RSC 2022/75
Robert Schuman Centre for Advanced Studies
Global Governance Programme-486

WORKING PAPER

Services Trade Policy and Industry Performance in African Economies

Matteo Fiorini, Bernard Hoekman, Dennis Quinn

European University Institute
Robert Schuman Centre for Advanced Studies
Global Governance Programme-486

Services Trade Policy and Industry Performance in African Economies

Matteo Fiorini, Bernard Hoekman, Dennis Quinn

RSC Working Paper 2022/75

ISSN 1028-3625

Published in December 2022 by the European University Institute.
Badia Fiesolana, via dei Roccettini 9
I – 50014 San Domenico di Fiesole (FI)

Italy

With the support of the Erasmus+ Programme of the European Union

The European Commission supports the EUI through the European Union budget. This publication reflects the views only of the author(s), and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Robert Schuman Centre for Advanced Studies

The Robert Schuman Centre for Advanced Studies, created in 1992 and currently directed by Professor Erik Jones, aims to develop inter-disciplinary and comparative research on the major issues facing the process of European integration, European societies and Europe's place in 21st century global politics.

The Centre is home to a large post-doctoral programme and hosts major research programmes, projects and data sets, in addition to a range of working groups and ad hoc initiatives. The research agenda is organised around a set of core themes and is continuously evolving, reflecting the changing agenda of European integration, the expanding membership of the European Union, developments in Europe's neighbourhood and the wider world.

For more information: http://eui.eu/rscas

The Global Governance Programme

The Global Governance Programme is one of the flagship programmes of the Robert Schuman Centre. It is a community of outstanding professors and scholars that produces high quality research and engages with the world of practice through policy dialogue. Established and early-career scholars work on issues of global governance within and beyond academia, focusing on four broad and interdisciplinary areas: Global Economics, Europe in the World, Cultural Pluralism and Global Citizenship.

The Programme also aims to contribute to the fostering of present and future generations of policy and decision makers through its executive training programme: the Academy of Global Governance, where theory and 'real world' experience meet and where leading academics, top-level officials, heads of international organisations and senior executives discuss on topical issues relating to global governance.

For more information: http://globalgovernanceprogramme.eui

Abstract

This paper assesses the potential impacts of services trade liberalization for a sample of African countries. The focus is on the relationship between labour productivity of manufacturing sectors and two types of services trade-related policies – restrictions on foreign direct investment (FDI) in services and restrictions on international payments for invisibles. The analysis takes in account differences across manufacturing sectors in the intensity of use of different services as inputs into production as well as difference in the quality of economic governance across countries. We find that services trade liberalization may have substantial positive impacts on the performance of manufacturing sectors, and increase with services input intensity and the quality of governance.

Keywords

Services trade policy; services input use; manufacturing productivity; Africa; regional integration

Acknowledgments

We are grateful for financial support received from the African Economic Research Consortium and to two referees for constructive comments.

Table of Contents

1. Introduction 7
2. Services trade restrictiveness and manufacturing sector performance 8
3. Quantification 10
4. Restrictions on international payments for invisibles and sectoral performance 14
5. Conclusion 16
References 17
Appendix 18

1. Introduction

Services account for an increasing share of GDP and employment in Africa (Baccini et al., 2022) and can be a driver of sustainable development and economic growth (Newfarmer et al., 2018). However, trade in services is relatively limited and there is significant potential for trade in services to act as a driver of growth and development (Ariu and Ogliari, 2022). Harnessing that potential depends in part on measures to facilitate services trade. Services trade policies influence the extent to which African firms and households have access to services and the ability of companies to provide services in other countries.

Liberalization of trade in services is an element of the African Continental Free Trade Area (AfCFTA) (UNECA, 2021). The associated Protocol on Trade in Services follows that of the WTO General Agreement on Trade in Services (GATS), distinguishing between horizontal commitments (e.g., transparency provisions) and sector-specific commitments on market access and national treatment.[1] In parallel with the adoption of the AfCFTA, the Protocol to the Abuja Treaty relating to Free Movement of Persons, Right of Residence and Right of Establishment recognizes that the free movement of persons in Africa will facilitate the implementation of the AfCFTA, and support trade in services, especially via Mode 3 (supply of services through establishment of a commercial presence) and Mode 4 (supply through movement of natural persons) (Apiko et al. 2020).[2]

Restrictive services trade and investment policies may affect the degree of competition on services markets, and thus mark-ups and/or sectoral efficiency, with negative consequences for sectors that use services as inputs (e.g., Arnold et al. 2011). This paper investigates the potential impacts of liberalization of trade in services for a sample of African countries, focusing on the role of services as inputs into production of manufacturing. The analysis is motivated in part by the stylized fact that services value chains in the region are mostly composed of domestic value added, and only to a limited extent involve inputs sourced from regional or global suppliers (Shepherd, 2022).

Our focus is on policies affecting Mode 3 and Mode 1 trade in services, i.e., the ability of providers to sell services through foreign direct investment (FDI) and to provide services across borders using ICT technologies. Liberalization of these modes of supply is assumed to apply to all foreign suppliers. An implication is that our estimates will be too large if in practice AfCFTA liberalization of trade in services applies only to African firms. In practice liberalization of Mode 4 will be discriminatory in the sense of applying to member countries only. Whether AfCFTA-induced liberalization of Mode 1 and Mode 3 will be discriminatory is an empirical question that can only be answered in the future.

Section 1 briefly presents information on services trade restrictiveness indicators (STRIs) used in the analysis and summarizes the empirical approach used to relate productivity of manufacturing sectors to services trade policies. Section 2 quantifies the potential productivity effects of removal of Mode 3 services trade barriers. Section 3 exploits a measure of Mode 1 services trade policy for which there is a long time series to assess how such policies affect manufacturing sector labour productivity. Section 4 concludes.

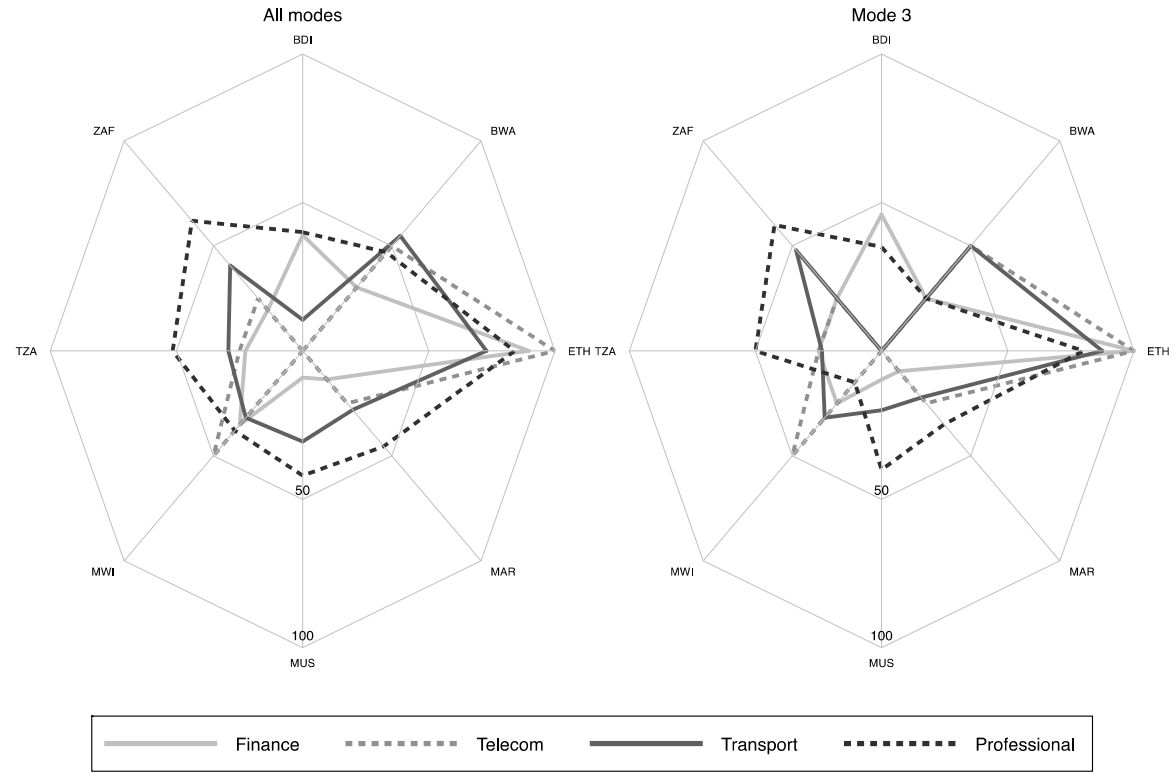
1 Five sectors are prioritized by AfCFTA signatories: financial services, transport, telecommunications and information technology, professional services, and tourism.

2 Trade in services is more complex than trade in goods as it encompasses four modes of supply, including through the internet/telecommunications networks (Mode 1), cross-border movement of providers, either legal entities (firms) (Mode 3) or natural persons (Mode 4), and cross border travel by consumers (tourists; business travel) (Mode 2).

2. Services trade restrictiveness and manufacturing sector performance

Detailed information on services trade policies is very limited for African countries. The most comprehensive country-sector STRIs for African economies are only available for one year in the late 2000s (Borchert et al. 2014).[3] Figure 1 plots average STRI values for all modes of provision and for Mode 3 for four services sectors prioritized in the AfCFTA – finance, transport, communications, and professional services – for Botswana, Burundi, Ethiopia, Malawi, Mauritius, Morocco, South Africa, and Tanzania.[4] The STRI indicators vary between 0 and 100, indicating respectively maximum openness and closure to services imports. For each country there is at least one sector where the restrictiveness value is around 50 both for all modes and Mode 3 STRI. Liberalization of barriers to trade in services will therefore impact differentially on countries and sectors.

Figure 1. STRIs by sector and country, selected African countries



Source: Authors' calculations based on Borchert et al. (2014). Data are for the late 2000s.

In what follows we use the approach and results reported in Beverelli et al. (2017) to quantify the potential effects on manufacturing industries' productivity performance of removal of all barriers to Mode 3 services trade in these producer services sectors in the eight African countries considered. Beverelli et al. (2017) estimate the following model:

$$y_{ij} = \alpha + \beta CSTRI_{ij} + \mu\left(CSTRI_{ij} \times EG_i\right) + \gamma x_{ij} + \delta_i + \delta_j + \epsilon_{ij} \quad (1)$$

where y_{ij} is the natural logarithm of productivity in downstream sector j in country i; $CSTRI_{ij}$ is a measure of the effective restrictiveness of services trade policy confronted by downstream sector j in country i; EG_i is a measure of the economic governance in country i given by the World Bank control of corruption indicator, x_{ij} is a control capturing the average level of tariff protection for non-services inputs used by downstream manufacturing sector j; and δ_i and δ_j are country- and sector-level fixed effects.

3 The WTO and World Bank will release a new dataset on services trade restrictiveness indicators for all African economies towards the end of 2022. This will substantially improve extant information on services trade policies for African countries.

4 The selection of countries is determined by availability of data needed for analysis of the relationship between services trade policies, governance, and sectoral productivity for up to 18 manufacturing sectors, as defined by the ISIC Rev. 3 two-digit classification.

The regressor of interest, $CSTRI_{ij}$, is constructed as $\sum_s STRI_{is} \times w_{ijs}$, where $STRI_{is}$ is the level of services trade restrictiveness for country i and service sector s, and w_{ijs} is a weighting coefficient that reflects the use of service s by manufacturing sector j in country i. To minimize the potential endogeneity of input-output weights w_j (policy restrictions might affect the use of services as inputs in manufacturing sectors), technical coefficients for the mid-1990s from the input- output (IO) table for the US (obtained from the OECD STAN database) are used.[5] The baseline measure of productivity (y_{ij}) is the output per worker in 2008, constructed using the United Nations Industrial Development Organization (UNIDO) industrial statistics database.

The estimated coefficients on $CSTRI_{ij}$ ($\hat{\beta}$) and the interaction term ($\hat{\mu}$) can be used to assess the impact of services trade policy restrictions on downstream industry performance, conditional on institutional quality, as follows:[6]

$$-\widehat{\frac{\partial y}{\partial CSTRI}} = -\hat{\beta} - \hat{\mu} \times EG_i$$

In the quantification exercise that follows we focus on a hypothetical removal of all restrictions to Mode 3 services trade. Because an unrestricted trade policy regime corresponds to an STRI value of zero, the policy change required by a country to remove all existing barriers to trade in services sector s in country i is given by 0 – $STRI_{is}$. The (negative) variation in the explanatory variable $CSTRI$ that reflects full liberalization of trade across services sectors is then given by:

$$\Delta CSTRI_{ij} = \sum_s (0 - STRI_{is}) \times w_{ijs}$$

The associated change in productivity (expressed in levels) implied by the estimated coefficients ($\hat{\beta}$ and $\hat{\mu}$) can be computed as follows:

$$\%\Delta Y_{ij} = 100 \times \left(\hat{\beta} + \hat{\mu} \times EG_i\right) \times \Delta CSTRI_{ij} \quad (2)$$

The productivity effect of services trade policy is a function of the services input intensities at the downstream sector level and two country level variables: the policy change required to reach complete openness and the quality of economic governance.

5 Use of US input-output in the mid-1990s to characterize the long run technological relationships between industries, including services input intensity follows the seminal contribution by Rajan and Zingales (1998) and is motivated by three features characterizing the American economy in the mid-1990s: (i) sector-specific policies that did not distort decisions to use services as intermediate inputs; (ii) a business-friendly economic environment in which cross-sectoral regulation similarly did not affect services sourcing decisions; and (iii) a diversified economy in which the universe of manufacturing sectors is well represented. Beverelli et al. (2017) report that using China's I-O coefficients instead does not qualitatively affect the results.

6 The negative sign in front of the marginal effect reflects the fact that reducing barriers to services trade (decreasing the value of $STRI$) lowers the value of $CSTRI$.

3. Quantification

We quantify the potential impacts of services trade liberalization for our sample of African countries as follows. First, equation (1) is fitted with the estimation sample used by Beverelli et al. (2017), augmented with data for the US to increase estimation precision (this increases the estimation sample size from 912 in the original paper to 930). Second, the resulting estimates of $\hat{\beta}$ = 0.055 (robust standard error 0.030) and $\hat{\mu}$ =-0.037 (robust standard error 0.011),[7] together with the country-specific values of institutional quality, EG_i, and the country-sector specific values of the policy change needed to remove all restrictions to Mode 3 services trade, $\Delta CSTRI_{ij}$, are used to compute values of $\%\Delta Y_{ij}$ (equation 2). The variability of $\%\Delta Y_{ij}$ across manufacturing sectors (j) is completely accounted for by the technological dependence of each sector on the set of producer services, which are the target of the hypothesized reform. Country-level variability in $\%\Delta Y_{ij}$ has two dimensions: the services trade policy stance for the four services sectors and the heterogeneity of institutions across the sample of countries.

Table 1 presents the results. For each country, the effect of services trade liberalization is presented for the manufacturing sectors generating the highest and second-highest average value added during 2000–2007. Columns (1) and (4) list the corresponding sectors. Columns (2) and (5) list the values of $\%\Delta Y_{ij}$. When the quality of the governance institutions is low enough, and the country-specific marginal effect used to compute $\%\Delta Y_{ij}$ is not statistically different from 0, $\%\Delta Y_{ij}$ is set equal to 0. In these cases, the impact based on the estimated value of the marginal effect is reported in brackets. Columns (3) and (6) report – respectively for the largest and second-largest manufacturing sector – the effect of the same hypothesized policy reform but for the counterfactual situation in which each country's governance indicator is replaced with that of the best-performing country in the sample (Botswana, South Africa, and Mauritius for control of corruption, regulatory quality, and rule of law, respectively).

This exercise reveals the difference better institutions can potentially make in augmenting the productivity effects of services liberalization in economies with weak governance performance. The last two columns of Table 1 report each country's relative rank with respect to the level of prevailing openness to Mode 3 services trade in services (the average value of $STRI$ across the four producer services sectors) and the quality of domestic economic governance. Results are presented in three panels, each of which uses a different governance indicator as the moderating factor in the empirical analysis. Panel A reports results using control of corruption, panel B used regulatory quality, and panel C uses the rule of law indicator.

The distribution of potential downstream productivity effects is skewed toward zero; it is positive and statistically significant only for Botswana, Mauritius and South Africa. The potential productivity impacts are relatively heterogeneous, reflecting differences in the intensity of service input use across industries. Countries that potentially stand to benefit the most in terms of productivity increases have the best economic governance. The lower the quality of governance, the lower the productivity effect of services trade liberalization.

7 These results are obtained using control of corruption as a proxy for economic governance. The full set of regression results for alternative measures of governance are reported in Appendix Table A1, col. (1). The estimates are very robust to the removal of the US from the sample. In that case $\hat{\beta}$ is equal to 0.054 (with robust standard error 0.031) and $\hat{\mu}$ remains equal to -0.037 (with robust standard error 0.012).

Table 1. Potential Increase in Labour Productivity ($\%\Delta Y_{ij}$)

	Biggest Manufacturing Sector			Second-biggest Manufacturing Sector			Country Ranking	
	Sector	Impact, current inst.	Impact, counterfac-tual high inst.	Sector	Impact, current inst.	Impact, counterfactual high inst.	Openness	Institutions
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Control of corruption (Highest in sample: Botswana)								
Botswana	furniture	34.32***	34.32	food/bev	38.21***	38.21	6	1
Burundi	food/bev	0 (-1.59)	27.80	metals	0 (-.57)	10	2	8
Ethiopia	food/bev	0 (20.08)	98.05	minerals	0 (32.94)	160.83	8	7
Malawi	food/bev	0 (6.38)	26.63	chemicals	0 (6.13)	25.60	4	6
Mauritius	textiles/app	14.24**	18.48	food/bev	23.48**	30.47	1	2
Morocco	food/bev	0 (10.51)	29.99	textiles	0 (6.7)	19.13	3	4
South Africa	food/bev	34.72**	55.19	coke/oil	10.64**	16.91	7	3
Tanzania	food/bev	0 (14.14)	41.56	minerals	0 (17.97)	52.83	5	5
Panel B: Regulatory quality (High in sample: South Africa)								
Botswana	furniture	24.88***	26.72	food/bev	27.69***	29.75	6	3
Burundi	food/bev	0 (-7.64)	21.64	metals	0 (-2.75)	7.79	2	8
Ethiopia	food/bev	0 (-7.6)	76.33	minerals	0 (-12.46)	125.22	8	7
Malawi	food/bev	0 (4.82)	20.73	chemicals	0 (4.63)	19.93	4	6
Mauritius	textiles/app	14.16***	14.39	food/bev	23.35***	23.72	1	2
Morocco	food/bev	0 (10.4)	23.35	textiles	0 (6.63)	14.89	3	4
South Africa	food/bev	42.97***	42.97	coke/oil	13.17***	13.17	7	1
Tanzania	food/bev	0 (9.37)	32.35	minerals	0 (11.91)	41.13	5	5
Panel C: Rule of law (Highest in sample: Mauritius)								
Botswana	furniture.	28.18***	34.04	food/bev	31.37***	37.89	6	2
Burundi	food/bev	0 (-6.18)	27.57	metals	0 (-2.22)	9.92	2	8
Ethiopia	food/bev	0 (7.68)	97.24	minerals	0 (12.6)	159.51	8	7
Malawi	food/bev	0 (8.82)	26.41	chemicals	0 (8.48)	25.39	4	4
Mauritius	textiles/app	18.33***	18.33	food/bev	30.22***	30.22	1	1
Morocco	food/bev	0 (8.55)	29.75	textiles	0 (5.45)	18.97	3	5
South Africa	food/bev	27.08*	54.74	coke/oil	8.30*	16.77	7	3
Tanzania	food/bev	0 (9.44)	41.21	minerals	0 (12)	52.39	5	6

Notes: 'Impact' refers to the percentage change in sectoral labour productivity of removing all barriers to Mode 3 services trade in financial, transport, communication, and professional services. Columns (2) and (5) report the estimated impact, given the prevailing quality of governance in the corresponding country (rule of law, regulatory quality, and control of corruption in panels A, B, and C, respectively). When not statistically significant, the point estimate is reported in parentheses next to an impact value of 0. Columns (3) and (6) report impact values assuming the highest measure of the respective governance variable. Sectors based on ISIC 2-digit Rev.3. (Food/Bev: 15+16; Textiles & Apparel: 17+18+19; Furniture: 36+37; Metals: 27; Mineral Products: 26; Chemicals: 24; Coke/Oil: 23). * p<0.1; ** p<0.05; *** p<0.01.

Sources: World Bank Governance Indicators and Services Trade Restrictiveness databases. Output per worker from UNIDO industrial statistics database.

The Effect of Trade Policy Targeting Specific Services Sectors

The above analysis assumes that conditional on input intensity, the effects of services trade policy do not vary across services sectors. We now relax this assumption by defining four services-sector-specific composite services trade policy variables: $CSTRI_{ijs} = STRI_{is} \times w_{ijs}$ for each S equal to finance, communications, transport, and professional services, and replicate the quantification exercise for each of these instruments.[8]

The regression estimates required for the quantification ($\hat{\beta}_s$ and $\hat{\mu}_s$ for all s) are reported in columns (2)–(5) of Appendix Table A1. Results suggest the qualitative pattern of results is stable across all individual sectors. The only exception is professional services when governance is proxied with regulatory quality or rule of law (panels B and C of Table A1). However, in these cases, no significant pattern is identified. An implication is that liberalizing one sector in isolation tends to benefit downstream economic activity as long as governance institutions are not too weak.

Table 2 reports the estimates for $\%\Delta Y_{iis}$. The estimated effects are computed based on the results in Panel A of Appendix Table A1, where economic governance is measured by the degree of control of corruption in the economy. Each observation is identified by the country implementing the reform, the specific services sector for which trade barriers are removed, and the manufacturing sector whose productivity is potentially affected by the reform. The statistical significance of the estimates depends on the country and services sector, and is in the standard threshold of 10% for the few country-services sector pairs, reflecting lower statistical significance of the services-sector-specific regression estimates.[9] The quantification reported in the table consists of 576 estimates, 54 of which are labelled as 'NA' (not applicable). These cells identify the services sectors already fully opened to trade in the respective country. Four tones of grey – from the lightest to the darkest – denote observations in the 25th percentile (equal to 2.62), between the 25th and the 50th (5.94), the 50th and the 75th (11.89), and above the 75th percentile of the distribution of $\%\Delta Y_{ijs}$ in the sample of estimates, excluding NA cells.

Table 2 gives an indication of the heterogeneous effects on manufacturing sectors (columns) of services trade liberalization across countries and specific services sectors (rows). The low statistical significance of point estimates reveals that for many countries, the quality of governance institutions is too low. Effects would linearly increase and become statistically different from zero with higher institutional quality. Results suggest the proportionality coefficient in these linear relationships is particularly high for the effects of trade liberalization in financial and telecommunications services.

8 Full liberalization of trade in sector S is given by $\Delta CSTRI_{ijs} = -STRI_{is} \times w_{ijs}$ and the change in productivity by $\%\Delta Y_{ijs} = 100 \times (\hat{\beta}_s + \hat{\mu}_s \times EG_i) \times \Delta CSTRI_{ijs}$.

9 The country-services sector pairs for which estimates satisfy the 10% threshold of statistical significance are: BWA-finance; BWA-telecom; MAR-finance; MAR-telecom; MUS-finance; MUS-telecom; TZA-finance; TZA-telecom; ZAF-finance; ZAF-telecom.

Table 2. Potential Increase in Labour Productivity ($\%\Delta Y_{ijs}$)

	Removal of services sectoral trade barriers	Food products, beverages and tobacco (15-16)	Textiles, textile products, leather and footwear (17-19)	Wood and products of wood and cork (20)	Pulp, paper, paper products, printing and publishing (21-22)	Coke, refined petroleum products and nuclear fuel (23)	Chemicals and chemical products (24)	Rubber and plastics products (25)	Other non-metallic mineral products (26)	Basic metals (27)	Fabricated metal products except machinery and equipment (28)	Machinery and equipment n.e.c (29)	Office, accounting and computing machinery (30)	Electrical machinery and apparatus n.e.c (31)	Radio, television and communication equipment (32)	Medical, precision and optical instruments (33)	Motor vehicles, trailers and semi-trailers (34)	Other transport equipment (35)	Manufacturing n.e.c; recycling (36-37)
BDI	Finance	2,93	1,90	1,63	4,11	1,62	2,58	2,38	3,31	1,77	3,09	3,07	4,16	3,11	4,16	4,16	2,37	2,72	3,27
	Telecom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Transport	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Prof. Ser.	6,55	2,95	1,24	4,05	1,17	5,83	3,25	4,19	1,64	4,08	5,05	6,11	3,96	6,11	6,11	1,71	4,01	4,86
BWA	Finance	29,28	19,04	16,32	41,14	16,25	25,77	23,83	33,14	17,69	30,94	30,72	41,62	31,13	41,62	41,62	23,75	27,23	32,69
	Telecom	15,41	10,63	9,59	50,43	3,94	15,34	13,69	16,49	6,96	19,69	30,94	33,06	14,82	33,06	33,06	14,09	17,22	27,56
	Transport	12,47	13,81	15,79	15,17	6,24	12,99	11,89	44,64	32,12	7,63	6,92	5,49	8,17	5,49	5,49	7,22	7,20	10,01
	Prof. Ser.	6,45	2,90	1,22	3,99	1,15	5,74	3,20	4,13	1,61	4,01	4,97	6,02	3,90	6,02	6,02	1,69	3,95	4,79
ETH	Finance	33,82	21,99	18,84	47,51	18,77	29,77	27,52	38,27	20,43	35,73	35,48	48,06	35,96	48,06	48,06	27,43	31,45	37,76
	Telecom	13,22	9,13	8,23	43,29	3,38	13,17	11,75	14,16	5,97	16,90	26,56	28,37	12,72	28,37	28,37	12,09	14,78	23,65
	Transport	-1,67	-1,85	-2,11	-2,03	-0,83	-1,74	-1,59	-5,97	-4,30	-1,02	-0,93	-0,73	-1,09	-0,73	-0,73	-0,97	-0,96	-1,34
	Prof. Ser.	16,38	7,37	3,09	10,14	2,93	14,57	8,12	10,48	4,10	10,19	12,63	15,29	9,89	15,29	15,29	4,28	10,03	12,15
MAR	Finance	4,75	3,09	2,65	6,68	2,64	4,18	3,87	5,38	2,87	5,02	4,99	6,76	5,05	6,76	6,76	3,86	4,42	5,31
	Telecom	4,11	2,84	2,56	13,46	1,05	4,09	3,65	4,40	1,86	5,25	8,25	8,82	3,95	8,82	8,82	3,76	4,60	7,35
	Transport	0,67	0,74	0,85	0,81	0,33	0,70	0,64	2,39	1,72	0,41	0,37	0,29	0,44	0,29	0,29	0,39	0,39	0,54
	Prof. Ser.	7,51	3,38	1,42	4,65	1,34	6,68	3,72	4,80	1,88	4,67	5,79	7,01	4,53	7,01	7,01	1,96	4,60	5,57
MUS	Finance	9,02	5,86	5,03	12,67	5,01	7,94	7,34	10,21	5,45	9,53	9,46	12,82	9,59	12,82	12,82	7,32	8,39	10,07
	Telecom	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Transport	3,44	3,81	4,35	4,18	1,72	3,58	3,28	12,31	8,86	2,10	1,91	1,51	2,25	1,51	1,51	1,99	1,98	2,76
	Prof. Ser.	9,70	4,37	1,83	6,01	1,74	8,63	4,81	6,21	2,43	6,04	7,49	9,06	5,86	9,06	9,06	2,54	5,94	7,20
MWI	Finance	9,37	6,09	5,22	13,16	5,20	8,24	7,62	10,60	5,66	9,90	9,83	13,31	9,96	13,31	13,31	7,60	8,71	10,46
	Telecom	7,00	4,83	4,36	22,91	1,79	6,97	6,22	7,49	3,16	8,94	14,05	15,01	6,73	15,01	15,01	6,40	7,82	12,52
	Transport	-0,23	-0,26	-0,29	-0,28	-0,12	-0,24	-0,22	-0,83	-0,60	-0,14	-0,13	-0,10	-0,15	-0,10	-0,10	-0,13	-0,13	-0,19
	Prof. Ser.	3,11	1,40	0,59	1,92	0,56	2,76	1,54	1,99	0,78	1,93	2,40	2,90	1,88	2,90	2,90	0,81	1,90	2,30
TZA	Finance	12,00	7,80	6,69	16,86	6,66	10,56	9,77	13,58	7,25	12,68	12,59	17,06	12,76	17,06	17,06	9,73	11,16	13,40
	Telecom	4,05	2,80	2,52	13,27	1,04	4,04	3,60	4,34	1,83	5,18	8,14	8,70	3,90	8,70	8,70	3,71	4,53	7,25
	Transport	0,63	0,70	0,80	0,77	0,31	0,66	0,60	2,25	1,62	0,38	0,35	0,28	0,41	0,28	0,28	0,36	0,36	0,51
	Prof. Ser.	10,69	4,81	2,02	6,62	1,91	9,51	5,30	6,84	2,68	6,65	8,24	9,98	6,46	9,98	9,98	2,80	6,55	7,93
ZAF	Finance	19,57	12,72	10,90	27,49	10,86	17,22	15,93	22,14	11,82	20,68	20,53	27,81	20,80	27,81	27,81	15,87	18,20	21,85
	Telecom	5,65	3,90	3,52	18,50	1,45	5,63	5,02	6,05	2,55	7,22	11,35	12,13	5,44	12,13	12,13	5,17	6,32	10,11
	Transport	5,95	6,59	7,53	7,24	2,98	6,20	5,67	21,30	15,33	3,64	3,30	2,62	3,90	2,62	2,62	3,45	3,43	4,78
	Prof. Ser.	13,99	6,30	2,64	8,66	2,50	12,44	6,93	8,95	3,50	8,70	10,79	13,06	8,45	13,06	13,06	3,66	8,57	10,38

Notes: The table reports the percentage change in labour productivity in the manufacturing sector specified in the first row associated with the removal of all barriers to Mode 3 trade in the services sector specified in the second column (Finance, Telecom, Transport, and Professional services). Estimates computed using results in Panel A of Table A1, with governance measured by control of corruption. The estimates in each cell are identified by the country implementing the reform, the services sector that is liberalized and the potentially impacted manufacturing sector. The statistical significance of the estimates meets the 10% threshold for the following country-services pairs: BWA-finance; BWA-telecom; MAR-finance; MAR-telecom; MUS-finance; MUS-telecom; TZA-finance; TZA-telecom; ZAF-finance; ZAF-telecom. The four shades of grey – from lightest to darkest – identify observations in the 25th percentile of the distribution, respectively. Manufacturing sectors reflect ISIC 2-digit Rev. 3. ISIC codes in parentheses following sectoral labels in the first row.

Sources: World Bank Governance Indicators; World Bank Services Trade Restrictiveness Database; Labour productivity (output per worker) from the UNIDO industrial statistics database.

4. Restrictions on international payments for invisibles and sectoral performance

The usefulness of extant STRI data is limited given that for many developing countries STRIs are only available for one year in the late 2000s.[10] In this section we use a proxy measure of services trade policy that is available for a long period of time, the ability of residents of country to make payments to nonresidents for purchases of foreign 'invisibles' in year t. We denote this variable as $PAYinv_{it}$. It is constructed from data reported in the IMF annual report on exchange arrangements and restrictions, using a coding scheme developed by Quinn (1997) corporate taxation, government expenditures, and income inequality are estimated, using the models, methods, and data of Barro (1991.[11] Higher values of $PAYinv_{it}$ reflect a more restrictive policy regime. This measure of services trade policy complements the forgoing analysis of mode 3 trade restrictions in two ways. First, this policy measure is available on an annual basis. Second, $PAYinv_{it}$ affects Mode 1 trade in services.

To assess how $PAYinv_{it}$ impacts on economic performance, we again define a variable capturing the intensity of use by manufacturing sector j of services that can be imported as intermediate inputs (w_j), define a composite restrictiveness index for country i and manufacturing sector j at time t as $CRI_{ijt} = PAYinv_{it} \times w_j$ and estimate labour productivity (in logs) as:

$$y_{ijt} = \beta CRI_{ijt} + \gamma x_{ijt} + \delta_{it} + \delta_{jt} + \varepsilon_{ijt} \quad (3)$$

where x_{ijt} is the capital-labour ratio, a determinant of productivity that is potentially correlated with CRI_{ijt}; δ_{it} and δ_{jt} are country-time and sector-time fixed effects, respectively; and ε_{ijt} is the error term. The marginal effect of CRI on labour productivity is given by the estimated coefficient, $\hat{\beta}$.

In the empirical implementation we limit attention to financial and business services that have a higher quality to price ratio than domestic services, which in turn may enhance productivity. Data to construct the log of capital-labour ratio and labour productivity, measured as the natural logarithm of the ratio between value added and total employed persons, come from the UNIDO IndSTAT database. As before, to minimize the potential endogeneity of input-output weights we use technical coefficients for the mid-1990s for the United States.

We expect $\hat{\beta}$ to be negative and statistically significant. Reducing restrictions on payments for services imports (i.e., a lower value of $PAYinv$, reflected in a proportional decrease in CRI) is expected to increase the labour productivity of downstream manufacturing sectors. In this exercise endogeneity resulting from observable and/or unobservable heterogeneity is less of a concern than in the previous STRI-based analysis. Country-time and sector-time fixed effects control for any country- or sector-specific time contingent shock that has the property of affecting both labour productivity and the regressor of interest.

Merging the various databases listed above using only data for African countries for which we have time series data for $PAYinv$, we obtain an unbalanced panel covering 12 countries, up to 18 manufacturing sectors (2-digit ISIC Rev3) and 18 years (1995-2012). We restrict the sample to the post 1995 period to ensure coefficients derived from the US IO table for the mid-1990s are observed at the beginning of the sample and therefore are not endogenous to the policy dimension of CRI. The estimation sample is further limited by including only country-sector pairs for which at least 5 observations are available during the 1995-2012 period. This gives an estimation sample of 1,593 observations. Summary statistics for this sample are reported in Table 3.

10 The OECD compiles STRI data on an annual basis for OECD member countries and a selection of non-OECD nations, but this does not extend to Africa. See Hoekman and Shepherd (2021). Recent projects to compile information on digital trade policies have more comprehensive coverage of African countries. See Ferracane (2022) and OECD et al. (2022). As noted previously, the WTO and World Bank will release updated information for all African economies towards the end of 2022. This will span additional sectors and policy measures, and substantially improve extant STRI information for African countries.

11 Data on this and other proxies for services trade policy is sourced from the IMF Annual Report on Exchange *Arrangements* and Exchange *Restrictions*. This report has been published continually since 1950. The association between manufacturing sector performance and variables characterizing policies towards payments for invisibles (Mode 1) and capital flows (Mode 3) is assessed more generally in Fiorini, Hoekman and Quinn (2022).

Given the large number of missing values in the capital series reported in the UNIDO database, when we construct an estimation sample that includes data on the log of the capital labour ratio the number of countries falls to seven: Cameroon, Egypt, Ethiopia, Morocco, Madagascar, Tunisia, and Tanzania. Summary statistics for this smaller sample of countries are reported in Table 4.

Table 3. Summary Statistics: 12 African countries (N=1,593)

Variable	mean	p50	s.d.	min	max
Log VA/L	9.373	9.512	1.303	2.942	13.761
CRI	1.157	1.198	0.981	0	4.632
$PAYinv$	30.697	50	23.075	0	75

Table 4. Summary Statistics: 7 African countries, including K/L ratio (N=804)

Variable	mean	p50	s.d.	min	max
Log VA/L	9.011	9.190	1.453	2.949	13.327
CRI	1.317	1.375	0.928	0	4.632
$PAYinv$	35.168	50	20.989	0	75
log K/L	7.562	7.686	1.429	0.592	11.658

Estimation results using data for the seven African countries for which data on capital stocks are available are reported in the last column of Table 5. The results illustrate that policies affecting payments for invisibles may have significant effects on sectoral productivity performance. The negative and statistical relationship between the composite indicator of payment restrictiveness and downstream levels of labour productivity is confirmed, with the magnitude of the coefficient estimate increasing relative to the sample of twelve African countries. More precisely, the CRI coefficient in column 3 implies that a reduction in restrictiveness amounting to a decrease in CRI by 1 standard deviation (-0.928) is associated with a 23.6% higher level of labour productivity (note this is not in log terms).

Table 5. Regression results

Dependent variable:	Log of Labour Productivity (value added per worker)		
	(1)	(2)	(3)
CRI	-0.0824*	-0.199***	-0.254***
	(0.0432)	(0.0602)	(0.0752)
log K/L			0.198***
			(0.0566)
Observations	1593	1593	804
Adjusted R-squared	0.647	0.626	0.684
Country FE	Yes		
Sector FE	Yes		
Year FE	Yes		
Country-Year FE		Yes	Yes
Sector-Year FE		Yes	Yes
Number of countries	12	12	7

Notes: Robust standard errors clustered at the country-time level reported in parentheses. Statistical significance: * p<0.1; ** p<0.05; *** p<0.01.

5. Conclusion

This paper investigates the relationship between services trade policies and manufacturing sector productivity performance for a sample of African countries. Estimates from both cross-section STRIs for Mode 3 and time series data for a measure of Mode 1 services trade policy point to a positive and economically significant effect of lower services trade restrictions. The potential impacts of Mode 3 liberalization is influenced by the quality of prevailing institutions.

The findings suggest the potential benefits of services liberalization by African countries for downstream sectors may be substantial, but any such conclusion can only be tentative given data constraints and the partial equilibrium nature of our analysis. Limiting the focus to downstream sector-specific productivity effects, and not the overall economy-wide effects of removing services trade restrictions, neglects the potential effects of services trade reforms on services output, employment and trade. The net impact of services trade reforms will depend on how they affect different services sectors as well as downstream services-using sectors and associated general equilibrium linkages.

Another caveat regarding the salience of the findings from the perspective of the AfCFTA is that the World Bank STRIs are assumed to reflect policies that apply to all foreign suppliers equally. In our use of the both the Mode 3 STRIs and the measure of Mode 1 services trade policy, we do not allow for the possibility that policy may be applied in a discriminatory manner. Insofar as implementation of services trade liberalization under the AfCFTA is limited to African firms, the estimates obtained should be regarded as an upper bound. The extent to which services liberalization will be discriminatory is an empirical question that will be clarified as AfCFTA is implemented over time.

References

Apiko, P. S. Woolfrey and B. Byiers. 2020. The promise of the African Continental Free Trade Area. https://ecdpm.org/publications/promise-african-continental-free-trade-area-afcfta/.

Ariu, A. and L. Ogliari. 2022. Services Trade in Africa: Structure and Growth. AERC Working Paper GVC-08. http://publication.aercafricalibrary.org/handle/123456789/3415.

Arnold, J., B. Javorcik, and A. Mattoo. 2011. Does Services Liberalization Benefit Manufacturing Firms? Evidence from the Czech Republic, *Journal of International Economics* 85(1): 136–46.

Baccini, L., M. Fiorini, B. Hoekman and M. Sanfilippo. 2022. Services, Jobs and Economic Development in Africa, *World Bank Research Observer.* https://doi.org/10.1093/wbro/lkac006.

Beverelli, C., M. Fiorini and B. Hoekman. 2017. Services Trade Policy and Manufacturing Productivity: The Role of Institutions, *Journal of International Economics* 104: 166–182.

Borchert, I., B. Gootiiz and A. Mattoo. 2014. Policy Barriers to International Trade in Services: Evidence from a New Database. *World Bank Economic Review* 28 (1): 162–88.

Ferracane, M. (Ed.). 2022. Digital Trade Integration Database. European University Institute et al. https://www.dti.eui.eu.

Fiorini, M., B. Hoekman and D. Quinn. 2022. International financial openness and manufacturing productivity: A services trade perspective, EUI working paper, in process.

Hoekman, B. and B. Shepherd. 2021. Services Trade Policies and Economic Integration: New Evidence for Developing Countries, *World Trade Review*. 20(1): 115–134.

Newfarmer, R., J. Page and F. Tarp (eds.). 2018. *Industries without Smokestacks: African Industrialization Revisited*. Oxford University Press.

OECD, UNECA, ESCAP, ECLAC. 2022. Shedding New Light on the Evolving Regulatory Framework for Digital Services Trade. https://bit.ly/3NNIOKa

Quinn, D. 1997. The Correlates of Change in International Financial Regulation, *The American Political Science Review*, 91(3), 531–551.

Rajan, R. and L. Zingales. 1998. Financial Dependence and Growth. *American Economic Review*, 88(3): 559–586.

Shepherd, B. 2022. Regional Integration and Services in African Value Chains: Retrospect and Prospect. AERC Working Paper GVC-001. http://publication.aercafricalibrary.org/handle/123456789/3408.

UNECA. 2021. Governing the African Continental Free Trade Area: Regional Economic Communities Interface. https://repository.uneca.org/handle/10855/46717.

Appendix

Table A1. Regression Estimates (2008)

$CSTRI$ type	Aggregate	Finance	Telecom	Transport	Professional
	(1)	(2)	(3)	(4)	(5)
Panel A: EG as control of corruption					
$CSTRI$	0.055*	0.259	0.097	0.074*	-0.018
	(0.030)	(0.303)	(0.227)	(0.042)	(0.047)
$CSTRI$ x EG	-0.037***	-0.204*	-0.132*	-0.037**	-0.004
	(0.011)	(0.121)	(0.078)	(0.016)	(0.019)
Adjusted R-squared	0.591	0.589	0.589	0.589	0.586
Panel B: EG as regulatory quality					
$CSTRI$	0.073**	0.211	-0.026	0.116**	-0.051
	(0.032)	(0.264)	(0.230)	(0.044)	(0.060)
$CSTRI$ x EG	-0.042***	-0.193*	-0.093	-0.053***	0.009
	(0.011)	(0.115)	(0.088)	(0.016)	(0.025)
Adjusted R-squared	0.591	0.589	0.589	0.590	0.586
Panel C: EG as rule of law					
$CSTRI$	0.077**	0.086	0.013	0.121***	-0.036
	(0.032)	(0.328)	(0.255)	(0.042)	(0.050)
$CSTRI$ x EG	-0.044***	-0.132	-0.102	-0.054***	0.003
	(0.012)	(0.128)	(0.091)	(0.016)	(0.021)
Adjusted R-squared	0.592	0.588	0.589	0.591	0.586
Observations	930	930	930	930	930

Notes: All regressions include country and sector fixed effects as well as the input tariff regressor x. Robust (country-clustered) standard errors in parenthesis. Statistical significance: * p<0.1; ** p<0.05; *** p<0.01.

Sources: Governance variables are from the World Bank Governance Indicators. Services trade policies from the World Bank Services Trade Restrictiveness Database. Labour productivity (output per worker) from the UNIDO industrial statistics database.

Authors

Matteo Fiorini

OECD and European University Institute

Matteo.Fiorini@eui.eu

Bernard Hoekman

European University Institute and CEPR

Bernard.Hoekman@eui.eu

Dennis Quinn

Georgetown University

dennis.quinn@georgetown.edu