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Services' trade in Africa: Structure and growth

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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 liberalisation increased services 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 that 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.

KEYWORDS
Africa, trade in services

1 | INTRODUCTION

According to the World Trade Organization (World Trade Organization, 2019), trade in services has outpaced trade in goods for the past three decades, offering a significant opportunity for growth in developing countries. This has been confirmed by the United Nations Conference on Trade and Development (UNCTAD), which reported that services account for over 50% of global trade and that services trade has been growing at a faster rate than trade in goods (UNCTAD, 2021). There are several reasons for this trend. First, many services are intangible and can be easily exchanged online (e.g. Borchert & Mattoo, 2010; Francois & Hoekman, 2010). Second, the production of services is often less capital-intensive compared to goods, meaning that lower investments are required in infrastructure and machinery (e.g. Ariu, 2016b; Breinlich & Criscuolo, 2011). Finally, economies of scale play a lesser role in service production and can be achieved through branching, franchising, and digital market access, meaning that services are less dependent on physical proximity than previously believed (Nayyar et al., 2021). As a result of these factors, exporting services requires less investment and is potentially accessible to a larger pool of firms compared to exporting goods.[1] However, we know very little about the participation of developing countries, especially in Africa, in services trade and global value chains due to a 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., Baccini et al., 2022; Fan et al., 2021) 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. While trade in services encompasses many aspects that could be conducive to economic development, such as increased productivity in the manufacturing sector due to access to services imports (Arnold et al., 2008; Fiorini et al., 2022),[2] this paper specifically focuses on service exports as a potential driver of growth. This is particularly relevant for developing countries, as service exports can help generate foreign exchange earnings and directly contribute to job creation, and can help address the issue of balance of payments deficits that many developing countries face.

Results indicate that there is huge scope for exports in services to grow and foster development. An analysis of African export flows performed using the newly available data from Loungani et al. (2017) shows that African economies joined the trade in services boom later than developed and other developing countries, and still today its exports are concentrated on low-skilled services mostly. The average growth rate was five percentage points lower than the world average in the period 1980–1999, and three percentage points lower in the period 2000–2014; moreover, Africa's contribution to world exports was less than 1% of the total. In terms of sectoral specialisation, Africa exports 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

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[1]Two important things must be noted. First, this potential is still little exploited also in developed countries, in which trade in services still represents only a minor part of export values and exporters. Second, increasing imports of cheaper or better quality services inputs can also be a source of growth for manufacturing and the whole economy (e.g., Arnold et al., 2016; Francois, 1990). However, our data does not allow us to analyse this channel.

[2]Other studies have highlighted the importance of service imports for economic development, see e.g. Borchert and Mattoo (2010) and Francois and Hoekman (2010).

the huge growth of high-skilled services observed worldwide that led other developing countries such as Asia to develop.

To understand these patterns, we combine bilateral trade flows for services from Fortanier (2018) with bilateral goods trade data from Borchert et al. (2021), and we decompose aggregate trade growth into its different components using the methodology developed by Redding and Weinstein (2019). This technique allows to disentangle supply, demand, diversification, and trade costs components 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 but also for the Rest of the World. Instead, the diversification of the services portfolio is increasing its importance. This means that on average there are initial signs that African countries are starting the process of adding to the traditional services (such as transportation) also more high-skilled ones (such as business services) that represent the fastest growing component of trade (World Trade Organization, 2019).

To gain more insights on the bilateral trade costs and analyse further the service diversification determinants, we decompose aggregate export values into number of products and average exports per product, and we run similar gravity equations that separate 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 liberalisation has a positive effect on services trade as well, and that Africa exports of services suffer less negative effects of distance. The first finding is due to the complementarity between goods and services (e.g., Aquilante & Vendrell-Herrero, 2021; Ariu et al., 2019, 2020; Cadestin & Miroudot, 2020; Crozet & Milet, 2017a, 2017b). Therefore, by liberalising goods trade all the services which are complementary to them also grow along. For example, transport, maintenance, and technical services are instrumental in 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 service and goods exports in GVCs. We take the upstreamenss index developed by Antràs et al. (2012) and calculate the weighted average of the upstreamenss of services and goods exports for African countries and compare it with the Rest of the World. We find that African services are less upstream and goods are more upstream than those exported by other countries. This indicates that African countries specialise in services that 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). 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. Interestingly, though, trends for services indicate that upstreameness is slowly increasing, especially driven by Guinea, Angola, and Tanzania.

Overall, 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 signs 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 foresee-able 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., Ariu, 2016b; Breinlich & Criscuolo, 2011; Federico & Tosti, 2017; Gaulier et al., 2011; Jensen, 2011; Kelle, 2013; 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., Anderson et al., 2018; Ariu, 2016a; Francois & Hoekman, 2010). 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 them to goods trade.

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

This paper is structured as follows. Section 2 provides an historical perspective on the growth of trade in services. Section 3 analyses the determinants of services trade growth and the structure of service GVCs. Finally, Section 4 concludes.

2 | AN HISTORICAL OVERVIEW OF TRADE IN SERVICES IN AFRICA

Here, we provide an historical overview of trade in services for Africa in comparison with other regions,[3] highlighting the main stylised facts. To perform the analysis, we use the data constructed by Loungani et al. (2017) that record exports of services for 192 countries during the period 1970–2014. The dataset is organised at the exporter-service-year level and it accounts for 66 categories of services (BPM6) and for modes 1, 2, and 4, but we are not able to distinguish across them[4] We group service categories in 10 main ones and we keep only the years starting

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[3]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.

[4]Trade modes fore services are defined in the GATS. Mode 1 "Cross border supply" is when a service is produced in one country and consumed in another one; Mode 2 "Consumption abroad" is when services are consumed in the country where they are produced; Mode 3 "Commercial presence" is when a service supplier sets a foreign office in order to provide services; Mode 4 "Presence of natural person" is when a person provides the service in a foreign country.
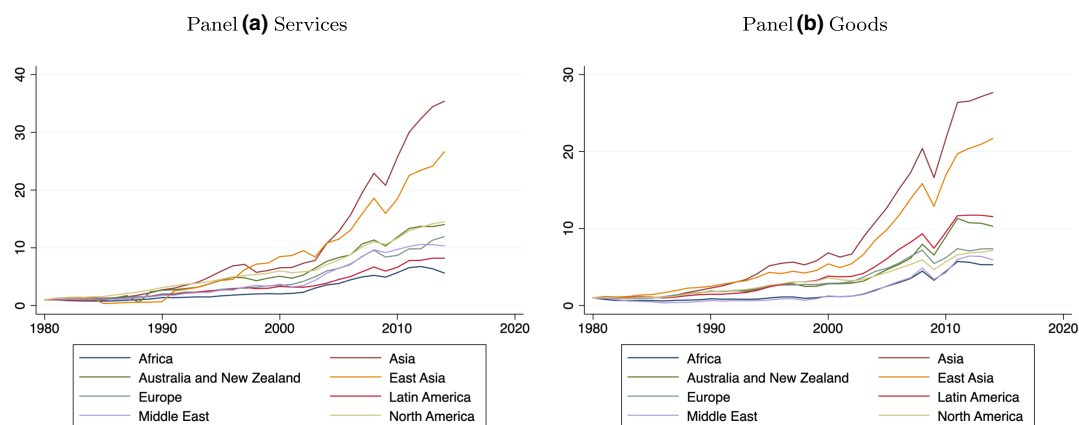
Panel **(a)** Services   Panel **(b)** Goods

FIGURE 1 Trade in services growth by region, 1980 normalised to one. *Note*: This figure shows the evolution of services (panel a) and goods (panel b) exports normalised in 1980 for different continents during the period 1980–2016. *Data source*: Loungani et al. (2017) and UNCTAD Statistics (2022). [Colour figure can be viewed at wileyonlinelibrary.com]

from 1980 to have a stable number of African countries. To compare the results of services with goods trade, we make use of the the UNCTAD Statistics (2022) database that covers for the same time period exports of goods at the country level.

2.1 | 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 tradable (e.g., Ariu & Mion, 2017; Benz et al., 2022; Freund & Weinhold, 2004), 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.[5]

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[5]Figure S1 in Appendix S1 plots the same graphs for imports and exports of services in the period 1995–2012 using data from the Balanced Trade in Services Dataset (BaTIS) (Fortanier, 2018).
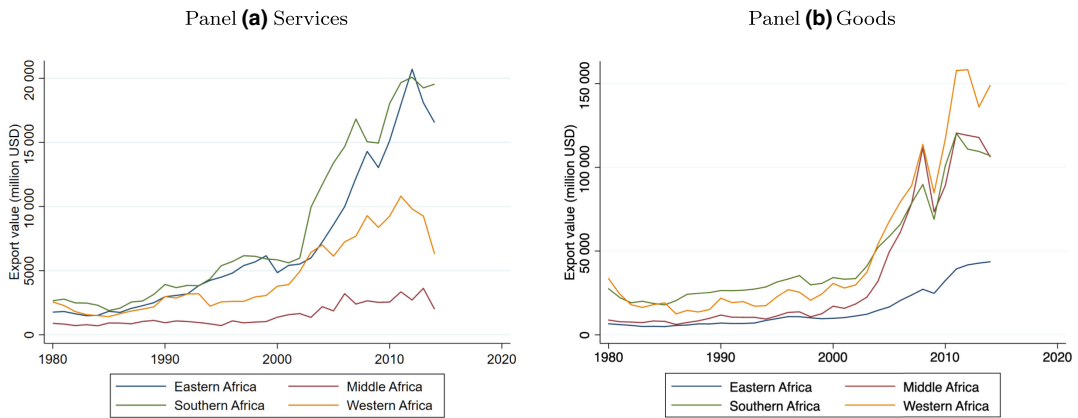
Panel **(a)** Services

Panel **(b)** Goods

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 1980–2014. The scale of the vertical axes in the two figures is different. *Data source*: Loungani et al. (2017) and UNCTAD Statistics (2022). [Colour figure can be viewed at wileyonlinelibrary.com]

Africa appears to have been the least involved in globalisation 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 least to trade in services in the 2010s, accounting only for 1% to the total value of service exports (Figure S2 in Appendix S1). 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.[6]

Zooming in on Africa, the overall trends in trade in services for African economies hide significant geographic and sectoral heterogeneity.[7] Panel a of Figure 2, plots the value of service exports for different African regions while panel b provides a visualisation of the data for export in goods for comparison. For services, it is apparent from the picture that the growth was not homogeneous in the continent, rather it was concentrated in East and Southern Africa. This is interesting since exports in goods show a different dynamic: first, there is much less geographical variation regional trends of goods' export; second, Eastern Africa is the region that displays lower levels of growth throughout the period. Figure S3 in Appendix S1 zooms further in and shows the geographic distribution of service and goods exports in Africa, and how this distribution evolved

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

[7] This could be due to the different digitalization path followed by the different countries (e.g., de Melo & Solleder, 2021).
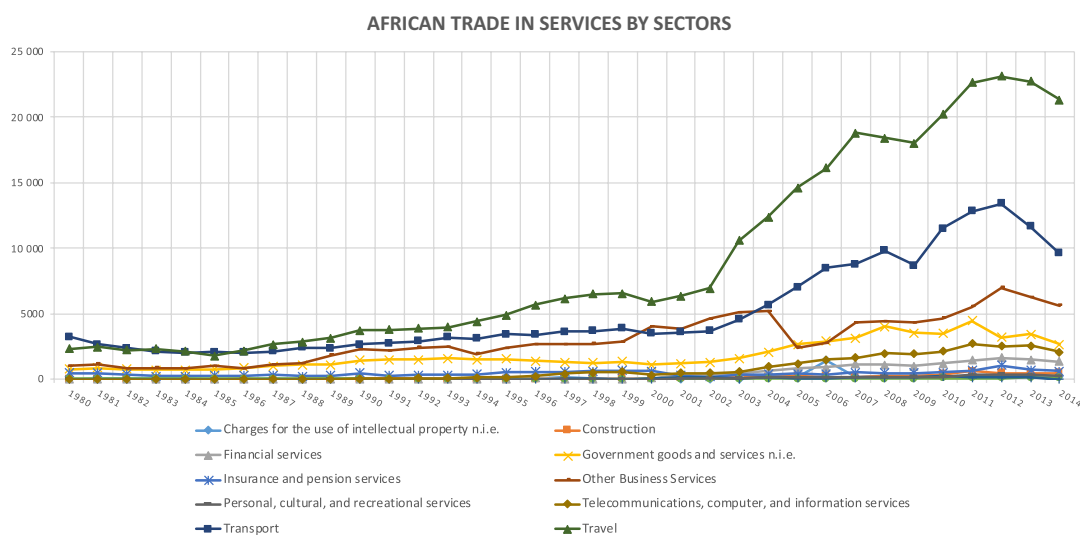
FIGURE 3 African trade in services: Sectoral evolution. *Note*: This figure shows the evolution of services exports by sector during the period 1980–2016. *Data source*: Loungani et al. (2017). [Colour figure can be viewed at wileyonlinelibrary.com]

over time. While South Africa, Egypt, Tunisia and Nigeria have been the top contributors to African service exports since the 80s, East-African countries like Ethiopia, Kenya, Uganda and Tanzania have began playing a major role in the mid 2000s jointly accounting approximately for 25% of service exports in 2014. With relative to goods, services are much more evenly spread across African countries.

2.2 | Africa specialises mostly in low-skill services

Looking at the service 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 10 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 (Atolia et al., 2018). The limited availability of high-skilled labor and related high-tech infrastructure likely limited the expansion of productivity-boosting services. Figure S4 shows a positive correlation between service 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 digitalisation front. If we restrict our attention to "Skilled and Tradable" sectors (STS), those that led employment and wage growth in developed economies since the 1980s, we clearly see that Africa is lagging behind.[8] Figure 4 shows the evolution of STS sectors

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[8]Following the classification by Eckert et al. (2019) "Skilled and Tradable" 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 S4 in Appendix S1 reports this classification.
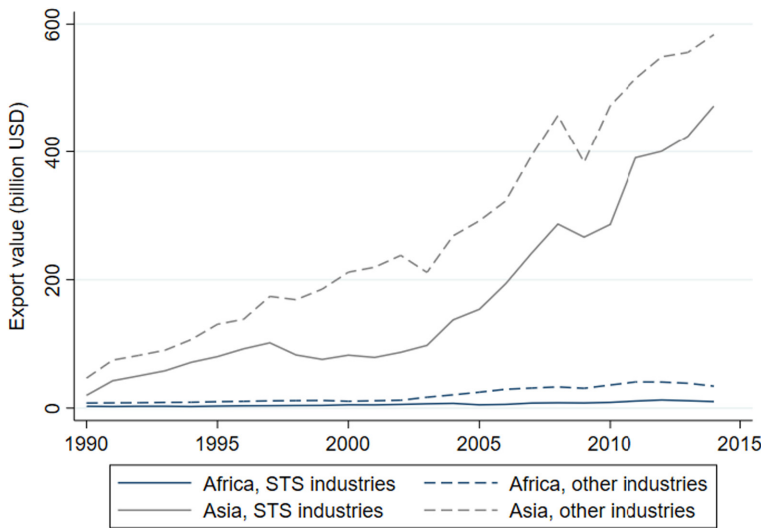
FIGURE 4   Skilled and tradable sectors. *Note*: This figure shows the evolution of services exports for Asia and Africa distinguishing across STS industries and other industries during the period 1980–2016. *Data sources*: Loungani et al. (2017) and Eckert et al. (2019). [Colour figure can be viewed at wileyonlinelibrary.com]

in Africa and Asia. The picture highlights how trade skill-intensive service industries is still underdeveloped compared to the boom that those industries experienced in Asia starting from the mid 2000s. Table S1 in Appendix S1 reports the top 5 exporting countries in STS industries separately for the 2000–2009 and 2010–2015 periods. Unsurprisingly, South Africa, the most developed economy, is almost invariably the top contributor. Kenya and Mauritius also seem on the way of specialising in skill-intensive industries while other countries exported only in a few of STS sectors.[9]

Figure S5 in Appendix S1 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.[10] The figure reports the top 5 exporting countries in each decade and their share of export. The figure 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 5 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 service 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 exporter in the tertiary sector; however, after 2011 in the height of the financial crisis, it experienced a sharp decrease in its service exports, mainly due to a reduction of Nigerian imports from the United States, its the main trading partner. 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

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[9]This finding is in line with results by Were and Odongo (2023). Using a revealed-comparative-advantage approach they find that Sub-Saharan Africa still holds a comparative advantage in traditional sectors, with the only exception being Kenya and Nigeria who started developing comparative advantage in financial services.

[10]Table S4 in Appendix S1 reports the sectors which belong to this category.
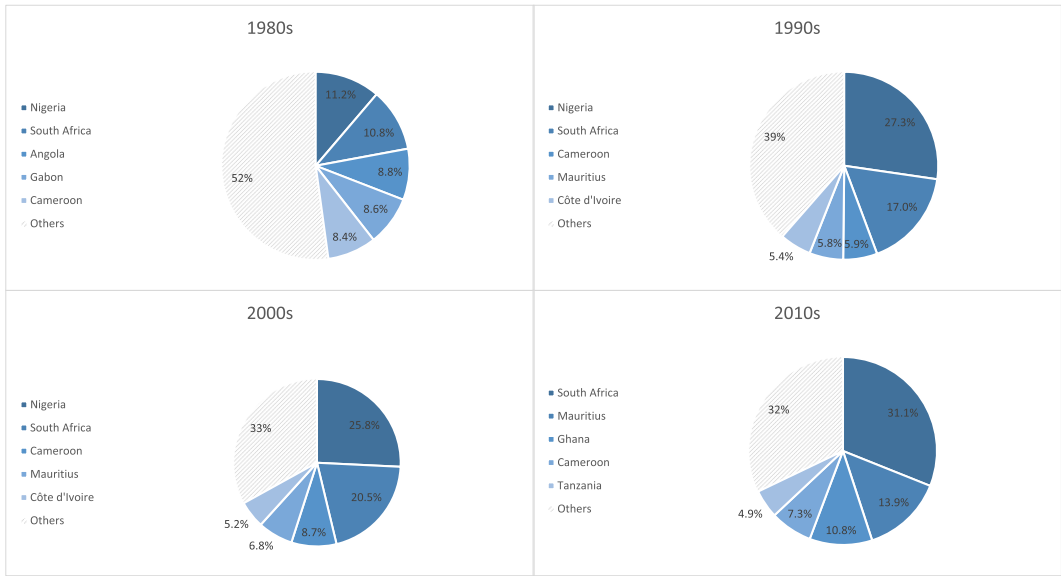
FIGURE 5 African trade in services: Business services. *Note*: This figure shows the top 5 African service exporters in 1980, 1990, 2000 and 2010. *Data source*: Loungani et al. (2017). [Colour figure can be viewed at wileyonlinelibrary.com]

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.

Overall, the results of this section show that Africa is still a marginal player in the global market of trade in services and that service 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 service 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 digitalisation front (de Melo & Solleder, 2021).

3 | 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 service 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.

For this analysis, we take advantage of the destination dimension present in the Balanced Trade in Services Dataset (BaTIS) from Fortanier (2018). This dataset records trade in services from 1995 to 2016 at the origin–destination-service-year level for modes 1, 2, and 4, but we are

not able to distinguish across them. The classification of services follows the usual EBOPS categories that we aggregate in the same 10 categories we previously used for the Loungani et al. (2017) data. The crucial advantages of the BaTIS 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.[11] 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 for the period 2002–2016 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.

3.1 | 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 a theory-based sectoral-level log-linear gravity regression of the style:

$$lnx_{ijs} = \gamma_{is} + \delta_{js} - \alpha_1 \tau_{ij} + \varepsilon_{ijs} \tag{1}$$

where x_{ijs} is import in destination j from origin i in sector s, γ_{is} and δ_{js} are, respectively, origin-sector and destination-sector fixed effects which account for the multilateral resistance to trade (Anderson & van Wincoop, 2003), and τ_{ij} captures the bilateral trade costs (proxied by the log of distance); we can aggregate trade flows following Redding and Weinstein (2019) as

$$lnX_{ij} = -T_{ij} + \Gamma_{ij} + \Delta_{ij} + J_{ij} + E_{ij} \tag{2}$$

where X_{ij} is the total import in destination j from origin i, Γ_{ij} and Δ_{ij} 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, E_{ij} is the sectoral average of the error terms. 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. To see why, imagine that the data includes only a product, then the sum of the logs and the log of the sum is the same and J is equal to zero. Instead, if there are more products, J is always non-zero. The value of J depends on the difference between the log share of import of a product s from origin j in total imports and the log import share of s from a particular origin j (Redding & Weinstein, 2019). So, the more uneven trade across products and countries, the higher is the absolute value of J. One important thing to notice is that African countries typically represent a tiny fraction of the overall imports of a destination, so, the log of these shares are negative and also the J term can assume negative values.

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[11]This means that they are not corrected for the fact that, for the same country-pair, import and export declarations might be not exactly the same depending on the reporting country.
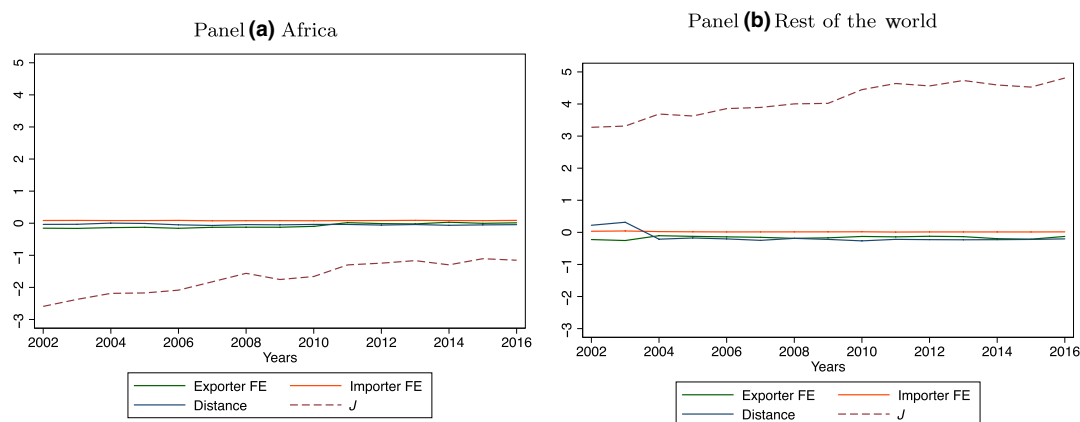
FIGURE 6 Supply, demand and bilateral components of aggregate gravity for services. *Note*: (Panel a) represents the contribution of supply, demand, bilateral costs and *J* for trade in services in Africa over the period 2002–2016 using the methodology of Redding and Weinstein (2019). (Panel b) shows the same for the Rest of the World. *Data sources*: Fortanier (2018) and Head et al. (2010). [Colour figure can be viewed at wileyonlinelibrary. com]

Figure 6 shows for the years 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. For both, the contributions of distance, supply ad demand are extremely stable over the period of analysis. Instead, the diversification index *J* has positively fostered service flows for the rest of the world, while it has a negative impact for Africa. This suggests that African countries export too few services with respect to what would be necessary in order to contribute positively to trade.

To corroborate this finding, we perform a simple exercise: we draw 100 random subsamples of our data (each of equal size) and, for each, we estimate the contribution of *J* to total trade. We find that the contribution of *J* to trade is negative for low values of *J* and becomes positive as *J* increases. This means that African countries lack the level of diversification in services, and this represents a limit for service exports growth for Africa. This is in line with the findings of the previous section: African countries export only traditional services that are growing at a slower pace than the high-skilled ones. The good news is that trends are positive, pointing at an increasing diversification, which should lead in the foreseeable future to a positive contribution.

We leverage availability of data on goods trade flows for the same time period as a benchmark to evaluate our findings for services. The outcomes are presented in Figure 7. Notably, the results for manufacturing exhibit a striking resemblance to those for services. In both Africa (panel a) and the rest of the world (panel b), factors related to demand, supply, and bilateral relations demonstrate relative stability. As for services, the contribution of the diversification index is negative for Africa, while positive for the Rest of the World. Also in this case, the upward trends indicate that product diversification plays a significant role in trade growth. Overall, these findings highlight the lack in export diversification among African economies compared to the rest of the world, which poses a significant challenge to their limited contribution to trade growth.
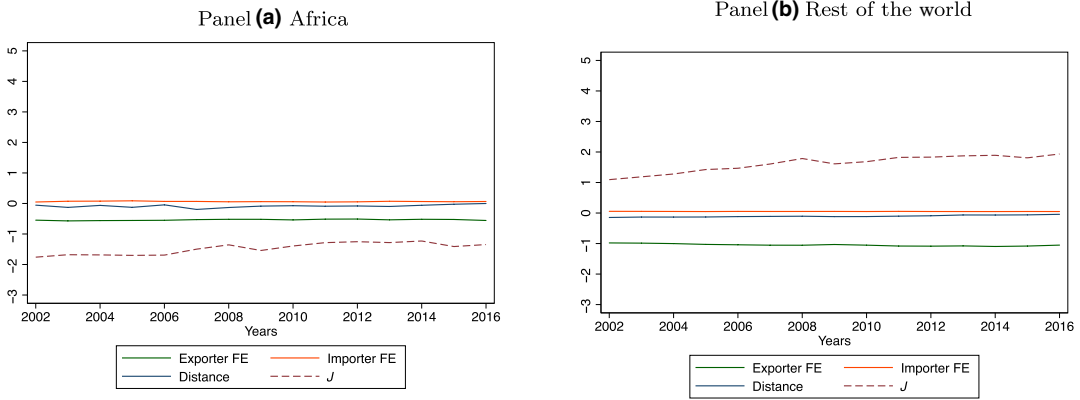
FIGURE 7 Supply, demand and bilateral components of aggregate gravity for goods. *Note*: (Panel a) represents the contribution of supply, demand, bilateral costs and *J* for trade in goods in Africa over the period 2002–2016 using the methodology of Redding and Weinstein (2019). (Panel b) shows the same for the Rest of the World. *Data sources*: Borchert et al. (2021) and Head et al. (2010). [Colour figure can be viewed at wileyonlinelibrary.com]

After conducting an analysis of the contribution of each component of Equation (2) to total trade, we aim to understand the factors driving them by employing separate gravity regressions for each component, represented by the system of Equations (3):

$$
\begin{aligned}
T_{ij} &= \gamma_i^T + \delta_j^T + \alpha^T \tau_{ij} + \varepsilon_{ij}^T \\
\Gamma_{is} &= \gamma_i^\Gamma + \delta_j^\Gamma + \alpha^\Gamma \tau_{ij} + \varepsilon_{ij}^\Gamma \\
\Delta_{js} &= \gamma_i^\Delta + \delta_j^\Delta + \alpha^\Delta \tau_{ij} + \varepsilon_{ij}^\Delta \\
J_{ij} &= \gamma_i^J + \delta_j^J + \alpha^J \tau_{ij} + \varepsilon_{ij}^J \\
E_{ij} &= \gamma_i^E + \delta_j^E + \alpha^E \tau_{ij} + \varepsilon_{ij}^E
\end{aligned}
\tag{3}
$$

We can examine the role of trade costs, specifically the distance coefficient α, for each of the aggregate components of Equation (2). Figure 8 displays the results for services, separately for Africa (panel a) and the rest of the world (panel b). The findings indicate that trade costs had a limited impact on the different components of aggregate trade for the rest of the world, showing relatively stable dynamics. In contrast, for Africa, it appears that there was a positive effect on importer fixed effects and a reduced negative influence of distance, suggesting an increase in demand and improved access to distant destinations. However, this was partially counteracted by a negative effect of trade costs on the diversification index, indicating a decrease in the number of exported services due to higher trade costs.

Figure 9 presents a similar analysis for goods trade. In this case, trade costs (proxied by distance) did not significantly affect demand and supply for both African countries and the rest of the world. Instead, there are positive dynamics observed for the diversification index, indicating that while trade costs had a negative impact on the number of exported products, their influence lessened over time, leading to an increase in the number of products exported by both African countries and the rest of the world. Notably, trade costs intensified the negative effect of distance. This could be attributed to the liberalisation process, particularly within Africa, which resulted in African countries increasing exports more among themselves than with non-African countries.
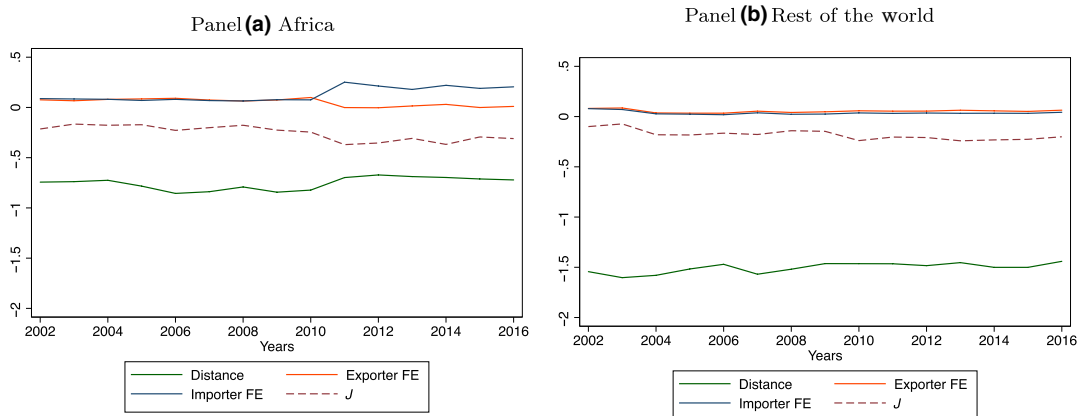
FIGURE 8 Decomposition of the distance effect in the aggregate gravity equation for services. *Note*: (Panel a) represents the contribution of supply, demand, bilateral costs and *J* for trade in services in Africa over the period 2002–2016 using the methodology of Redding and Weinstein (2019). (Panel b) shows the same for the Rest of the World. *Data sources*: Fortanier (2018) and Head et al. (2010). [Colour figure can be viewed at wileyonlinelibrary.com]
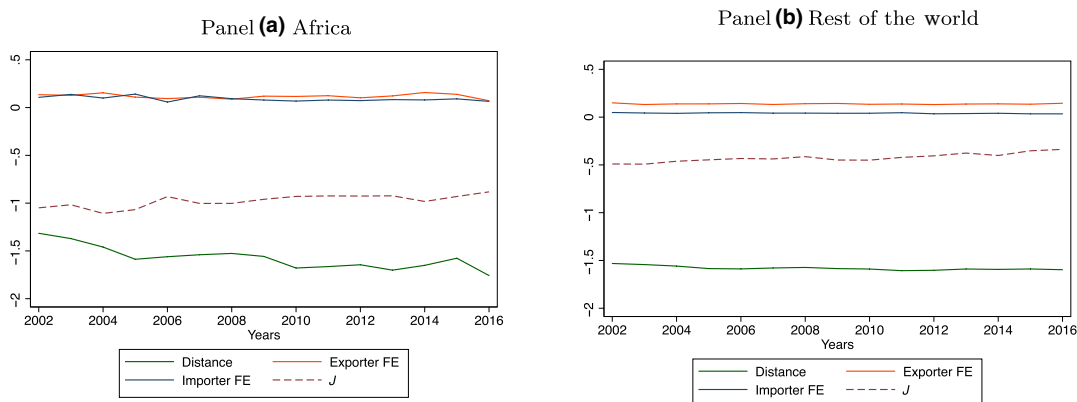
FIGURE 9 Decomposition of the distance effect in the aggregate gravity equation for goods. *Note*: (Panel a) represents the contribution of supply, demand, bilateral costs and *J* for trade in goods in Africa over the period 2002–2016 using the methodology of Redding and Weinstein (2019). (Panel b) shows the same for the Rest of the World. *Data sources*: Borchert et al. (2021) and Head et al. (2010). [Colour figure can be viewed at wileyonlinelibrary.com]

3.2 | Focus on bilateral factors

There are two notable findings from the previous subsection that warrant further investigation. First, the increasing significance of diversification for trade growth prompts the question of its underlying determinants, which is crucial for formulating appropriate policy recommendations. Second, it is puzzling that despite all the liberalisation efforts that have been put in place (at least on paper), the role of bilateral trade costs has remained relatively unchanged over time. To address 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 analyse how the product and service exports portfolio of African countries evolved over time 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 $Language_{ij}$, and having shared colonial origins, Common $Colony_{ij}$, and trade policy determinants measured as the presence of trade agreements that cover goods trade, RTA_{ijt}^{Gonly}, or both in goods and services, $RTA_{ijt}^{G\&S}$.[12]

In terms of data, 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 liberalisation 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 liberalisation dummy for goods only (RTA_{ijt}^{Gonly}) and one for both goods and services ($RTA_{ijt}^{G\&S}$).[13] Moreover, we use the usual gravity covariates from Head et al. ([2010]). The final sample for the gravity analysis spans from 2002 to 2016 to have both information on goods and services exports together and is organised at the exporter–importer-sector-year level.

Using the data just described and 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:

$$logExp_{ijt} = \gamma_0 + \gamma_1 logDist_{ij} + \gamma_2 RTA_{ijt}^{Gonly} + \gamma_3 RTA_{ijt}^{G\&S} + \gamma_4 Contig_{ij} + \gamma_5 C.Lang_{ij} + \gamma_6 C.Col_{ij} + \lambda_{it} + \delta_{jt} + \upsilon_{ijt}$$

(4)

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 liberalisation in goods can have positive effects also on trade in services, as shown by the positive and significant coefficient of RTA_{ijt}^{Gonly}. This is because there are complementarities between the two and lowering barriers on one can foster both (e.g., Aquilante & Vendrell-Herrero, [2021]; Ariu et al., [2019], [2020]; Cadestin & Miroudot, [2020]; Crozet & Milet, [2017a], [2017b]). A simple example of these mechanisms is transport services, which benefits directly from an increase in trade in goods. Therefore, in the accounting of the positive effects

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

[13]Unfortunately, it is difficult to have better measures of trade liberalisation 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).

TABLE 1 Bilateral determinants of trade.

	(1)	(2)	(3)	(4)	(5)	(6)
	Services			**Goods**		
	$\log \text{Exp}_{ijt}$	$\log \text{\# Prod}_{ijt}$	$\log \text{Int}_{ijt}$	$\log \text{Exp}_{ijt}$	$\log \text{\# Prod}_{ijt}$	$\log \text{Int}_{ijt}$
$\log \text{Distance}_{ij}$	−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_{ijt}^{Gonly}	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)
$\text{RTA}_{ijt}^{G\&S}$	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)
$\text{Common Language}_{ij}$	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)
$\text{Common Colony}_{ij}$	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	.865	.653	.863	.740	.629	.692

Note: Robust standard errors clustered at the origin–destination level.

[a]$p<.01$, [b]$p<.05$, [c]$p<.1$.

Data sources: Fortanier (2018), Borchert et al. (2021), Egger and Larch (2008) and Head et al. (2010).

of trade liberalisation 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 identifying African economies as exporters, Africa$_i$. The results in Table 2 show that distance plays a less negative role for services originating from African countries and for all trade margins. 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 liberalisation of services as well. Another factor that is particularly important for African exports is sharing a border, which is more positive

TABLE 2 Bilateral determinants of trade for Africa.

	(1)	(2)	(3)	(4)	(5)	(6)
	Services			**Goods**		
	$\log \text{Exp}_{ijt}$	$\log \text{\# Prod}_{ijt}$	$\log \text{Int}_{ijt}$	$\log \text{Exp}_{ijt}$	$\log \text{\# Prod}_{ijt}$	$\log \text{Int}_{ijt}$
$\log \text{Distance}_{ij}$	-0.738^a	-0.0312^a	-0.707^a	-1.461^a	-0.357^a	-1.105^a
	(0.013)	(0.002)	(0.012)	(0.017)	(0.006)	(0.014)
$\log \text{Distance}_{ij}{*}\text{Africa}_i$	0.211^a	0.0205^a	0.193^a	0.0798^c	-0.0908^a	0.0111
	(0.028)	(0.006)	(0.027)	(0.044)	(0.014)	(0.037)
RTA_{ijt}^{Gonly}	0.286^a	-0.0169^a	0.304^a	0.482^a	0.123^a	0.360^a
	(0.033)	(0.006)	(0.031)	(0.040)	(0.013)	(0.033)
$\text{RTA}_{ijt}^{Gonly}{*}\text{Africa}_i$	-0.0585	0.00577	-0.0482	0.560^a	0.0869^a	0.473^a
	(0.069)	(0.016)	(0.064)	(0.093)	(0.029)	(0.080)
$\text{RTA}_{ijt}^{G\&S}$	0.683^a	-0.0450^a	0.723^a	0.483^a	-0.141^a	0.624^a
	(0.031)	(0.006)	(0.030)	(0.036)	(0.013)	(0.031)
$\text{RTA}_{ijt}^{G\&S}{*}\text{Africa}_i$	0.282	0.100^b	0.196	2.347^a	0.522^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	-0.248^a	0.570^a
	(0.084)	(0.013)	(0.078)	(0.102)	(0.041)	(0.077)
$\text{Contiguity}_{ij}{*}\text{Africa}_i$	0.297^b	0.0619^a	0.231^c	0.988^a	0.556^a	0.433^a
	(0.140)	(0.024)	(0.130)	(0.185)	(0.062)	(0.151)
$\text{Common Language}_{ij}$	0.431^a	0.0330^a	0.398^a	0.937^a	0.306^a	0.631^a
	(0.025)	(0.005)	(0.024)	(0.035)	(0.011)	(0.030)
Common $\text{Language}_{ij}{*}\text{Africa}_i$	-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)
$\text{Common Colony}_{ij}$	1.016^a	0.0847^a	0.930^a	0.798^a	0.0895^a	0.709^a
	(0.071)	(0.014)	(0.066)	(0.086)	(0.032)	(0.071)
$\text{Common Colony}_{ij}{*}\text{Africa}_i$	0.0486	-0.0283	0.0775	0.189	0.355^a	-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	.866	.646	.863	.741	.632	.692

Note: Robust standard errors clustered at the origin–destination level.

[a]$p < .01$, [b]$p < .05$, [c]$p < .1$.

Data sources: Fortanier (2018), Borchert et al. (2021), Egger and Larch (2008) and Head et al. (2010).

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 the 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 S2 in Appendix S1 shows that having an RTA in goods or both is still positive and significant for both goods and services, though not for all trade margins. Therefore, trade policy is an important driver of trade in goods and services for Africa, and its effect is not attributable to other unobserved time-invariant bilateral factors.

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 service 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:

$$logExp_{ijst} = \gamma_0 + \ldots + \gamma_3^k logDist_{ij} * Africa_i * Serv_s^k + \ldots + \eta_{ist} + \sigma_{jst} + \zeta_{ij} + \chi_{ijst} \quad (5)$$

The γ_3^k 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.

3.3 | 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 upstreameness 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 United States. However, comparing it to the same index for EU countries, it shows a very large correlation, meaning that the ranking of products in terms of upstreameness tends to be quite similar across countries. Therefore, it should be acceptable using an upstreameness index from United States to check the position of Africa in GVCs. We measure the upstreameness for each country and year, U_{it} as the weighted average of the upstreameness of the products exported by country i at time t using the share of exports

TABLE 3 Differential determinants of trade for Africa.

	(1)	(2)	(3)	(4)	(5)	(6)
	log Exp$_{ijst}$					
Dep. var.	ln Dist$_{ij}$*	OnlyG$_{ijt}$*	BothG&S$_{ijt}$*	Contig.$_{ij}$*	C. Lang.$_{ij}$*	C. Col.$_{ij}$
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[a]	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[a]	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]	−0.288[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]	−0.512[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]	−0.449[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]	−0.567[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]	−0.342[a]	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]	−0.235[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]	−0.444[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	.806					

Note: Robust standard errors clustered at the origin–destination level.

[a]$p < .01$, [b]$p < .05$, [c]$p < .1$.

Data sources: Fortanier (2018), Borchert et al. (2021), Egger and Larch (2008) and Head et al. (2010).

of each product/service as weight and the upstreamness index of Antràs et al. (2012), U_p. Analytically:

$$U_{it} = \sum_p \left(\frac{exp_{ipt}}{\sum_p exp_{ipt}} * U_p \right) \tag{6}$$

Since U_p does not vary over time, the dynamics of U_{it} are entirely generated by the change in the composition of service exports during the period of analysis. It is important to highlight

FIGURE 10   Upstreameness over time. *Note*: (Panel a) plots the ranking in the average upstreameness index for different continents in 2002 and 2016 for services. (Panel b) does the same for goods. *Data sources*: Antràs et al. (2012), Fortanier (2018) and Borchert et al. (2021). [Colour figure can be viewed at wileyonlinelibrary.com]

that the interpretation of upstreamenss 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. Instead, for services being more upstream means providing high-skilled services for the production of final products such as engineering, management, architectural, 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 S3 in Appendix S1 shows the values of the upstreameness index from Antràs et al. (2012) for services and Table S5 in Appendix S1 the correspondence table for the different industry classifications.

The results are depicted in Figure 10 making a raking based on aggregating across different continents for the years 2002 and 2016.[14] 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 that tend to be more upstream. However, the trend is upwards highlighting that there is a tendency to increase upstreameness. Regarding the other continents, North America is the one for which exports of services are more upstream, thus specialising 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 upstreamess for each African country in Figures S7 (services) and S8 (goods) in Appendix S1, we can observe that for services the upstreameness 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 upstreameness, and Uganda, Zimbabwe, Kenya, and Burkina Faso which decreased their exports upstreameness. For goods (Figure S8 in Appendix S1) the situation is similar, with most countries remaining at the same level of export upstreameness 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

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[14]Figure S6 in Appendix S1 shows the evolution in all the years for all continents.

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.

4 | 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 liberalisation in goods had positive impact on trade in services due to their complementarity, and services showed to be more successful in reaching distant destinations than goods. Finally, African service exports tend to be concentrated on downstream low-skilled industries (and goods exports on low-skilled upstream industries) which account for a lower share of value added than high-skilled ones. These results point at the huge potential that African economies have for establishing a service-led growth and foster development.

DATA AVAILABILITY STATEMENT
The data used in this paper is publicly available.

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Additional supporting information can be found online in the Supporting Information section at the end of this article.

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