels through mains	-	-
28	Steam and hot water supply	-	-
29	Collection, purification and distribution of water	-	-
30	Construction	3	Construction
31	Wholesale & retail trade; repairs	-	-
32	Hotels & restaurants	9	Personal and Cultural Services
33	Land transport; transport via pipelines	1	Transport
34	Water transport	1	Transport
35	Air transport	1	Transport
36	Supporting and auxiliary transport activities; activities of travel agencies	2	Travel
37	Post & telecommunications	6	Telecommunications, computer, and information services
38	Finance & insurance	4-5	Insurance and Finance
39	Real estate activities	-	-
40	Renting of machinery & equipment	7	Charges for the use of intellectual property n.i.e.
41	Computer & related activities	6	Telecommunications, computer, and information services
42	Research & development	8	Other business services

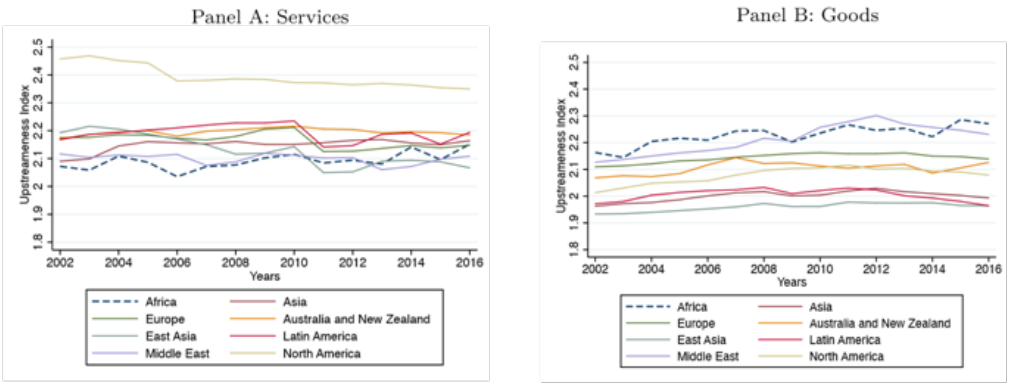
continued next page

Table A5 Continued

Industry Code	Industry Name	Industry Code	Industry Name
43	Other Business Activities	8	Other business services
44	Public admin. & defence; compulsory social security	10	Government Services
45	Education	9	Personal and Cultural Services
46	Health & social work	9	Personal and Cultural Services
47	Other community, social & personal services	9	Personal and Cultural Services
48	Private households with employed persons & extra-territorial organisations & bodies	10	Government Services

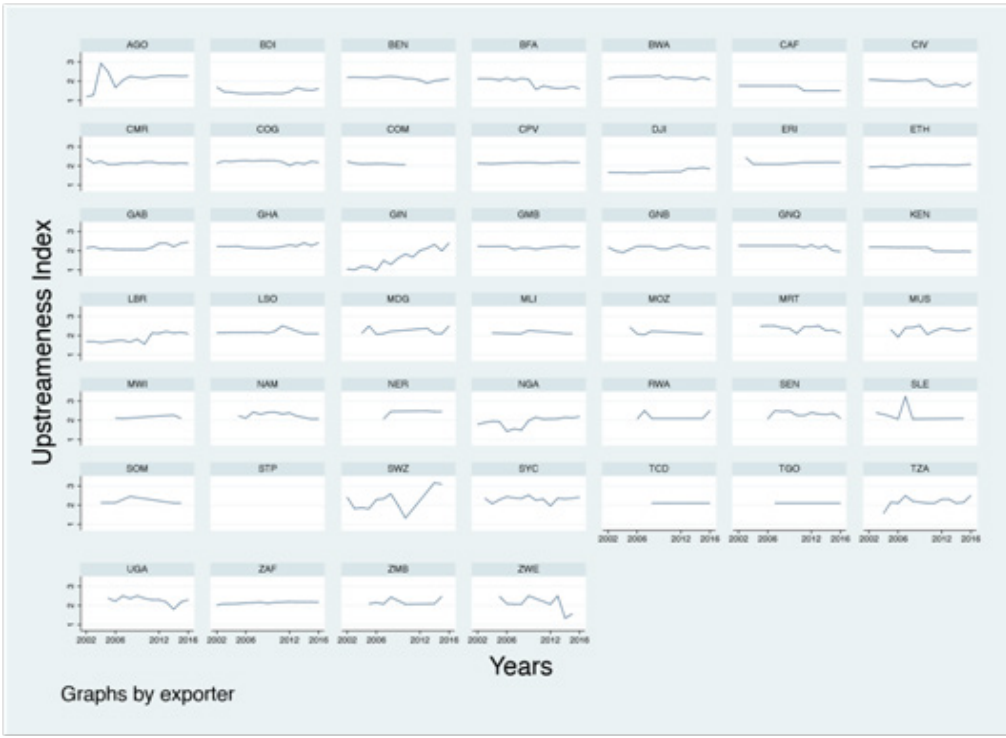
Notes: This table reports the correspondence of service industries between Antràs et al. (2012) and the present study.

Figure A5: Upstreamness over time



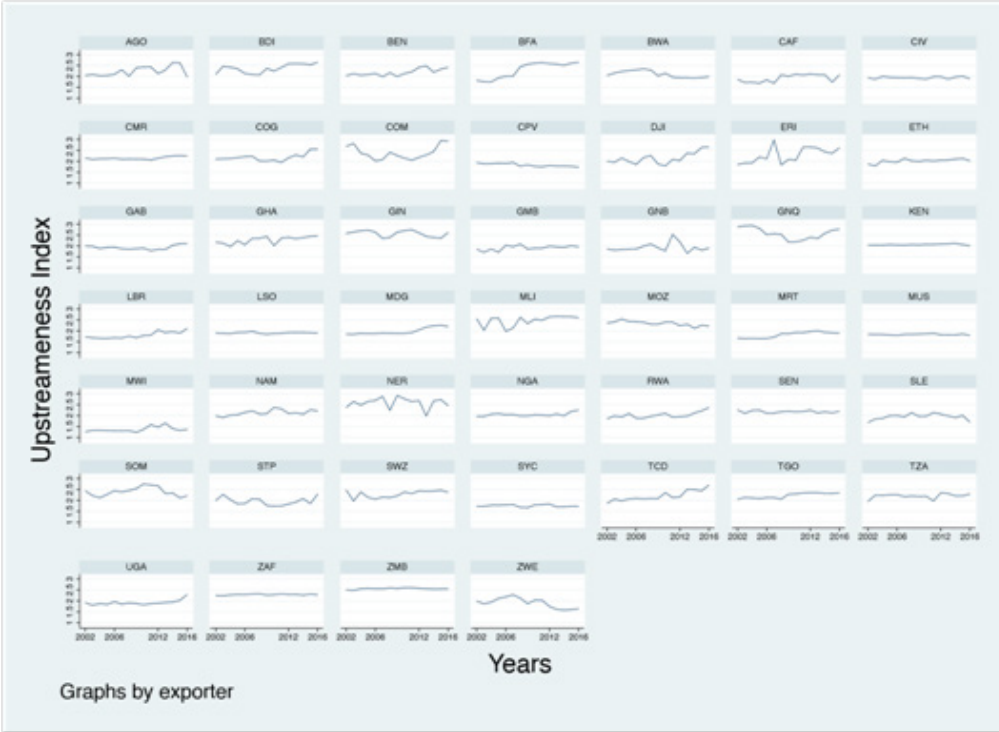
Notes: Panel A plots the average upstreamness index for different continents during the period 2002–2014. Panel B does the same for goods.
Source: Antràs et al. (2012), Fortanier (2018); and Borchert et al. (2021).

Figure A6: Services upstreamness over time for African countries



Note: This figure plots the upstreamness index of services exports for each African country during the period 2002–2016.
Source: Antràs et al. (2012); and Fortanier (2018).

Figure A7: Goods upstreamness over time for African countries



Note: This figure plots the upstreamness index of goods exports for each African country during the period 2002–2016.
Source: Antràs et al. (2012); and Borchert et al. (2021).

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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Contact Us
African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org