Services Trade Policies and Services Trade Costs: New Evidence for African Economies[1,2]

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Abstract:

Services trade is instrumental for economic development, structural transformation and trade diversification in developing countries. Yet there is a paucity of information on applied services trade policies especially in less developed economies. The Services Trade Policy Database (STPD), jointly developed by the World Bank and the World Trade Organization, addresses this knowledge gap. Its global coverage has been significantly expanded through a major ongoing update that focuses on the African Union, partly supported by the German Development Agency GIZ, the European Commission and the International Trade Centre (ITC) as part of their support to the African Continental Free Trade Area (AfCFTA) negotiations. In this paper, we present evidence on policy restrictiveness in services sectors for 27 African economies for 2020/2021. As such, we expect these data to be useful for a range of analyses that tackle the economics of regional integration and cooperation in services sectors.

The paper makes three principal contributions: firstly, it describes the regulatory data, which represent a global public good for researchers and many other stakeholders. The data cover 23 services subsectors across five essential/infrastructure sectors (Financial, Telecom, Distribution, Transportation, and Professional Services). Secondly, we quantify the policy information using the latest WB-WTO Services Trade Restrictions Indices (STRI) methodology, which is based on a conceptually new approach that facilitates quantitative

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[2] **Disclaimer**: This is a working paper and represents research in progress. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They are not intended to represent the positions or opinions of the WTO or its Members and are without prejudice to Members' rights and obligations under the WTO. They also do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, the Executive Directors of the World Bank, the governments they represent, or any of the aforementioned individuals. Any errors are attributable to the authors.

analyses of services trade costs. Thirdly, we combine the new policy index with actual trade flow information and structural gravity theory to estimate ad valorem equivalent (AVEs) trade cost changes for African economies. In doing so, we capitalize on the modular and transparent structure of the WB-WTO STRI to illustrate how the new index lends itself to simulating the trade cost implications of policy changes.

JEL Codes: F13, F14, F23, L80

Keywords: Services trade costs, Policy restrictiveness, STRI, quantification.

INTRODUCTION

Much attention has been paid lately to the reduction of trade costs as a means to reviving trade growth and support economic recovery after the Covid 19-induced global recession. Indeed, despite the steady fall over the last two decades, the costs of international trade in goods remain very high, roughly equivalent to a 100% import tariff (World Bank, 2021). The main culprits for those high trade costs are non-tariff aspects, such as cumbersome trade procedures and processes, as well as inadequacies in shipping and logistics.

Much of the research on trade costs has focused, thanks to availability of relevant data, on trade in goods. However, over at least the last three decades, services have become a major component not only of world trade but also of economies' path towards economic and trade diversification. On the one hand, world trade in services has been growing faster than trade in goods, at least since 2005 (WTO, 2019). In that context, developing countries' share of world services trade has grown by more than 10 percentage points since 2005, reaching 25 % of world services exports and 34.4 % of world services imports in 2017 (WTO, 2019). At the same time, beyond being traded on their own, tradable services such as communications, finance, business, logistics and transport, enter the production processes of everything else and also provide the necessary links within GVCs, becoming therefore enablers of trade in goods.

Despite the growing and undeniable significance of services for trade, comparable cross-country information on services trade costs and on policies affecting trade in services are very limited, in particular as regards less advanced economies (Anderson et al., 2018). A major step forward in that regard has been made by the World Bank and the WTO, who (with the support of other organizations and institutions, notably GIZ, the European Commission, and the ITC) have jointly collected regulatory information policies affecting trade in services in all African countries. On the basis of such data, we present evidence on policy restrictiveness in services sectors for 27 African economies for 2020/2021. The economies covered are the following: Algeria, Angola, Burkina Faso, Cameroon, Côte d'Ivoire, Democratic Republic of Congo, Eswatini, Ethiopia, Gabon, Ghana, Guinea, Kenya, Mali, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, Zambia and Zimbabwe.

The paper makes three principal contributions: firstly, it describes the regulatory data, which represent a global public good for researchers and many other stakeholders. The data cover 23 services subsectors across five essential/infrastructure sectors (Financial, Telecom, Distribution, Transportation, and Professional Services). Secondly, we quantify the policy information using the latest WB-WTO Services Trade Restrictions Indices (STRI) methodology, which is based on a conceptually new approach that facilitates quantitative analyses of services trade costs. Thirdly, we combine the new policy index with actual trade flow information and structural gravity theory to estimate ad valorem equivalent (AVEs) trade cost changes for African economies. In doing so, we capitalize on the modular and transparent structure of the WB-WTO STRI to illustrate how the new index lends itself to simulating the trade cost implications of policy changes.

The paper is organized as follows. Section 1 describes the Services Trade Policy Database and the data collection process, while Section 2 describes the current World Bank-WTO Services Trade Restrictions Index (STRI), which was introduced in 2019 (Borchert et al., 2019) and which updates and improves on the index developed by the World Bank in 2012. Using the resultant indices, Section 3 presents current patterns of services trade policy as well as the evolution of such policy over the past decade. Section 4 sets out how our estimated ad valorem equivalents (AVE) arise from a structural gravity framework adapted to cater for regulatory barriers to services trade, and presents visual representations of the estimated ad valorem equivalent (AVEs) trade cost changes for two alternative counterfactual policy reform scenarios. The final section summarizes the findings of the paper and identifies areas for future work.

1 THE WB-WTO SERVICES TRADE POLICY DATABASE

The Services Trade Policy Database (STPD) builds on a number of prior initiatives by the WTO, the World Bank and the OECD.[3]

The STPD contains information on policies and regulations that affect international trade in services on a cross-border basis, through a commercial presence, and through the presence of a natural person.[4] We consider policies and regulations applied by the importing/'host' economy (i.e. the economy where the services consumer is located), which affect the ability of foreign suppliers to supply services to consumers in that economy. Certain domestic regulations that apply to both domestic and foreign agents are also covered insofar as they affect trade. The database, and thus the related Services Trade Restrictions Index (STRI), focuses on economies' Most-Favoured Nation (MFN) policies.[5]

The database already contains information on services policy and regulation in 76 economies – 39 high-income, 23 upper-middle and 14 lower-middle income economies (see STPD_economies_sectors_covered.pdf (wto.org)) and has been expanded in 2020-2021 to include information on all African economies, as well as Pacific Island economies and Timor Leste.[6] It is on the basis of the information collected on African economies – 27 at the time of writing – that the present analysis has been carried out (see Annex 1). The database covers 5 major service sectors that are further disaggregated into a total of 23 subsectors, namely financial services (commercial banking, life insurance, non-life insurance, reinsurance), telecommunications services (fixed-line, mobile, Internet), distribution (retail, wholesale), transportation (air freight domestic, air freight international, passenger domestic, passenger international, rail freight, road freight, maritime freight transport, maritime auxiliary services, maritime intermediation and other), professional services (accounting, auditing, legal services on foreign law, legal services on domestic law, advice and representation services).[7] See Annex 2 for more details on the sectoral and modal coverage.

Data on regulations and policies affecting services trade in African economies were collected through a survey conducted jointly by the World Bank and WTO (and partially supported by GIZ, the European Commission and the ITC) over 2020-2021. Although information was collected on regulations and policies affecting trade in all service sectors, the quantification (and subsequent trade cost analysis) has been run on only the 5 major service sectors already mentioned. But beyond the use of this information to compute the STRI, the collection of regulatory data pertaining to African countries has been conducted against the backdrop of the AfCFTA negotiations. Data collected for these countries covers

[3] For an overview of prior initiatives, please refer to Borchert et al (2019).

[4] While strictly speaking we do not cover "consumption abroad", a mode of delivery that is particularly important in services like tourism, education and health – sectors not currently covered by the database – we take in fact a broad view of 'cross-border supply', covering not only measures that affect the (foreign) supplier but also measures that apply directly to the consumer's capacity to consume services – or receives services from – abroad, such as the ability to make cross-border payments.

[5] The database is disseminated through the WTO website, at https://i-tip.wto.org/services/default.aspx.

[6] For the purposes of collecting data, these initial 68 economies were divided into two groups. For 25 of these economies the regulatory information underlying the updated STRI was collected through a survey conducted jointly by the World Bank and WTO in 2016-2017, while information for the remaining 43 economies was sourced from the OECD STRI regulatory database (2016 information), thanks to the cooperation of the OECD, which is gratefully acknowledged.

[7] At the time of writing, policy information in additional sectors including architecture, engineering, computer, construction, tourism, and health services is being collected for CEFTA Parties, Jordan, and other African economies.

almost all service sectors, i.e., sector coverage is wider than for the 76 economies mentioned previously, and is aimed to support countries' continental market access negotiations and beyond (other subregional, bilateral or multilateral negotiations), as well as assist in the identification of good regulatory practices and conduct various impact assessments, not only with regard to negotiating outcomes but importantly with regard to regulatory reform.

Measures affecting trade in services are organized on the basis of a classification jointly developed by the World Bank and the WTO, and consisting of four main policy categories: a) conditions on market entry, b) conditions on operations, c) measures affecting competition, and d) regulatory environment and administrative procedures. Relevant policy measures that potentially affect trade but do not fit neatly into any of these four categories are included in a fifth category – miscellaneous measures (see Box 1).[8]

Box 1: Structure of STPD classification of measures

A Conditions on market entry
- *A1 Legal forms of entry (including foreign equity limits)*
- *A2 Quantitative measures (for firms and natural persons)*
- *A3 Conditions on licensing/investment screening/qualifications relating to market entry (firms /natural persons)*
- *A4 Other conditions on market entry*

B Conditions on operations
- *B1 Conditions on supply of services*
- *B2 Conditions on service supplier*
- *B3 Conditions on government procurement*
- *B4 Other conditions on operations*

C Measures affecting competition
- *C1 Conditions on conduct by firms*
- *C2 Governmental rights/prerogatives (including public ownership)*
- *C3 Other measures affecting competition*

D Administrative procedures and regulatory transparency
- *D1 Administrative procedures*
- *D2 Regulatory transparency (including licensing)*
- *D3 Nature of regulatory authority (measures related to nature of regulator)*
- *D4 International standards*
- *D5 Other regulatory environment and administrative procedures*

E Miscellaneous

Every individual policy measure is mapped to one category in the above taxonomy and is generally defined in a binary way (yes or no response). As an exception to this rule, by their very nature a few measures require a quantitative reply (e.g. level of foreign equity allowed, number of days required to process a licence application). Each policy category includes measures from across all modes of supply as applicable; for example, category A

[8] For more information on the classification, see Borchert et al. (2019).

(conditions on market entry) will thus include the measures affecting entry through each of the modes of supply covered in the database, i.e. cross-border, commercial presence and presence of natural persons.

The meta-classification of measures described above is intended to facilitate convergence towards a single classification and quantification methodology. Therefore, the classification remains, at the measure level, fully compatible with the classification utilized in the OECD Services Trade Restrictiveness Regulatory Database and the previous classification of measures developed by the World Bank more than a decade ago.

2 MEASURING SERVICES TRADE RESTRICTIVENESS

The methodology used to generate the STRI is an updated and improved version of the STRI developed by the World Bank in 2012. In updating the previous World Bank STRI, the Bank and the WTO maintained the main principles but introduced several improvements, notably the use of an algorithm and an automatized aggregation method to construct the STRI. Introducing these technical improvements removes the subjective bias that may have existed in the previous World Bank STRI. The improved methodology will be briefly described below, and more information may be found in Borchert et al. (2019).

The construction of the STRI follows three principal steps:

1) the **selection** of key restrictions entering the STRI;
2) the **determination** of the level of restrictiveness of individual measures (or bundles of measures if they are conceptually intertwined, which we call 'synthetic measures'); and
3) the **aggregation** of measures into indices at the subsector-mode level, sector level, and economy level, respectively.

2.1 Selection

While the Services Trade Policy Database (STPD) contains a large number of measures, the index is based upon a subset of key restrictions that may affect significantly trade in services, approximately 115 regulations and policies. The choice of key restrictions entering the quantification exercise was driven by a number of considerations: 1) to cover the most significant restrictions – this was based on the previous analysis conducted by the World Bank as well as expert advice; 2) to respond to recent regulatory developments perceived as having a discernible impact on trade in services, e.g. investment screening policies or restrictions relating to cross-border data flows; 3) to ensure comparability with the 2008-2011 World Bank exercise; and 4) to adapt to – and be consistent with – the coverage of measures in the OECD database, which served as a fundamental source of information for economies covered by both the STPD and the OECD's regulatory database. The list of measures selected for the construction of the STRI is provided in Annex 5 of Borchert et al. (2019).

2.2 Determination of level of restrictiveness

Trade policies are assessed by looking at specific types of measures for each subsector and mode. For example, for commercial banking, we obtain separate measures for the cross-border supply, commercial presence and the presence of natural persons. We assign a score depicting the level of restrictiveness to each measure. For each individual measure, we generally consider 6 distinct levels of restrictiveness, each of which attract a different (monotonically increasing) score. Table 1 sets out these six levels of restrictiveness and provides a concrete policy example for each level.

Table 1: Examples of measures, level of restriction and associated score

	Examples	Score
Not restrictive	No restriction on the type of legal entity, no foreign equity limitation	0.00
Not restrictive, but minimal procedural/transparency issue	No provision for prior notice of, or comment on, regulatory changes	0.125
Minor restriction	Acquisition of land and real estate by foreigners prohibited	0.25
Neither minor nor major	Limit on number of suppliers	0.50
Major restriction	Service provision is reserved for statutory monopoly or granted on an exclusive basis	0.75
Closed (services provision not possible)	Commercial presence is prohibited	1.00

The new STRI is based upon six numerical levels, with the objective of the newly added 0.125 bin being to accommodate regulatory measures around transparency that impart only a minor effect on restrictiveness (e.g. publication of draft regulation and opportunity to comment). The aim is to take account of measures that are aspects of the regulatory environment rather than restrictions, not even minor ones, in regard of the actual supply of services but that can nevertheless adversely affect the policy or regulatory environment in which firms operate.

Assigning a restrictiveness score to a single measure is insufficient in some special circumstances, when policies that we record as separate measures are intertwined and, hence, their restrictiveness can only be assessed by considering the entire bundle of such measures. For example, foreign suppliers can in principle enter through mergers and acquisitions or via greenfield investment, and it does not make much sense to score restrictions for each route in isolation, for they represent alternative options. Rather, the difficulty of entering a market is most plausibly assessed by looking at the admissible combinations of entry options, rather than individual routes. We call such bundles 'synthetic' measures as they consist of two or more individual measures that are separate entries in the database but whose impact on restrictiveness is scored jointly for the purposes of constructing the STRI. Only when the assessment of restrictiveness, i.e. scoring, is complete at the measure level including synthetic measures, does the process of aggregation start.

2.3 Aggregation

The overall restrictiveness of a group of policy measures, e.g. at the subsector-mode level for a given economy, results both from the types of measures applied as well as from the number of measures applied. The severity of measures in curtailing services trade is captured directly in the scores assigned to individual measures (Table 1). In a second step, the set of individual measure scores needs to be aggregated to higher levels, such as for a given sector-mode or even an entire economy.

Aggregation of this kind is a challenge in a wide range of fields, such as in consumer or production theory. One of the most widely used mappings in economics for both utility and production functions is the 'Constant Elasticity of Substitution' (CES) functional form,

which generically combines an array of $i = (1, \ldots, N)$ elements x_i according to $X = \left(\sum_{i=1}^{N} x_i^{\alpha} \right)^{1/\alpha}$.[9] With just one parameter (α), the CES function offers a parsimonious way of calibrating the marginal contribution of an additional unit to an aggregate of utilities, inputs or, in this context, policy restrictiveness. For instance, adding a restrictive measure to a set of other restrictive measures should increase the overall restrictions index. At the same time, adding, say, a tenth restriction to a set of nine restrictions should conceivably have less of an impact on overall restrictiveness than applying the first or second restriction to an otherwise open sector. This is the equivalent to the property of 'diminishing returns' (e.g. to utility or output). Correspondingly, in the context of policy restrictiveness, adding more and more restrictions should add progressively less and less to the overall index number.

Against the backdrop of these intuitive underpinnings, we combine scores of individual measures m_i for group k according to the aggregator function in equation (1):

$$\text{STRI}^k = \left(\sum_{i=1}^{N} \left(m_i^{(k)} \right)^{\rho_k} \right)^{1/\rho_k} \quad (1)$$

The parameter ρ_k governs the way in which constituent scores are combined. In other applications, these groups k are sometimes referred to as "CES nests" and different values of ρ can be assigned to group k depending on the context. Specifically, higher values of ρ will lead to smaller incremental contributions of additional measures to aggregate restrictiveness. Figure 1 illustrates the role of this parameter on a set of 10 individual measures with a score of 0.25 each, for alternative values of ρ ranging from 1 to 10. For unit values of ρ, the aggregate score is the simple sum of constituent scores, i.e. $10 \times 0.25 = 2.5$. For high values of ρ, the aggregate score of a group of individual measures with a score of 0.25 each will be only marginally above 0.25. For values of ρ around 3, the aggregate score is slightly above 0.50.

Hence, large values of the ρ parameter are appropriate for aggregation if the policy measures in question have similar effects or are mostly substitutable. For instance, different forms of quantitative market entry limitations such as quotas and economic needs tests are likely to exert a similar effect on market entry. If a quota already applies to entry in a given sector and mode, then applying an economics needs test may not increase overall restrictiveness by much, since the main contribution to restrictiveness is already captured by the quota measure. This result will be achieved by aggregating both measure scores with a high value of ρ.

Conversely, if measures were regarded as adding significantly to the restrictiveness of already applied measures, e.g. operational restrictions that apply after any market entry limitations, then their relatively high marginal contribution to overall policy restrictiveness can be modelled with a lower value of the aggregation parameter ρ. For any given value of the parameter ρ, the CES aggregation will always exhibit the following four key properties that we regard as innovative for the construction of plausible restrictiveness scores: (i) the aggregate score of any arbitrary bundle of restrictions **does not depend** on the total number of measures considered for quantification; the restrictiveness score is (ii) **increasing in the number of restrictions** applied but (iii) **at a decreasing rate**, i.e. falling marginal restrictiveness of applied policies, and (iv) the marginal contribution to policy restrictiveness of a given measure is not fixed but **depends on the co-existence** of other applied measures. This last property renders the CES aggregation largely immune

[9] The parameter α takes on different interpretations according to the context in which the function is used; for instance, in consumer theory it is related to the elasticity of substitution among varieties consumed (σ).

against the double-counting of essentially irrelevant minor restrictions. Table 2 illustrates these four key properties with concrete numerical examples (assuming a value for ρ=3).

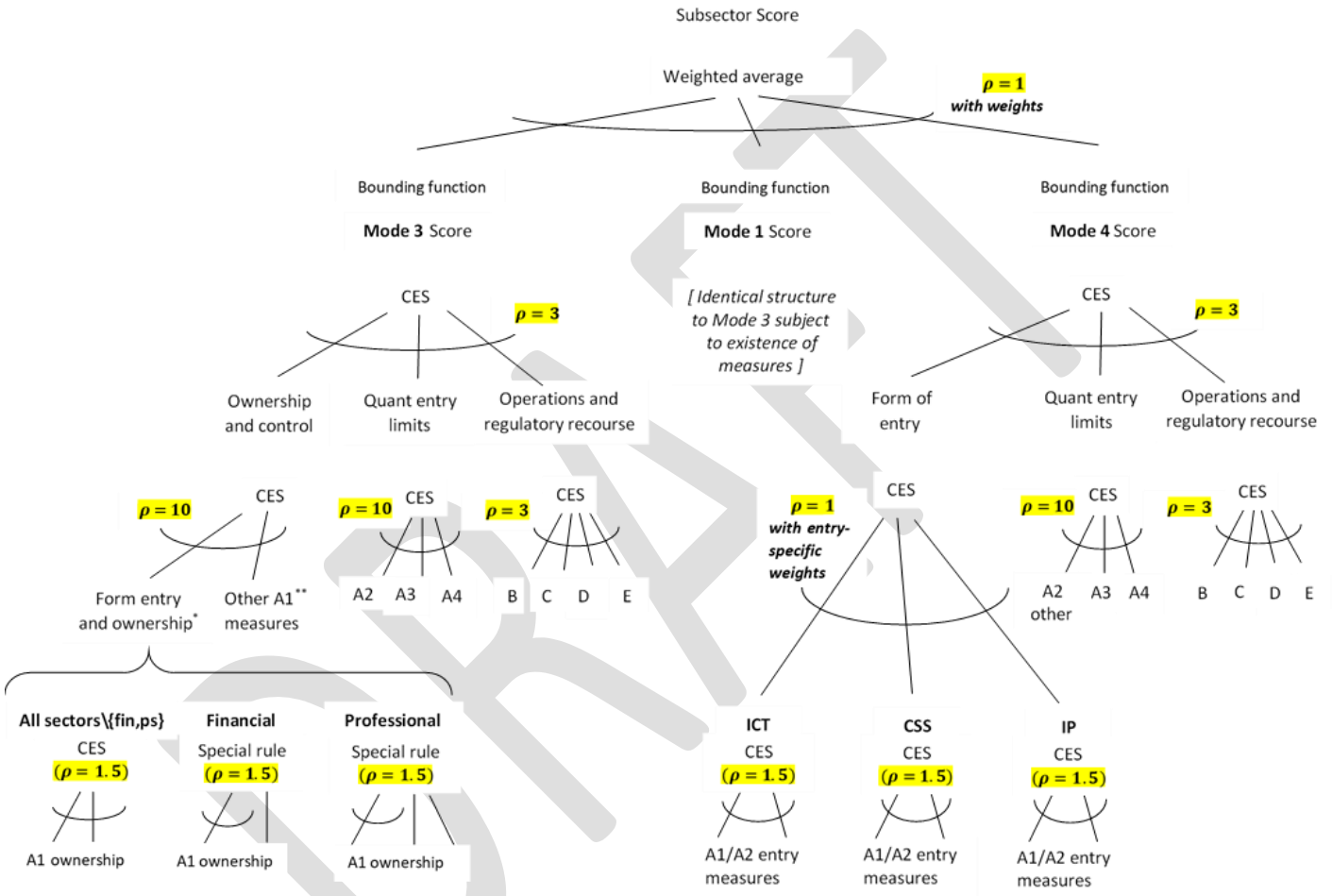
Table 2: Key properties of CES aggregation of policy measures ($\boldsymbol{\rho = 3}$)

Example set of measure scores (m_i)	**Aggregate index ($\mathbf{STRI}^k$)**	**Explanation**
0 + 0 + 0 + 0.50	0.50	The aggregate STRI is driven by actual restrictions and independent of the number of measures that are *not applied* in a given context.
0.50 + 0.50	0.63	The addition of a major restriction (0.5) to an already existing major restriction increases restrictiveness, but by less than 0.5.
0.50 + 0.50 + 0.50	0.72	The marginal contribution to restrictiveness is falling: the second 0.5 measure adds 0.13 and the third 0.5 measure adds 0.09. Taken together, the presence of three such moderate restrictions is roughly equivalent to the presence of one very restrictive measure that would be scored 0.75 on a stand-alone basis.
0.25 + 0.25 + 0.50	0.54	With two 0.5 measures in place, adding a third such measure adds merely 0.09 to overall restrictiveness (previous row), whereas with two 0.25 measures in place (aggregating to 0.32), adding a 0.5 measure adds 0.22 to overall restrictiveness, which is commensurate with the fact that this third measure renders the bundle considerably more restrictive. Viewed from an alternative perspective, adding two minor 0.25 measures to a pre-existing 0.5 measure leaves restrictiveness virtually unchanged (incremental 0.04), because minor restrictions matter less in the presence of a major restriction.

As is well known, CES functions of the type outlined in equation (1) can be nested to accommodate different layers of aggregation, with each nest potentially having a different CES parameter.[10] We take advantage of this **modular property** and break down the aggregation of scores across the universe of all measures into several steps, so that bundles of policy measures that bear a similar relationship with each other in terms of substitutability or complementarity correspond to a CES nest with a suitably chosen parameter. The combination of individual measure scores to subsector-level STRI values follows the conceptual classification of measures as set out in Box 1 above. This is because measures within a given category naturally share a similar relationship vis-à-vis each other, so that they form "nests" that can be aggregated with one suitable chosen ρ parameter.

[10] For instance, in modeling production processes, it is not uncommon to have an upper-layer Cobb-Douglas version for combining a numeraire good with a bunch of differentiated intermediate inputs, which emerges in equation (1) as the limit case of ρ going to zero, and another nest that would aggregate the differentiated inputs using the CES structure within that Cobb-Douglas aggregator.

Figure 1: Structure of multi-layered aggregation of measure scores



Source: authors' representation. Notes: * Policy measures (including synthetic measures) considered as part of 'entry and ownership' for mode 3 are greenfield entry and mergers and acquisitions entry, respectively, in all sectors, and branch entry for financial subsectors, and partnership and sole proprietorship in professional services subsectors. For mode 4, these relate to the different categories of natural persons allowed to enter the market (Intra-Corporate Transferees, Contractual Service Suppliers-CSS, Independent Professionals/self-employed-IP). ** The letters A1 to E refer to the principal categories of the measure classification, as set out in Box 1. Thus, "A1" encompasses additional measures of market entry not already included in 'entry and ownership'; e.g. a joint venture requirement or majority of nationals (or residents) on the board of directors.

As shown in Figure 1, we first aggregate all scores pertaining to forms of entry (category A1). This aggregation is performed with a parameter value of $\rho = 10$ because the remaining measures in category A1, if applied in combination with "entry and ownership" restrictions, do not add much to overall restrictiveness. We also use a parameter value of ρ=10 for the remaining entry measures reflecting *de jure* and *de facto* 'quantitative entry limits' (i.e. categories A2-A4: quantitative restrictions, licensing relating to market entry, other market entry measures), because the combined use of more than one such measure will ordinarily not add much to the overall restrictiveness of quantitative entry limitations.

Policy measures from all other categories of Box 1 (B, C, D and E) are combined into a score capturing restrictions affecting "operations and regulatory recourse." In this instance, a low value of the aggregation parameter ($\rho = 3$) is appropriate to reflect the mostly additive nature of these measures. For instance, not having the right to appeal regulatory decisions should arguably always add to the overall restrictiveness of those policy measures, regardless of whether some minimum share of employees is required to be nationals.

All three principal nests (ownership, quantitative limits and operations) are then combined with a value of $\rho = 3$ into an overall score per mode of supply. The rationale for using this parameter value is that at this specific stage, each constituent score should add to restrictiveness albeit moderately so (see Figure 1). For consistency reasons, the nested aggregation is in principle the same within each mode of supply, including the chosen parameters for ρ per nest, unless there is a compelling reason to deviate as when, for instance, the nature and number of measures on market entry differ across Modes 1 and 4. An additional advantage of this modular structure, which follows our taxonomy, is that the distribution of restrictiveness (across economies and sectors) is easily made transparent at each stage of aggregation—or "CES nest"—showing which kind of policy measures drive the overall distribution of STRI values, see Figure 4 in Borchert et al. (2019).

At this point we have aggregated all individual measure scores to one STRI value per subsector and mode. Yet using a concave CES function to aggregate a set of individual measure scores yields a value that is in principle unbounded. Therefore the resultant score could potentially exceed the admissible range for the STRI, i.e. the interval between zero and one (up to scale). Thus we apply a monotone transformation to ensure that the CES index only approaches 1 in the limit. The generalised logistic function is a natural candidate to map the positive real line into the unit interval. That function has 5 free parameters (denoted by A, B, K, Q, η) and takes the following form:

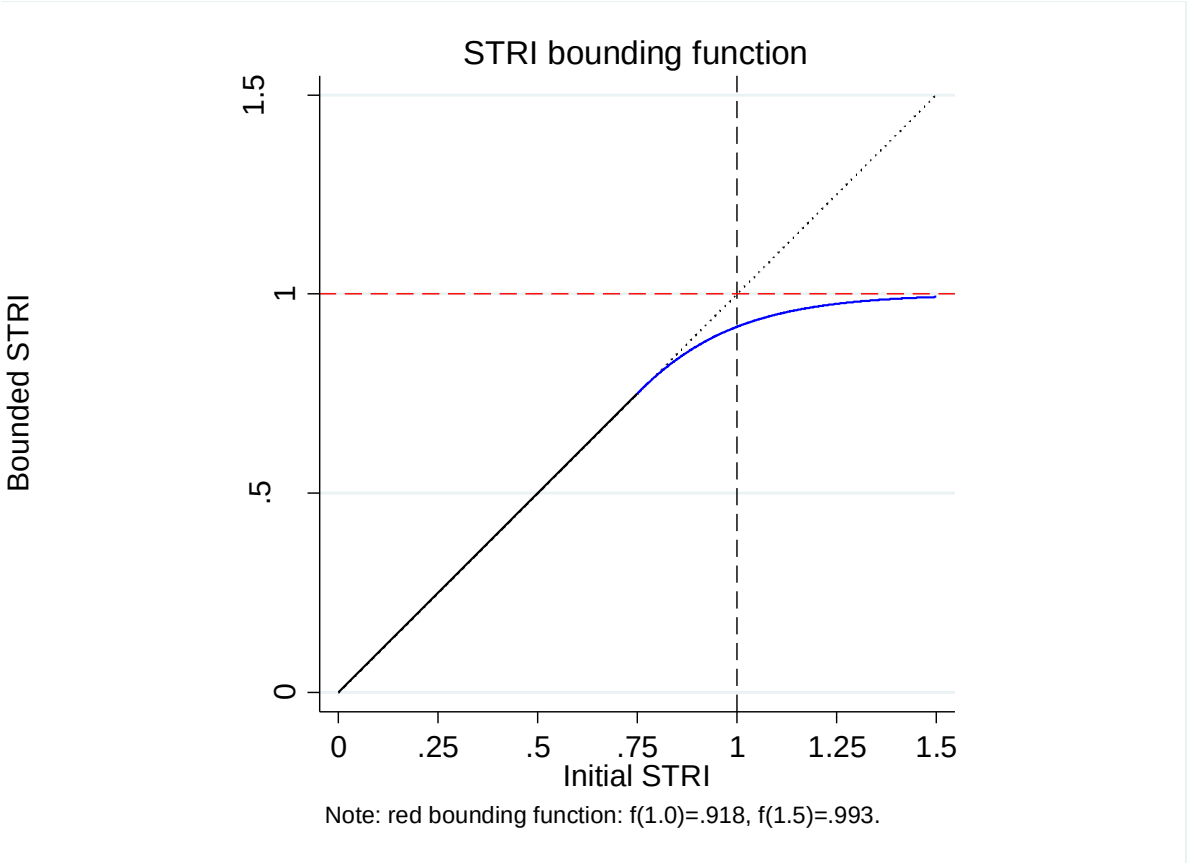
$$f(x) = A + \frac{K-A}{(1+Qe^{-Bx})^{1/\eta}} \tag{2}$$

With a suitable choice of parameters, the function takes on a sigmoid shape and its location and curvature can be modified so that the transformation only applies to large STRI values, thereby leaving low STRI scores unaffected. In fact, we define a two-part bounding function and choose parameters so that the logistic function's concave part is tangential to the 45 degree line at the point where STRI scores would take a value of 0.75, thereby avoiding any discontinuity in the bounding function. The following fully parameterized specification of a generalised logistic function represents the most parsimonious approach that ensures that STRI values alyways stay within the admissible range, whilst at the same time causing no distortion to lower STRI values that are faraway from the value of 1 (which continues to be reserved for closed subsector-modes):

$$f(x) = \begin{cases} x, \ \forall\, x \in [0, 0.75) \\ \frac{1}{(1+5e^{-5x})^{2.58765}}, \ \forall\, x \in [0.75, \infty) \end{cases} \tag{3}$$

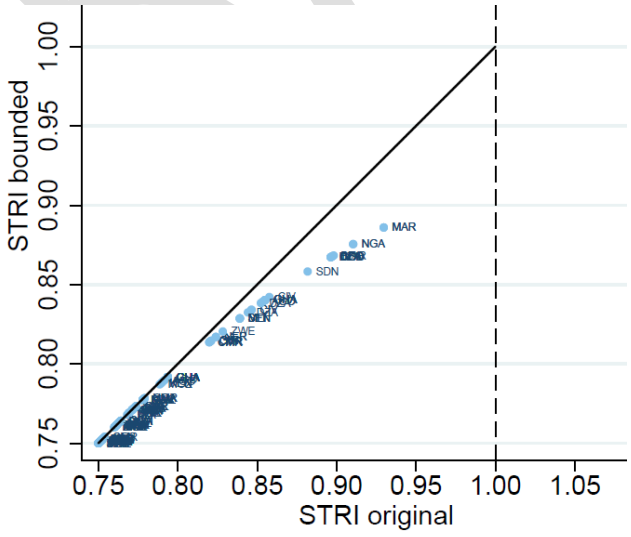
In terms of the general form in equation (2), the function that we apply has parameter values $A = 0,\ K = 1,$ $B = 5,\ Q = 5,\ 1/\eta = 2.58765.$ Figure 3 displays the bounding function defined in equation (3).

Figure 3: Two-part bounding function



Note: red bounding function: f(1.0)=.918, f(1.5)=.993.

Figure 4: Application of bounding function to sample of 27 AU economies



Note: only adjusted scores (>= 0.75) shown.
Share of adjusted scores excl closed ones: 11.4 percent

The next step is to combine the modal scores to one STRI value per subsector and, eventually, per economy. We do this with a weighted arithmetic average, with a set of weights that differs across subsectors, reflecting the relative importance of the three modes for the provision of a given service, see Table A6.2 in Annex 6 in Borchert et al.

(2019). Setting the aggregation ρ parameter to unity in equation (1) yields the arithmetic average as a special case of the CES with weights. We are therefore not stepping outside the framework we have consistently employed thus far. However, the aggregation of scores from different modes is different from the aggregation of measure scores because in any sector, one mode of supply will invariably be more important than others so that the symmetric treatment of measure scores is no longer appropriate for this step of the aggregation.

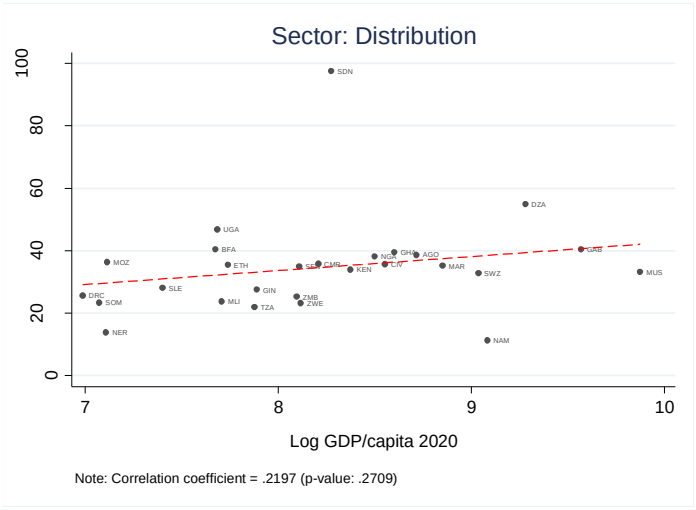
In summary, the new aggregation methodology offers *conceptual* as well as *practical* improvements. Its modular structure affords the flexibility to accommodate a range of different tasks in one framework, from the aggregation of measures that are nearly additive to those whose incremental impact on restrictiveness is almost negligible. At the same time, the approach is extremely parsimonious and fully transparent. In addition, STRI scores thus constructed are reproducible, implying that comparable scores for new economies or sectors can be obtained as the STPD is continuously being expanded.

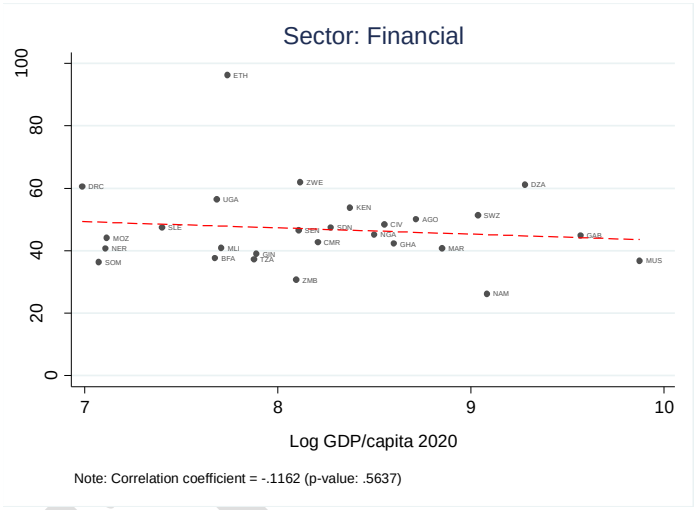
3 PATTERNS OF SERVICES TRADE POLICY

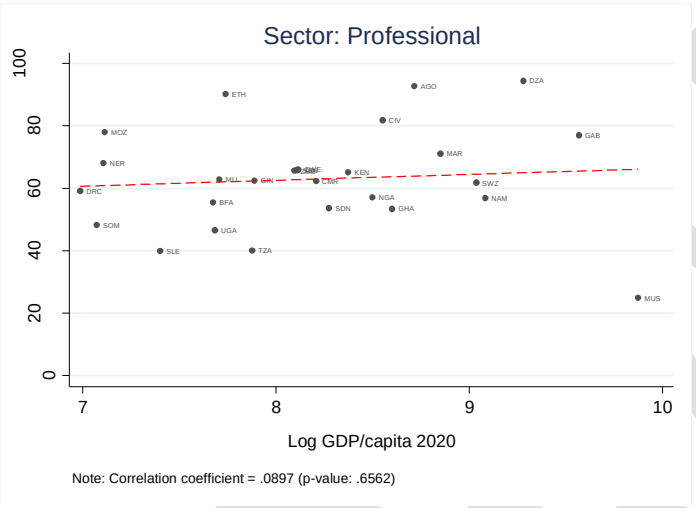
Openness to services trade differs substantially across the economies covered by this study. Contrary to what was witnessed in studies covering other economies (see Borchert et al 2020), at the broad sector level, there is typically no discernible relationship between services policy restrictiveness and stage of development (GDP/capita) for this group of 27 African Union economies (figure 5). It is worth noting nonetheless that especially for poorer economies apparent openness may rather reflect an underveloped regulatory framework or in some cases lack of sector-specific regulation – it is likely that this factor is playing a role in the set of economies that are covered here (e.g. Sierra Leone, Somalia).

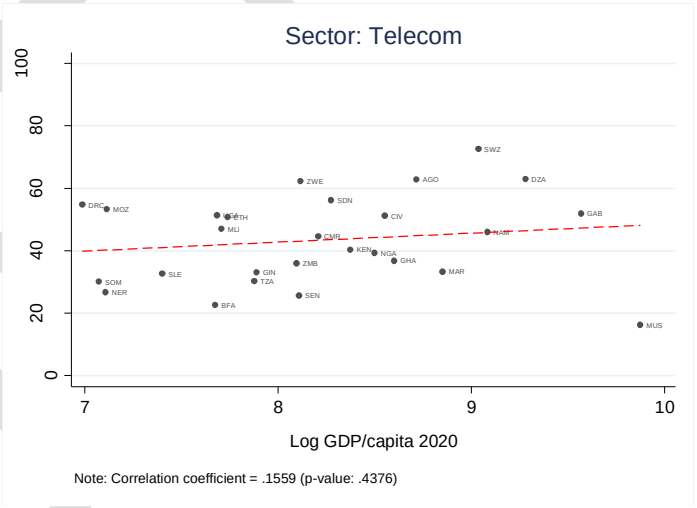
Across the five sectors analyzed, as for most economies covered by the STRI in 2016, distribution appears to be the most open sector (with a median STRI of 35). This is followed by telecommunciations (44, on average higher than countries covered in the 2016 sample), financial services (45, at a level lower than the 2016 middle income countries) and transport (48). Professional services remains the most restricted sector with a median STRI of 62.

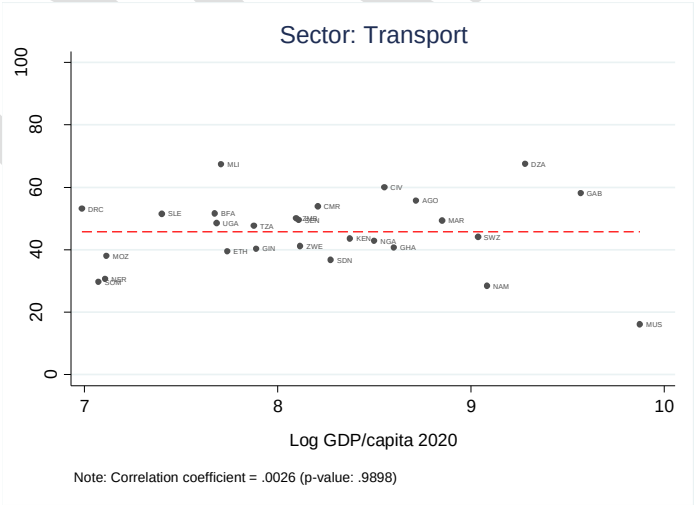
Figure 5: STRI by sector and level of income





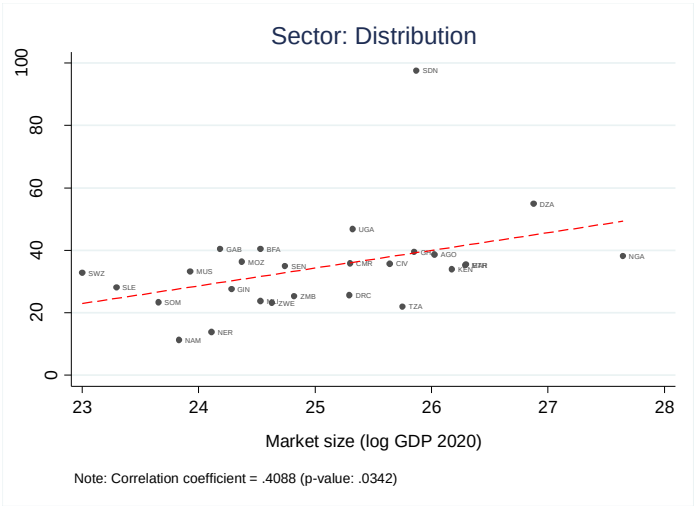


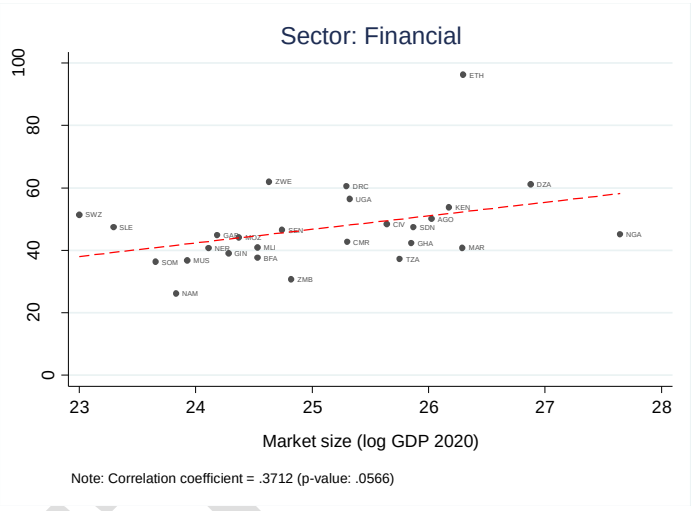


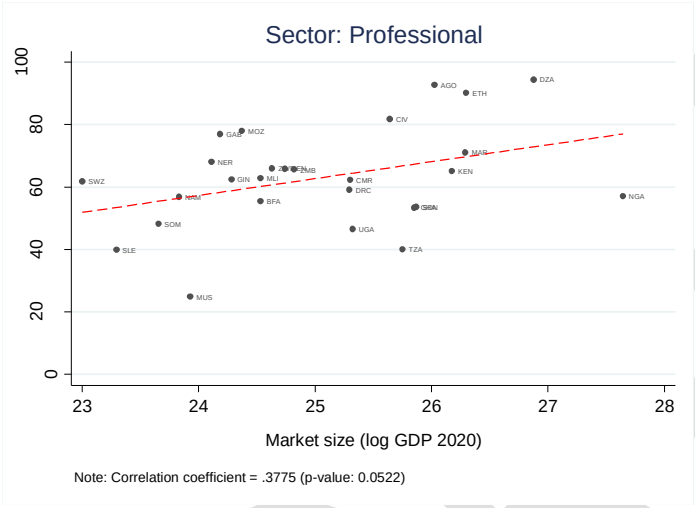


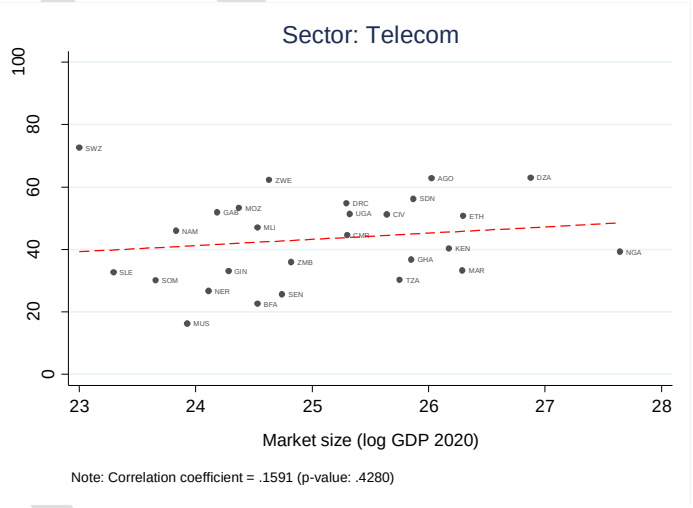
However, there is a significant relationship with market size in most broad sectors: smaller economies tend to be more open (see figure 6). The largest positive and significant correlations are found in distribution, professional and financial services sectors. Some of the economies have not yet gone through a deep liberalization process in many sectors, and also continue having restrictive horizontal FDI policies such as Ethiopia and Algeria.

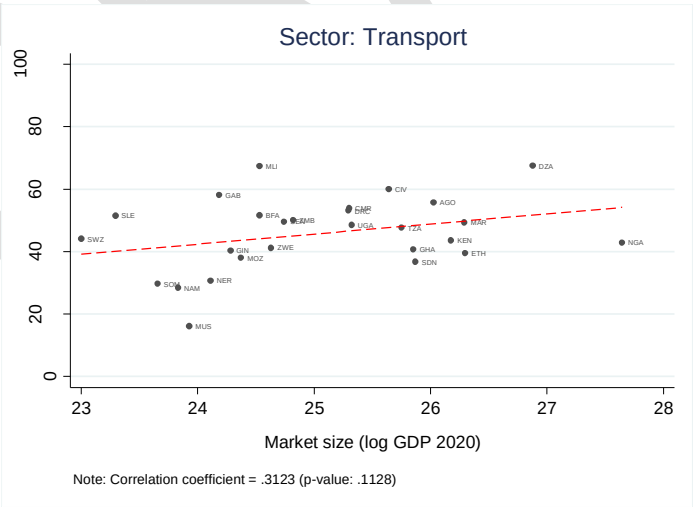
Figure 6: STRI by sector and market size









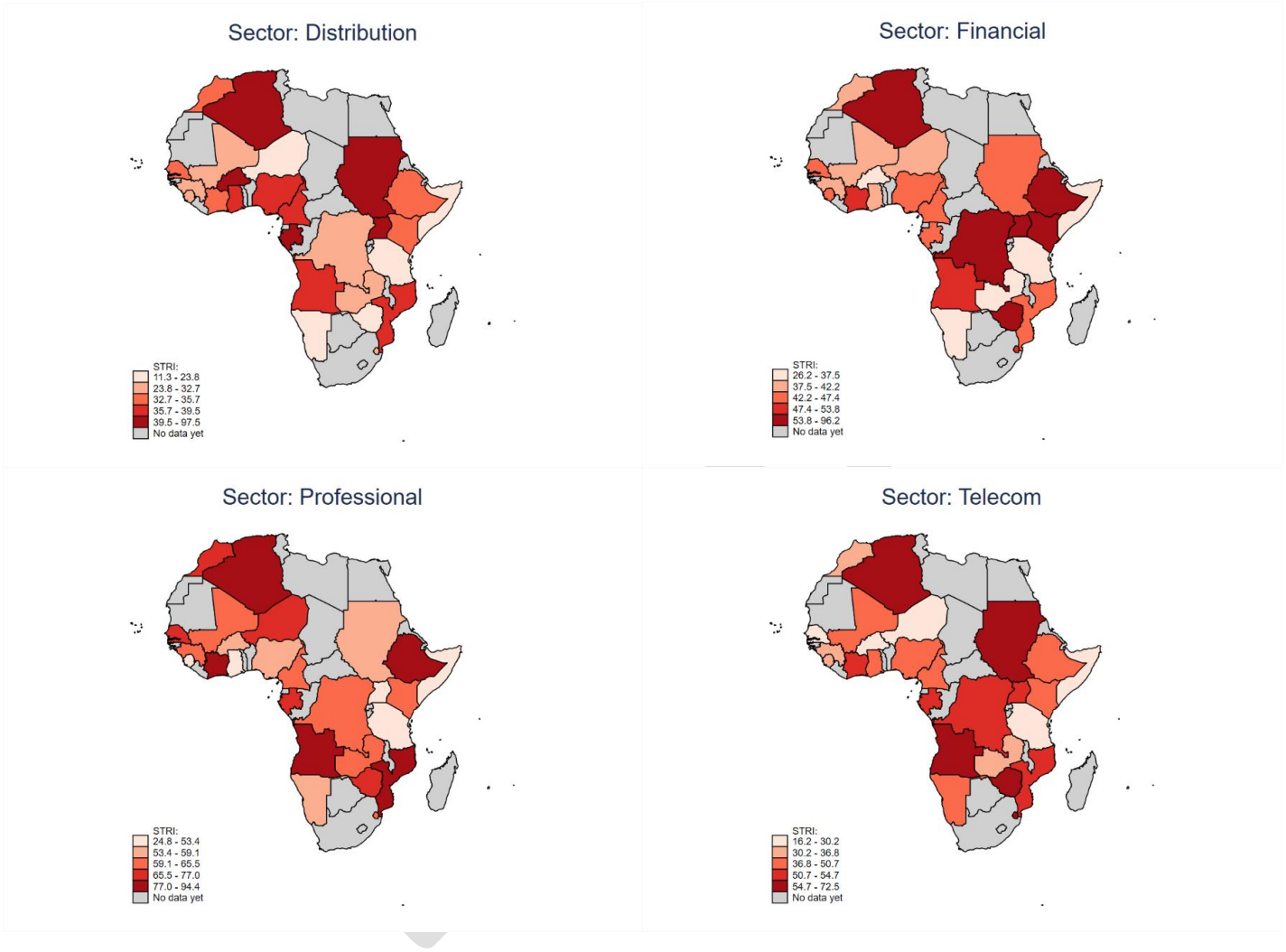


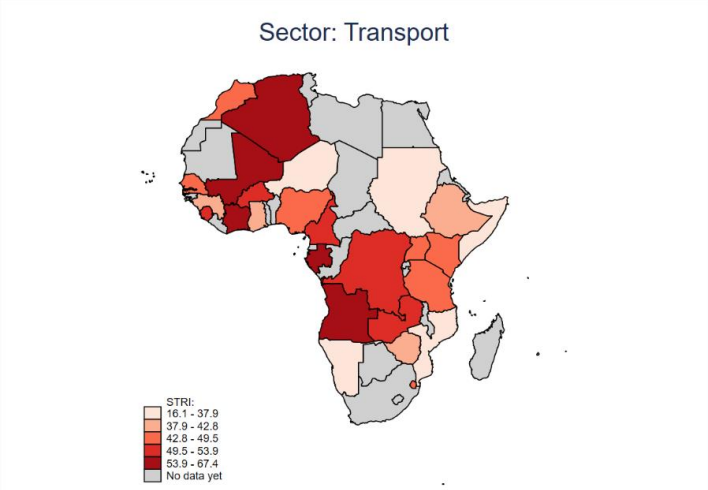
Across services sectors, the pattern of protection may be gauged with the aid of the maps shown in figure 7. It is in fact not that different from that of other economies (Borchert et al., 2020). Distribution appears as the most open sector in these 27 economies. The level of restrictiveness in this sector is generally lower than in the other sectors (only 5 economies feature a score above 39.5), and a majority of economies (17) appear with a score lower than 35.7. Only one economy (Sudan) has the sector virtually closed to foreign participation.

The level of protection in financial, telecommunications and transport services seems comparable. In the three sectors only a handful of economies have scores above 60 (4 in financial and telecommunications, and only 3 in transport services). The majority of economies feature scores between 37 and 60 (17 in financial, 16 in telecommunications and 20 in transport).

Professional services are the most restricted, with a majority of economies (17) featuring scores above 59 (10 out of them present scores above 65.5). Only one economy (Mauritius) has a score lower than 40.

Figure 7: STRI by sector and country





Note: Mauritius included but too small to be visible in above maps.

Within these 27 economies, which are the most open and the most restricted? One approach to identify this is to look at the number of sectors where foreign participation is not allowed. Table 3 summarizes the number of subsector-modes of supply combinations that appear as "closed" in the Services Trade Policy Database, i.e. market entry or service provision by foreign suppliers is not possible in this instance. Mauritius, has no services subsector-mode entirely closed, and is the most open economy of this group. Other countries with a small number of subsector-mode closed include Nigeria, Uganda, Sierra Leone, Ghana, and Namibia , where less than 3 subsector-modes are closed to foreign supply. At the other end of the spectrum, Ethiopia appears by far as the most restricted economy – with 26 subsector-modes combinations closed – followed by Angola, Algeria, Sudan, Côte d'Ivoire, and Mali, where at least 10 subsector-modes are closed.

Table 3 Number of closed subsector-modes of supply combinations

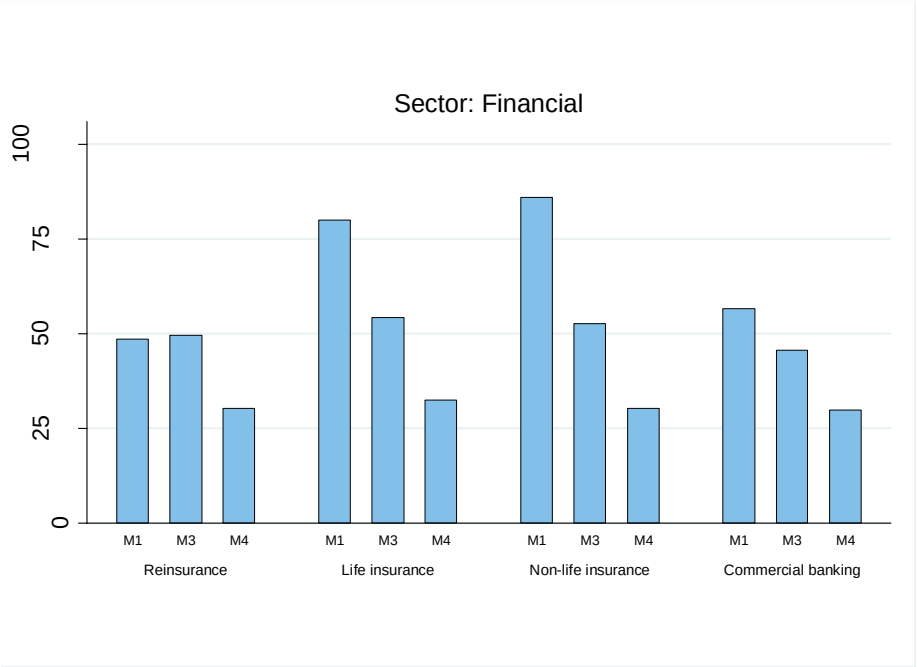
Country	Mode M1	M3	M4	Total
Ethiopia	8	9	9	26
Angola	7	4	4	15
Algeria	5	5	2	12
Sudan	7	3	1	11
Côte d'Ivoire	7	2	1	10
Mali	5	2	3	10
Burkina Faso	5	2	1	8
Zambia	2	3	3	8
Gabon	5	2	0	7
Morocco	5	2	0	7
Senegal	5	1	1	7
Cameroon	5	1	0	6
Dem. Rep. Congo	4	2	0	6
Kenya	4	2	0	6
Niger	4	1	1	6
Zimbabwe	3	3	0	6
Guinea	4	1	0	5
Swaziland	2	3	0	5
Mozambique	0	3	1	4
Somalia	0	3	1	4
Tanzania	4	0	0	4
Namibia	0	3	0	3
Ghana	2	0	0	2
Uganda	2	0	0	2
Nigeria	1	0	0	1
Sierra Leone	0	1	0	1
Mauritius	0	0	0	0

Another way of considering the level of restrictiveness, is to to review the STRI for each economy across the sectors analyzed. From this perspective, Mauritius and Namibia appear as the most open economies. Mauritius featured the lowest scores across professional, telcommunications and transport services, and among the lowest scores in financial services. Interestingly, in the case of distribution services, the level of protection in Mauritius is not among the lowest of the group. Namibia features the lowest scores in distribution and financial services, and among the lowest in the other sectors. On the other side of the spectrum, there is one economy that appears consistently among the most restricted across sectors: Algeria. In addition to Algeria, across sectors, the most restrictive economies are the following: Sudan, Burkina Faso and Uganda (distribution, scores higher than 40); Democratic Republic of Congo, Ethiopia and Zimbabwe (financial, scores higher than 60); Angola, Côte d'Ivoire and Ethiopia (professional, scores above 80); Angola, Eswatini, and Zimbabwe (telecommunications, scores above 60); and Côte d'Ivoire and Mali (transport, scores above 60).

As can be seen in the graphs below, there is substantial variation in policy restrictiveness across **modes of supply** in the various sectors. Some plausible patterns can be observed. For instance, cross-border supply (Mode 1) tends to be more restricted in financial services, as regulators prefer to have foreign suppliers onsite for reasons of prudential

oversight (figure 8). This is visible in commercial banking and even more so in life insurance. Mode 4 restrictiveness in the sector is mainly driven by horizontal policies such as labour market tests, that limit the ability of multinational firms to transfer their essential staff within the company (which is also trues for all other sectors covered by the study).

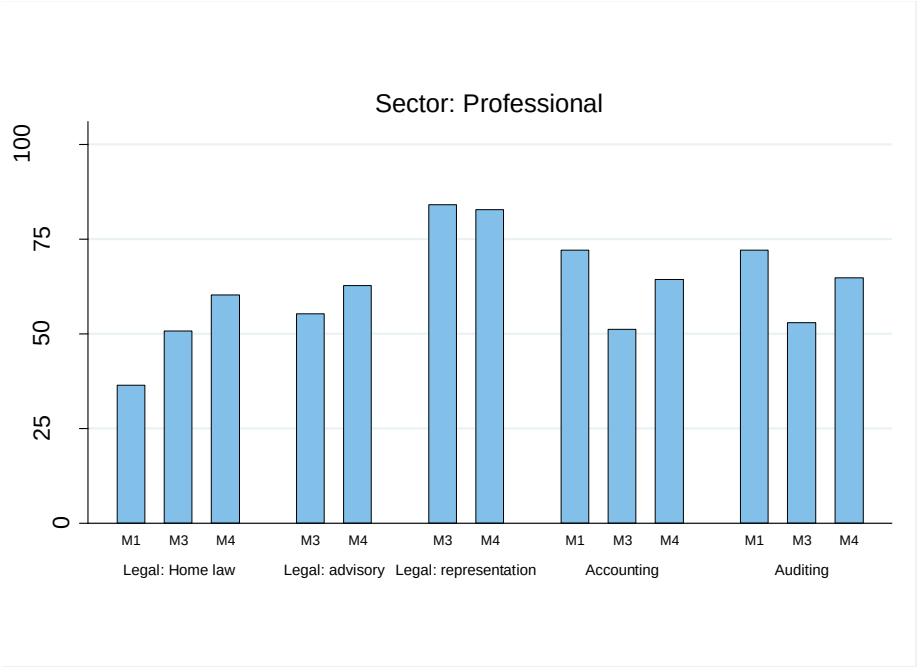
Figure 8: STRI by financial services subsectors and modes of supply



Professional services are traditionally also a heavily regulated sctor, with many trade restrictive policies in place. In legal services, modes 3 and 4 are rife with restrictions in many economies in the region, in particular for legal representation services, thereby reflecting the generally high level of policy restrictiveness in professional services (figure 9).[11] Conventionally Mode 4 is usually very restricted with nationality and residency conditions to be authorized to practice, a fact that is confirmed in many countrie in our sample. Only in rare cases there can be temporary authorization (i.e. for a specific case in court), but often under stringent conditions (e.g work with a locally licensed profesional). Also, the conditions on the professionals often have implications for establishment, as in many cases the partnership should be amongst locally licensed professionals, or with a majority shareholding of locally licensed professionals. Legal services on foreign or international services are generally more liberal, and cross-border supply is usually hindered by minor restrictions. We can draw a similar pattern for mode 3 and mode 4 in accouting and audting services, the two other professional services subsector covered in this study, although for mode 3 the conditions are less stringent than in legal services. For example, in a number of countries the shareholding permitted for (non-locally licensed) foreigners is higher than what is seen in legal services. However, cross-border supply is much more restricted in accounting and auditing services compared to modes 3 and 4, and at level much higher than witnessed for other countries covered in the 2016 exercise.

[11] Note that for legal services on host country law, only Modes 3 and 4 are available in the database (cross-border supply is essentially deemed infeasible).

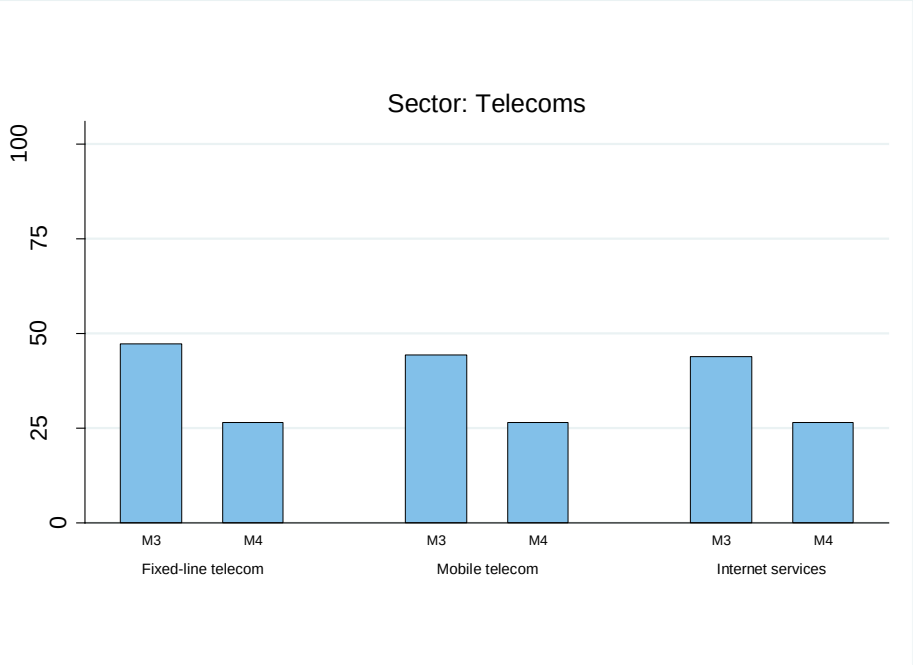
Figure 9: STRI by professional services subsectors and modes of supply



In telecommunication services, policy restrictiveness is overall much lower, as can be seen in figure 10. This is a trend observed in most countries around the World, reflecting the continuous introduction of competition and regulatory reform of the sector across economies since the 1990s. However, there is still some emphasis on restricting Mode 3 in a few economies.[12]

[12] Note that the current version of the Services Trade Policy Database does not cover Mode 1 across the three telecoms subsectors.

Figure 10: STRI by telecommunications services subsectors and modes of supply

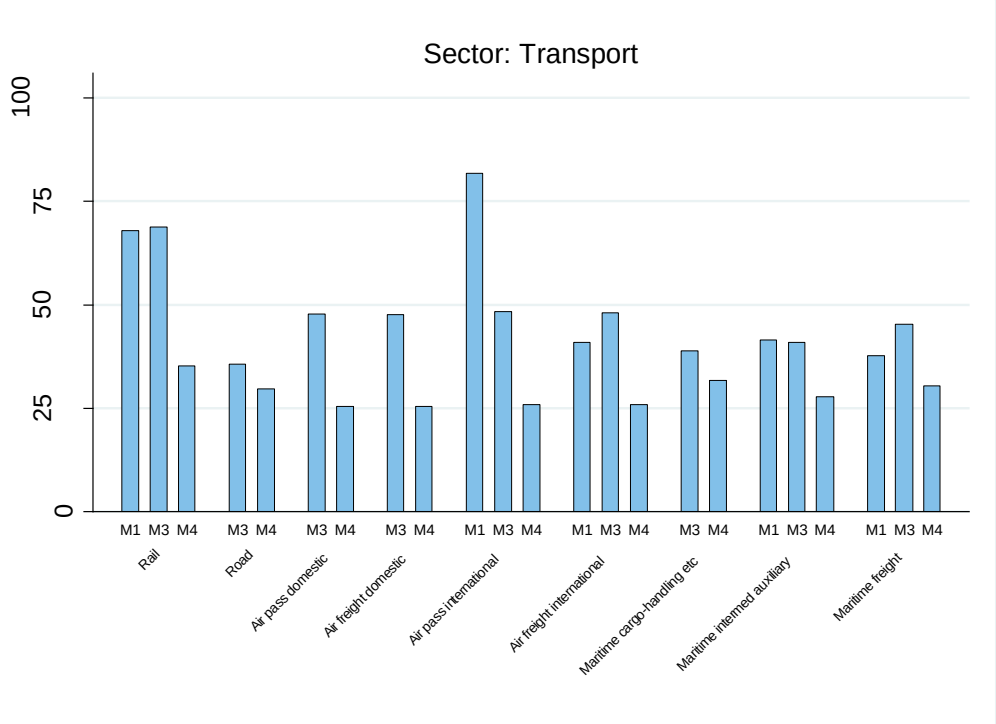


Among transport sectors, road (limited to mode 3 in the report) is the most liberal sector in the region, followed by maritime shipping and auxiliary services (figure 11).[13] For the latter this represents the overall openness of the sector for cross-border supply, as well as the establishment of services providers for reasons other than flying the national flag (which may in turn imply that foreign suppliers cannot operate in certain activities, such as as cabotage, reserved cargoes etc.). Rail and air transport are the most restricted. For rail, this reflects the inherent difficulty to introduce competition in the sector which is mainly linked to the infrastructure situation in many ecomies in the region where often there is only one or two tracks in place, which are entirely exploited/maintained by the incumbent operator.[14] Although still highly restricted for mode 3 (average score just below 50), it seems that the 27 African countries covered have a relatively lower score compared to what was witnessed in other countries in 2016. This may reflect the will to develop the sector in many of those countries. However mode 1 in international air transport is highly constrained. Overall mode 4 is mildly restricted in all transport sectors, as beyond the horizontal applicable policies (e.g. labour market tests or quotas), there may be a number of activities in the sector that are reserved to nationals (e.g. composition of crews, cargo handling).

[13] Notice that in figure 11, landlocked economies are omitted as maritime is not applicable. Mode 1 for road is also not covered. It is mainly driven by bilateral traffic sharing agreements, and to date it has proved difficult to gather information. Also, mode 1 for road trasnport for remote island exconomies is not considered. Note that mode 1 for road transport is usually highly restricted on an MFN basis.

[14] Note that where the infrastructure is inexistent we did not compute the STRI (in particular within countries for mode 3, or across borders for mode 1).

Figure 11: STRI by transport services subsectors and modes of supply



Distibution services is the least restricted sector, presenting relatively low STRI scores, both for cross-border supply and commercial presence (figure 12). However, it is important to note that certain regulations are still restrictive in a number of juridiscitons where smaller (specialized) retailers/wholesalers are protected.

Figure 12: Distribution STRI by modes of supply

4 SERVICES TRADE COSTS

4.1 AVE derivation[15]

Before turning to the simulation of change policy scenarios, this section sets out how our estimated ad valorem equivalents (AVE) arise from a structural gravity framework adapted to cater for regulatory barriers to services trade. We construct the ad valorem equivalents as reflecting the percentage change in iceberg trade costs that is associated with a given change in an NTM affecting services trade. We follow the exposition of AVE construction in Bekkers and Rojas-Romagosa (2018) but make conceptual adjustments for the fact that in our context NTMs affecting services trade are captured by the STRI, which is a quasi-continuous variable that ranges from 0 to 100. In order to derive the percentage change in iceberg trade costs, consider the generic expression for the value of bilateral trade, V_{ij}, as set out in the theory of structural gravity (Anderson and Van Wincoop, 2003):

$$V_{ij} = \left(\frac{((1+t_{ij})\tau_{ij})}{\Pi_i P_j} \right)^{-\theta} Y_i E_j \qquad (4)$$

where t_{ij} collects any ad-valorem trade costs, τ_{ij} is the trade cost function (to be further specified below) for any other non-tariff barriers, Y_i is total output in exporting economy, E_j is total expenditures in the importing economy, and Π_i and P_j are the outward and inward multilateral resistance terms, respectively. The parameter θ denotes the trade elasticity that may have different structural interpretations depending on the micro-foundation of the structural gravity model (Arkolakis, Costinot, and Rodriguez-Clare, 2012).

With a view to estimating the empirical gravity equation with a Poisson PML, as is standard practice, we specify the conditional mean of bilateral trade as being of the exponential form and so arrive at the following estimable equation for bilateral trade:

$$V_{ij} = \exp\{-\theta \ln(1+t_{ij}) - \theta \ln \tau_{ij} + \ln \eta_i + \ln \nu_j\}\varepsilon_{ij} \qquad (5)$$

Services trade policies are incorporated into equation (5) by fully specifying the trade cost function for iceberg trade costs ($\ln \tau_{ij}$). This trade cost function collects all other frictions to bilateral trade from geography to policy and institutions.

At this stage of specifying the trade cost function for iceberg trade costs ($\ln \tau_{ij}$), we deviate from the exposition in Bekkers and Rojas-Romagosa (2018) two principal respects: first, since we are primarily interested in gauging the effect of the STRI on services trade, we disregard expressions for discrete NTMs and henceforth only consider continuous types of NTMs. Second, and conceptually more important, we recognise that the STRI variable constitutes an importer characteristic reflecting most favoured nation policies, rather than a bilateral variable reflecting exporter-specific policies. But the effect of country characteristics cannot be evaluated empirically with a correctly specified gravity model that contains full sets of exporter- and importer fixed effects, respectively.

To make progress nonetheless, we include intra-national trade flows in our services trade data and evaluate the effect of STRI on border-crossing trade flows relative to internal trade flows. Econometrically, this is implemented by an interaction effect between an

[15] This section is based on Ingo Borchert, Joscelyn Magdeleine, Juan A. Marchetti and Aaditya Mattoo (2021) Estimating Services Trade Costs: Evidence from the Services Trade Policy Database, mimeo, University of Sussex, draft May 2021. For a detailed derivation of AVE expressions, please refer to the Annex in that paper.

indicator variable for border-crossing flows (BRDR) and logged values of the STRI. Hence, the expected value of the trade cost function takes the form

$$E[\ln \tau_{ij}|X_{ij}] = \frac{\beta' C_{ij} + \ldots + \gamma_1 BRDR_{ij} + \gamma_2 (BRDR_{ij} \times \ln STRI_j)}{-\theta} \qquad (6)$$

The vectors β and γ represent estimated coefficients from the gravity model, which includes the coefficient of interest, γ_2, on the interaction term between Border and logged STRI values. Since the AVE represents the percentage change in iceberg trade cost with respect to a change in a non-tariff measure (here the STRI), we are now in position to derive expressions for AVEs. For any arbitrary discrete change in economy j's STRI, the AVE associated with such change is:

$$\begin{aligned} AVE_j^d &\equiv \frac{\tau_{ij}|STRI_j^1}{\tau_{ij}|STRI_j^0} - 1 \\ &= \left(\frac{STRI_j^1}{STRI_j^0}\right)^{-\frac{\gamma_2}{\theta} \times BRDR_{ij}} - 1 \end{aligned} \qquad (7)$$

Equation (7) represents the exact expression for an arbitrary change in a continuous NTM from one value to another. Notice that the empirical estimate of the gravity coefficient in expression (7) will typically be negative ($\gamma_2 < 0$) since the effect of policy restrictions will most likely be to reduce the value of border-crossing trade flows relative to internal services trade; if that is so, the exponent will evaluate to a positive number.

4.2 Trade cost simulation of services policy reform

As equation (7) shows, the construction of AVEs requires three pieces of information: (i) a change in policy restrictiveness (STRI), (ii) an empirical estimate of γ_2, and (iii) a value for the trade cost elasticity θ.

For a country- and sector-specific change in STRI, we may use changes in STRI that may have actually ocurred in the past (e.g., between two dates in time) as we did before on the basis of changes occurred in STRIs between 2008 and 2016 (Borchert et al. 2020 and 2021), or we may use simulated or counterfactual changes in policy, be it at the level of specific measures or as overall changes in STRIs (so as to gauge the impact on trade costs). This involves a two-step process: firstly, the simulated change in policy, which results in a new set of STRIs – we will explain the two policy scenarios in the following section – and, secondly, plugging the new STRI scores into equation (7), along with an estimate of $\hat{\gamma}2$, to obtain an ad-valorem equivalent trade cost change.

The estimate of γ_2 will be obtained from a structural gravity model of cross-border services trade flows as the coefficient on the interaction term between logged values of the STRI and an indicator variable for border-crossing trade flows.

From a theory point of view, the parameter θ is closely related to the elasticity of substitution, or the elasticity of demand with respect to relative prices. Indeed, in the gravity framework $-\theta = (1 - \sigma)$ where σ denotes the elasticity of substitution. The literature that has attempted to estimate substitution elasticities for services trade is scant (Benz and Jaax, 2020, Breinlich, 2010). We assume $\sigma = 2.5$ as a "consensus estimate"

from the literature and evaluate the AVEs for values of $\theta = 1.5$, though empirical results below contain robustness checks for alternative values of θ as well.

Consider how the AVEs obtained from equation (7) should be interpreted. Inferred from a full set of bilateral service trade flows, these quantities show by how much, in percentage terms, a given change in policy restrictiveness from $STRI_j^0$ to $STRI_j^1$ alters the border effect. This border effect measures the friction that trade flows are subject to because they cross an international border, compared to internal trade that does not need to cross a border. This interpretation has two implications. First, the trade cost estimate of these AVEs is not a direct effect on the value of services trade but rather the change in the value of border-crossing services trade because the border friction has changed. Any proportional change in both intra-national and international services trade will not be picked by the structural gravity estimation. Against that backdrop, the AVEs associated with policy changes as estimated in this section should be regarded as a conservative lower bound.

Second, and perhaps more importantly, the AVEs represent trade cost implications associated with policy changes, where the initial set of policies correspond to a score of $STRI_j^0$ and the new set of policies is denoted by $STRI_j^1$. As such, the AVEs do not give an indication of trade costs entailed by a certain level of policy restrictiveness. Put differently, we do not quantify an STRI of 50 as being equivalent of X% of trade costs. It is in principle possible to obtain AVEs of the level of restrictions but those estimates are likely to be biased because it is impossible to comprehensively control for all other country level attributes that affect trade.

4.3 Estimated ad valorem equivalent (AVEs) trade cost changes for two alternative counterfactual policy reform scenarios

On the basis of the approach explained previously, we estimated *ad valorem equivalent* (AVEs) trade cost changes for two alternative counterfactual policy reform scenarios. The AVE estimates are based upon newly constructed STRI scores covering the 27 economies surveyed in this paper.

The two policy reform scenarios used are the following:

> Policy experiment #1: all economies reduce their STRI to the **minimum STRI per sector**. For instance, the AU27 STRIs for transportation are reduced to the minimum transport sector STRI within the sample 27 economies. This implies that, by definition, there is no change in STRI—and hence in trade costs—for the one economy with the lowest STRI in a given sector; thus, there is always one nil (zero) bar in Figure 13.
>
> Policy experiment #2: all economies reduce their sectoral STRI **uniformly by 25 index points**. Moments of the sector-specific STRI distribution are shown in the table 5, which provides a perspective of how much 25 index points are. For the most open economies, this experiment de facto entails driving their STRI to zero, which is equivalent to removing restrictiveness altogether and, by definition, results in an AVE trade cost reduction in percentage terms of 100%. This can be seen in -100% bars in Figure 14.

Table 5 Sector-specific STRI distribution

Group	Sector	Min	First quartile	Median	Third quartile	Max
AU-27	Transport	16.1	39.5	47.6	53.1	67.4
	Insurance/Pension	24.2	45.3	50.5	56.4	80.3
	Telecoms	16.2	32.6	44.5	53.3	72.5
	Other business	24.8	53.6	62.4	71.1	94.4

Within each of the two policy scenarios, AVEs are shown for four services sectors: 1) transportation services; 2) insurance and pension services; 3) telecommunications, computer and information services; and 4) other business services. Across these four sectors, the AVE point estimates are generally significant, as the graphs in Section 3 below with confidence intervals show.

The AVEs were constructed on the basis of gravity estimations with bilateral cross-border trade statistics on these four services sectors and STRI scores for the 68 economies that were published in the 2016-19 update of the STPD (Borchert et al., 2020 and 2021). As such, the AVEs are 'out-of-sample' applications of those estimated gravity coefficients. Overall STRI scores were used encompassing all modes of supply. Solely from a data point of view, we are able to estimate services trade gravity equations for five sectors, i.e., including financial services; however, the estimated coefficient that would be relevant for AVE construction in financial services turns out to be insignificant (i.e., not statistically different from zero). As a result, AVEs are not constructed for financial services because, as Figure 15 shows, all these AVEs are essentially zero. This is a direct implication of the insignificant coefficient obtained.

We would like at this stage to make two points concerning, first, the interpretation of AVE estimates; and, second, the comparison of results arising from the two policy experiments. On the interpretation of AVE estimates; by way of definition, we construct the ad-valorem equivalent trade cost changes as reflecting the percentage change in iceberg trade costs that is associated with a given change in a non-tariff measure (NTM)—here the STRI—that affects international trade in services. The two counterfactual policy reform scenarios outlined above both involve an **easing of services trade restrictions**, i.e., a **decrease** in a country's STRI score. Associated with this decrease in policy restrictiveness, we would expect trade costs to fall accordingly. Indeed, the AVEs represent these falling trade costs expressed in percentage terms. This is why all AVE estimates are negative numbers. For instance, referring to Algeria (DZA) in Figure 13 below, the counterfactual act of setting Algeria's transport service STRI to the sector/group minimum is equivalent to a **decrease** in iceberg trade costs for transport services of -93.3 percent.

As to the comparison of the results, although both policy experiments involve a hypothetical decrease in policy restrictiveness, they yield results that are roughly orthogonal to each other in terms of the resultant country ordering (Figure 15); or to put it differently, the order of ad-valorem gains across countries is more or less reversed. This is not surprising and does not indicate any inherent flaw, but rather reflects the fact that the two experiments imply different **relative** changes in STRI **in percentage terms**. To see this, notice that in the first experiment, the country with the highest STRI by definition exhibits the largest gap to the lowest STRI and, therefore, is going to experience the largest percentage change in its policy restrictiveness. By contrast, the second experiment involves a fixed decrease by 25 index points, which implies a larger percentage change for more open countries. For example, lowering an STRI score of 25 by 25 points is tantamount to a 100% fall, whereas shaving 25 points off an STRI of 75 implies a change of only 33%. Figures 13 and 14 depict the results of the first and second policy experiments, respectively, for the four sectors considered.

Figure 13 AVE trade cost estimates: first policy experiment

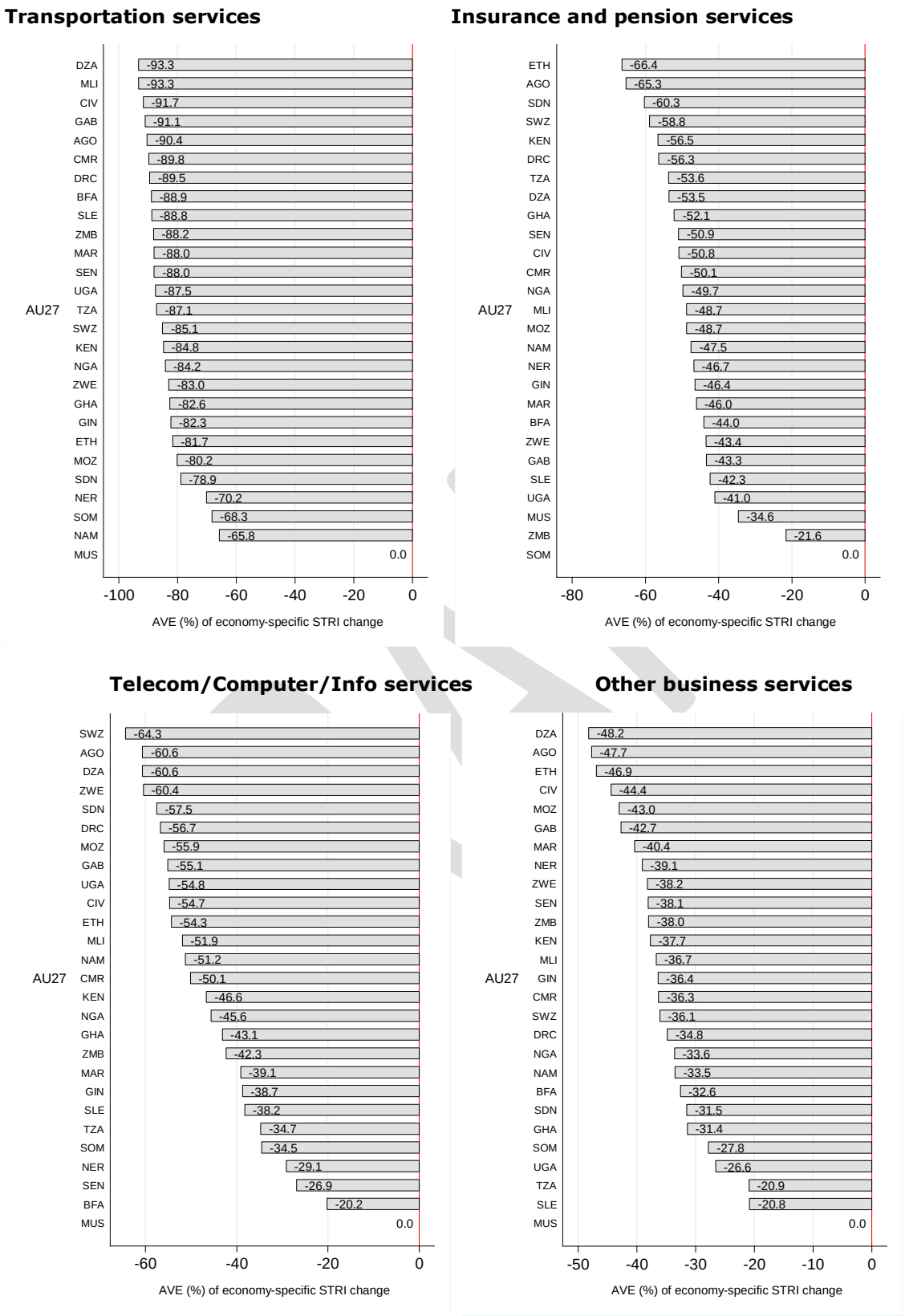
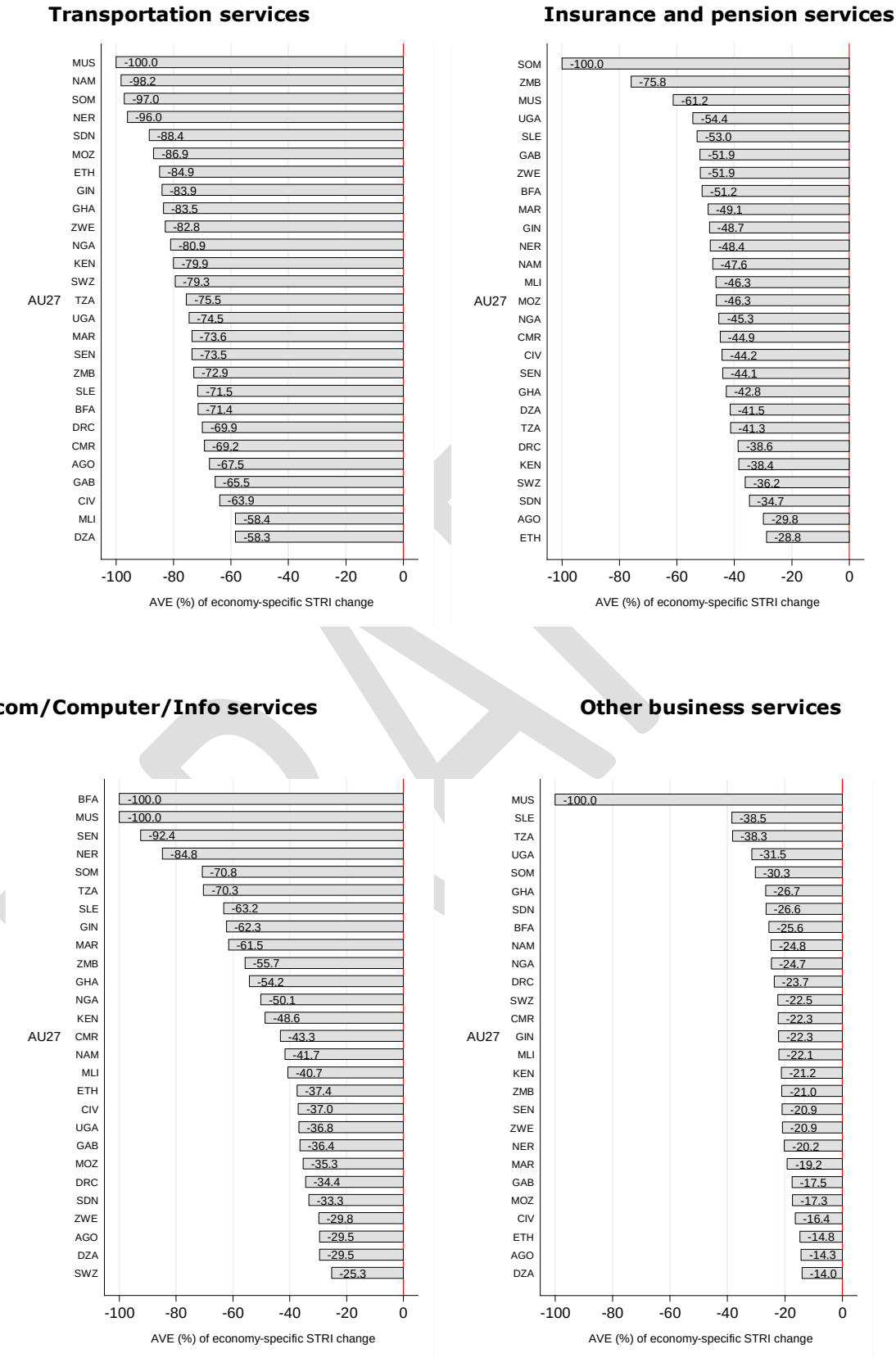


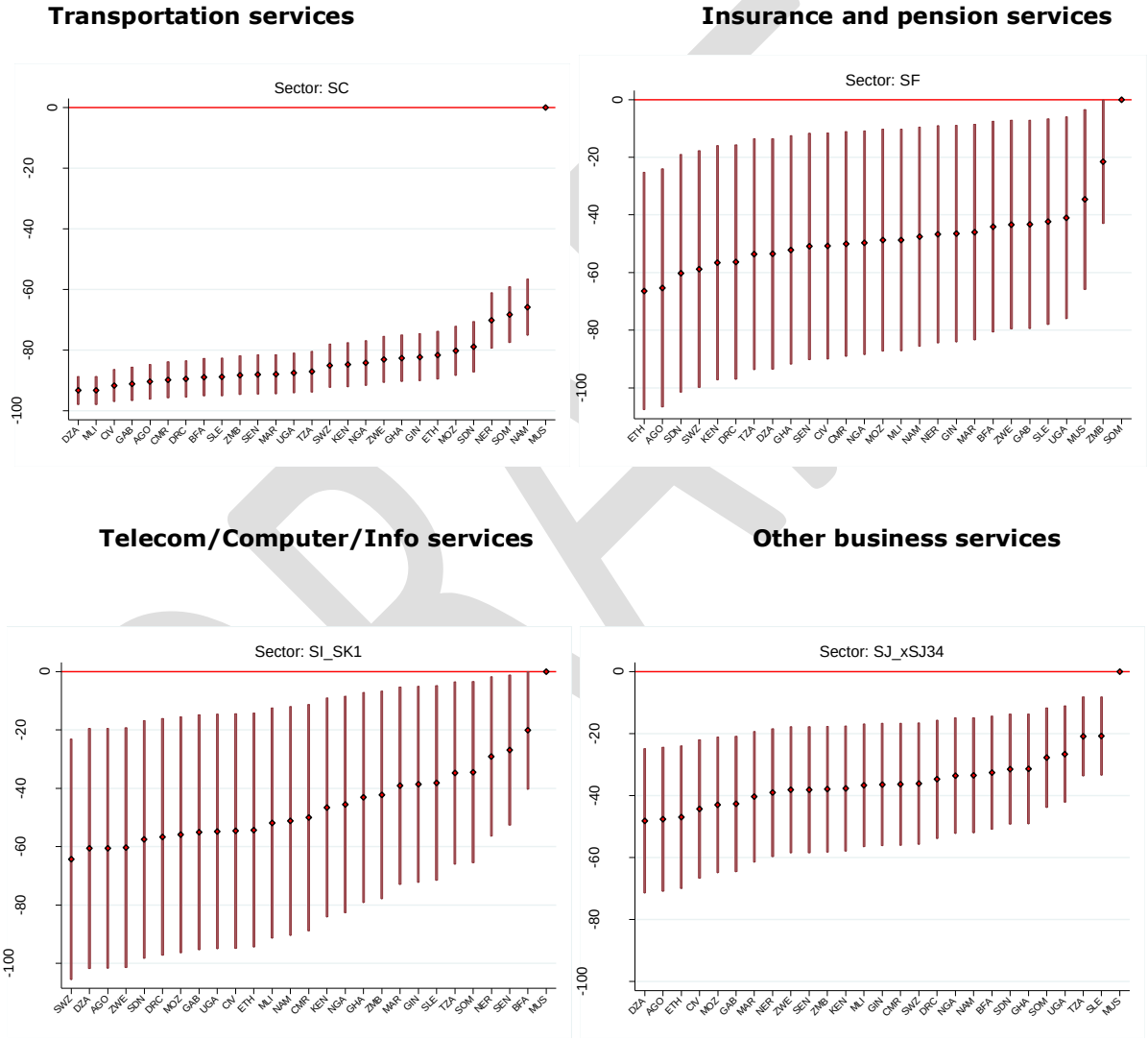
Figure 14 AVE trade cost estimates: second policy experiment



We would like to refer at this stage to the confidence intervals around the AVE point estimates. Like any other econometrically estimated coefficient, the AVE estimates

represent point estimates that have associated standard errors, which reflect the precisions with which these point estimates have been obtained. Figure 15 shows the point estimates from the first policy experiment in the context of their 95% confidence intervals, which are depicted as red bars. Whenever the range of these red bars includes zero (i.e., the bar crosses the red horizontal line at zero), we cannot reject the possibility that the true value of the AVE is actually not different from zero. Therefore, notice that to the right-hand side of each country group there is one economy for which the AVE point estimate is zero, because that country exhibits the sector's minimal services trade restrictiveness. Hence, these rightmost points obtain by construction.

Figure 15. Confidence intervals around AVE point estimates



5 CONCLUSION

Even as international trade in services has grown in importance, the systematic analysis of services trade policy has been inhibited by the dearth of internationally comparable data over time. Paucity of data is particularly acute in the case of less advanced economies. By expanding their Services Trade Policy Database (STPD) to cover all African economies and additional service sectors, the World Bank and the WTO are significantly contributing to

filling this gap. For the first time, comparable information on regulations and policies affecting trade in a broad array of services sectors for over 50 African economies will become available – information that could not only allow these governments to conduct informed negotiations on services in the context of the AfCFTA but that could also be used to conduct research in the context of policy reforms.

That policy information – already available for 27 African economies – has been quantified on the basis of the current WB-WTO Services Trade Restrictions Index (STRI). As explained in the paper, a key feature of this STRI is the aggregation of different applied policy measures on the basis of a Constant Elasticity of Substitution (CES) functional form, which offers a parsimonious, flexible and transparent way of calibrating the marginal contribution to restrictiveness of an additional trade policy measure.

The availability of these data, and of additional data when the STPD is expanded to cover more economies and sectors, allows for further research on the effect of trade policy on services trade flows. Three specific strands of research are pursued in a companion (forthcoming) paper (Borchert et al, 2020). Firstly, the availability of separate STRI scores by mode of supply offers the opportunity of exploring "cross-modal effects". Specifically, we set up a gravity model of bilateral cross-border services trade flows with a view to (i) evaluating the general effect of policy restrictiveness across the different services sectors, and (ii) tracing this overall effect down to its root cause in terms of restrictiveness by mode of supply.

The quantification of services trade policies in these 27 economies has allowed for a first approximation to the pattern of their trade policies – analysis that will need to be pursued in more detail once the information for the remaining African economies becomes available in the coming months. However, the main contribution of this paper lies elsewhere – in the illustration of how the STRI may be used for policy simulation. Indeed, the STRI scores are used to construct ad-valorem equivalents (AVEs), reflecting the percentage change in iceberg trade costs associated with a given change in a non-tariff measure affecting services trade. These AVEs can be used to either quantify the impact on variable trade costs, in ad valorem terms, of observed changes in policies between two points in time, or to simulate policy changes with a view to assessing the impact of counterfactual changes on overall policy restrictiveness and hence on trade costs.

ANNEX 1: LIST OF 27 AU ECONOMIES COVERED IN THIS PAPER

Economy.

Algeria
Angola
Burkina Faso
Cameroon
Côte d'Ivoire
Democratic Republic of Congo
Eswatini
Ethiopia
Gabon
Ghana
Guinea
Kenya
Mali
Mauritius
Morocco
Mozambique
Namibia
Niger
Nigeria
Senegal
Sierra Leone
Somalia
Sudan
Tanzania
Uganda
Zambia
Zimbabwe

ANNEX 2: SUMMARY OF THE COVERAGE OF SECTOR AND MODES

Sectors	Subsectors	Mode 1	Mode 3	Mode 4
Financial	Commercial banking (deposit-taking, lending)	X	X	X
	Non-life insurance (incl. MAT)	X	X	X
	Life insurance	X	X	X
	Reinsurance	X	X	X
Telecom	Telecom fixed (international and local)		X	X
	Telecom mobile		X	X
	Internet		X	X
Distribution	Retailing services	X	X	X
	Wholesale services	X	X	X
Transportation	Air passenger domestic and international		X	X
	Air freight domestic and international		X	X
	Maritime shipping international	X	X	X
	Maritime auxiliary (intermediation, other services)	X	X	X
	Road freight domestic and international	X	X	X
	Rail freight domestic and international	X	X	X
Professional	Accounting	X	X	X
	Auditing	X	X	X
	Legal advice domestic law[16]		X	X
	Legal representation on domestic law[11]		X	X
	Legal advice foreign law	X	X	X

Mode 1 content (apply to some sectors):

i. Form of entry
ii. Licensing/registration
iii. Operations

Mode 3 content (apply to all sectors)

i. Form of entry
ii. Quantitative limits
iii. Licensing/registration
iv. Operations

Mode 4 content (apply mainly to all sectors for generic questions)[17]

i. Form of entry
ii. Quantitative limits
iii. Licensing/qualification (apply only to professional services)
iv. Operations

[16] Cross border legal advice/representation on domestic law is not covered, as it is unlikely/technically infeasible to provide the services via this mode.

[17] Some generic questions on mode 4 are raised for consistency reasons across all sectors covered by this survey. In principle they will trigger the same responses. Such relevant restrictions may not be part of sector-specific legislation/regulation. However, even if regulation (e.gimmigration legislation) is of a general nature, insofar as it applies to the sector, information was reported accordingly. More detailed questions on mode 4 are included for professional services (licensing, qualifications)

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