

Enhancing Intra-African Trade Through Digitalization

From a Regulatory Perspective

Abstract

Digitalization is increasingly changing the way exchanges are taking place across the globe. In recognition of these dynamics, African Union (AU) members States have adopted a specific protocol on digital trade under the African Continental Free Trade Area (AfCFTA) Agreement. The implementation of the Agreement is seen as a game changer for Africa's transformation and development, and digital trade will certainly have a key role to play for the success of the AfCFTA reform.

Against this background, this paper aims at empirically assessing the impact of existing digital trade-related regulations within and between African countries on the volume of intra-African trade of ICT goods and digitally enabled services or put simply intra-African digital trade. It further provides recommendations for African member States in terms of priority actions that they could consider for improving Africa's current regulatory environment surrounding digital trade and with a view to enhance intra-African digital trade.

The analysis is based on data from the recently built ECA-ECLAC-ESCAP Regional Digital Trade Integration Index (RDTII) and covering all the 54 African countries. It builds on an earlier ECA (2023) study which focused on RDTII data compiled for only 28 African countries at the time.

Through gravity modeling, the analysis shows that the intensity level of restrictiveness of regulations undermines relatively more intra-African digital trade than just the number of restrictive regulatory measures. Findings further identify eight priority areas, starting with public procurement, domestic data protection and privacy, and technical standards and procedures, as top priorities and for which improving the regulatory environment could help substantially enhance intra-African digital trade. Continental-wide harmonization of digital trade-related regulations in the area of cross-border data policies is also identified as a crucial

step toward boosting intra-African digital trade. Finally, putting the results from the empirical analysis—combined with the rich data from the RDTII— in parallel with the provisions of the AfCFTA digital trade protocol, several specific priority actions are proposed for consideration by the member States, with the objective to enhance the likelihood and effectiveness of the implementation of the protocol to enhance intra-African digital trade.

Key Words: Digital trade, Regional Integration, AfCFTA.

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Disclaimer

This paper does not reflect the positions or opinions of the ECA.

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1. Introduction

The development of information and communication technologies has positioned the Internet as one of the main platforms for trade (Lee-Makiyama, 2018). This shift has led to a new era, characterized by transactions that can be conducted online for both physical and digital goods and services, involving various actors, including consumers, businesses, and governments. The digitalization of trade presents unique challenges and opportunities, particularly as it amplifies the scale, diversity, and speed of commercial exchanges, while also being subject to potentially burdensome domestic regulations that may hinder its efficiency (Ferracane et al., 2018).

In recognition of these dynamics, African Union (AU) members States have adopted a protocol on digital trade under the African Continental Free Trade Area (AfCFTA)¹ Agreement. Among others, the digital trade protocol aims at favoring a convergence between national regulations governing cross-border exchanges of tradable items, enabled by digital technologies, in Africa.

Successful implementation of the AfCFTA protocol on digital trade requires that the member States have a clear understanding of the gaps in the complex and fragmented digital regulatory environment across the African continent, and the magnitude of the efforts required to close them. It is therefore essential to get a sense of the impact of existing digital trade-related regulations within and between African countries on the volume of intra-African trade of ICT goods and digitally enabled services, here referred to as intra-African digital trade to better identify and address priority actions which member States could undertake in the context of AfCFTA implementation.

Several analyses from the literature already provide useful insights. For instance, the Organisation for Economic Co-operation and Development (OECD) assessed the combined impact of trade agreements and digital connectivity on trade. The study indicates that digital connectivity, when coupled with a Regional Trade Agreement (RTA), can enhance trade between participating countries by approximately 2.5% compared to a situation without RTA (González & Ferencz, 2018). Another empirical research by Suh & Roh (2023), estimates that including digital trade provisions or chapters in trade agreements can significantly boost digital trade, with assessed increases ranging between 33% and 61%, depending on the econometric approach used².

If the above mentioned studies suggest that having and implementing the protocol on digital trade under the AfCFTA agreement could be expected to stimulate digital trade of African countries, they either fail to take into account the restrictive nature of the rules governing digital connectivity (González & Ferencz, 2018) or do not specifically focus on Africa (González & Ferencz, 2018; Suh & Roh, 2023). Caution is therefore required about extending such findings to the African context.

Between 2021 and 2024, the United Nations Economic Commission for Africa (ECA), through its African Trade Policy Centre (ATPC), has collected and compiled national-level data on digital trade regulations

¹ The Agreement establishing the AfCFTA was signed in March 2018 and entered into force in May 2019. The official start of trading under the Agreement was 1 January 2021 but trading effectively only started in October 2022, following the launch of the AfCFTA Secretariat's Guided Trade Initiative.

² Suh and Roh use three different specifications. These include the use of individual fixed effects, the use of a remoteness indicator as a replacement for fixed effects, and the inclusion of trade agreement lead-variables to control for reverse causality.

from all the 54 African countries. Working closely with the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), and the European University Institute (EUI), a global index (managed by EUI) and a regional index (jointly managed by ECA, ECLAC and ESCAP) combining collected and consistent information by ECA (for Africa), ECLAC (for Latin America and the Caribbean), ESCAP (for Asia-Pacific), and EUI (for multiple countries from the rest of the world) were built to assess the multiple current regulatory environments within and between the different countries and main world regions. In the indexes, those regulatory environments are assessed against twelve key identified pillars of digital integration (see Box 1). All the rich information contained in the Regional Digital Trade Integration Index (RDTII) has been made freely and publicly available by ECA, ECLAC and ESCAP on a dedicated platform ([DTRI Initiative \(uneca.org\)](https://uneca.org)), along with other digital trade-related collected data and produced information to facilitate policy decision and policy analysis in the area of digital trade in Africa, Latin America and the Caribbean, and Asia-Pacific.

Building on the information contained in the RDTII, this study empirically assesses, through gravity modeling and focusing on all the 54 African countries, the impact of digital trade-related regulations on intra-African trade of ICT goods and digitally enabled services. Findings from the analysis help narrow down on those measures that are found to have the strongest impact on intra-African digital trade, thereby requiring special and urgent attention, including for harmonization across the continent, as member States implement the AfCFTA reform with the goal to boost intra-African trade in those ICT goods and digitally enabled services. It also provides an update and complement results previously obtained through ECA's research entitled "Digital trade regulatory environment: Opportunities for regulatory harmonization in Africa" (ECA, 2023) and focusing on only 28 African countries. Consistent with the earlier ECA research, the results from the present study confirm that the intensity level of restrictiveness of the regulations plays a far greater role in shaping trade outcomes than just the number of restrictive regulatory measures. Both studies emphasize that addressing restrictive regulations in public procurement and domestic data protection and privacy is crucial to unlocking intra-African digital trade and should be top priorities for African policymakers. While the ECA (2023) study identified quantitative trade restrictions, telecom and competition policies as other key priority areas for reforms, findings from this new ECA study, based on all 54 countries, indicate that standards and procedures deserve greater attention. Additionally, harmonizing digital trade-related regulations in the area of cross-border data policies is found to have great potential for enhancing intra-African digital trade.

The rest of the paper is organized as follows: the next section (section 2) provides an overview of the RDTII, with a focus on Africa; section 3 presents the methodology and data used for the analysis; section 4 discusses the key findings; while section 5 concludes and provides a set of policy recommendations.

2. Overview of the Regional Digital Trade Integration Index (RDTII) and implications for Africa

2.1 *The Regional Digital Trade Integration Index in brief*

The ECA-ECLAC-ESCAP RDTII is designed to assess, for each of the three regions (Africa, Latin America and the Caribbean, Asia-Pacific), the extent to which the current regulatory environment of that region (here Africa RDTII global score) or each country within that region (here African countries' individual RDTII scores) impedes regional digital trade integration across identified policy domains and measures. A total of twelve policy domains or "pillars" (see Box 1) have been identified as essential for the integration of countries in their digital trade environment. Each pillar is itself informed by a set of specific practical measures or "indicators" (with a total of 65 measures across the 12 pillars) encountered by digital trade operators on the ground (see appendix 7.1). For instance, detailed information collected in each country for four measures (indicators) namely blocking/filtering, Internet shutdown, online advertising requirements, and licensing requirements inform the extent to which content access (i.e. pillar 9) may be limited in that country, and as compared to that of other countries in the region.

The composite RDTII score is obtained following a two-steps approach. First, for a region or a country, the importance of each indicator within its relevant pillar is assessed based on the perception of experts in the field who have been consulted. This gives "experts' weights" to the various indicators that are used for the computation of each RDTII pillar score.³ Then, for that same country or region, the twelve pillar scores are aggregated into a single RDTII global score through a simple average. RDTII global and pillars' scores range from 0 to 1, from average low to high compliance cost from a regulatory perspective to undertake digital trade-related business. Full details on the RDTII methodology can be found in ECA-ECLAC-ESCAP (2024a).⁴

Box 1 – The twelve pillars of the Regional Digital Trade Integration Index

Pillar 1 covers **tariffs and trade defence** measures that limit a country's trade in ICT goods within its region (here, Africa).

Pillar 2 covers **restrictions on participation in public procurement** of ICT goods and services.

Pillar 3 covers **restrictions on foreign direct investment** in sectors related to digital trade. Such restrictions may be in place for national security and other legitimate reasons but reduce competition.

Pillar 4 looks at **Intellectual Property Rights (IPRs) policies** and the balance between protecting individual rights to intellectual property and fostering innovation.

Pillar 5 covers policies and regulations regarding **telecommunications infrastructure and competition**.

Pillar 6 considers **cross-border data policies** which may address data privacy, data protection, data flows and other concerns, but also increase the costs of digital trade.

³ The weight assigned to each indicator is determined by experts' assessments of its significance within the respective pillar and are based on Ferracane et al. (2018). Indicators that are perceived by experts to have a stronger influence on digital trade are given greater weight.

⁴ See: [2402 Cover \(uneca.org\)](https://uneca.org).

Pillar 7 covers **domestic data policies** governing the use of data in the regulating economy, such as regulations related to domestic data privacy, protection, retention and cybersecurity, that may enhance trust in digital transactions.

Pillar 8 deals with measures governing **Internet intermediary liability**, balancing the need for holding intermediaries responsible for illegal content over the Internet and not discouraging their participation in digital trade with onerous liability or obligations.

Pillar 9 deals with **content access**, balancing the interest to reduce illegal online content and the business costs for the intermediaries to conform with the requirements and the interruption to providing their services.

Pillar 10 captures **non-technical measures (NTMs)**, including trade restrictions that are non-tariff measures (e.g., quotas) that limit a country's ICT goods and online services' importations to and exportations of from within its region (here, Africa).

Pillar 11 focuses on **standard and related procedures**. This pillar considers procedural delays and complexity, which deviate from internationally recognized best practices, as a potential trade restriction for ICT goods and online services in the telecommunication sector.

Pillar 12 captures a broad spectrum of policies that affect **online sales and transactions**, including regulations on online purchase, delivery, online payment and domain names as well as legal recognition for electronic signatures and the existence of relevant consumer protection laws.

Source: ECA-ECLAC-ESCAP (2024a). Regional Digital Trade Integration Index 2.0: A Guide.

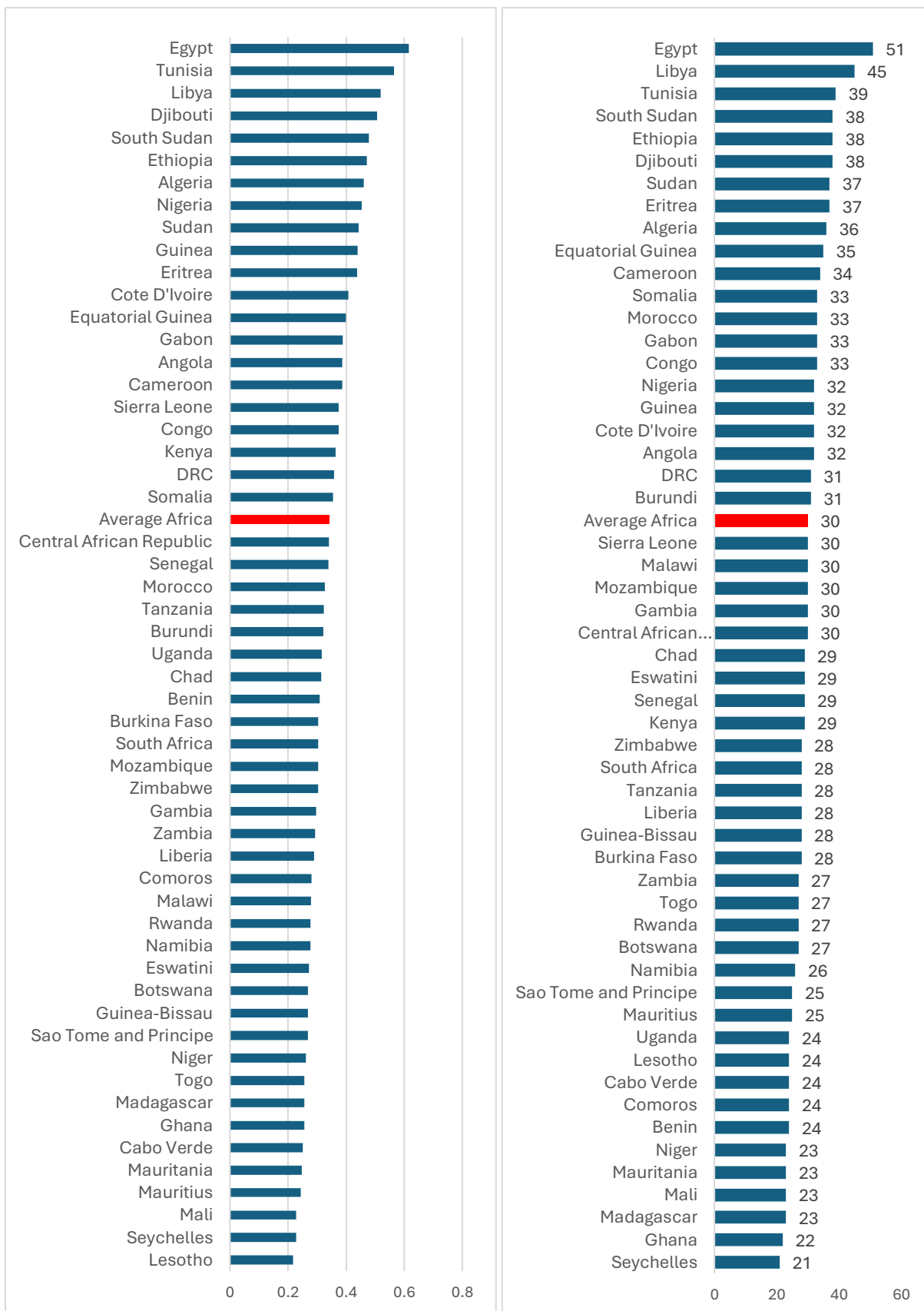
2.2 Key stylized facts and figures from RDTII for Africa

While other facets of the digital landscape, such as building and maintaining adequate infrastructure, demand significant and costly investments, the area of regulations is perceived as requiring relatively lower levels of expenditure (Gallegos et al., 2020). Africa's average RDTII score of 0.34 does attest to a moderate compliance cost in terms of regulations required for business to undertake digital trade on the continent. While this may seem promising, especially if improving further the regulatory environment for digital trade on the continent could be assessed to help substantially improve intra-African digital trade, there are marked disparities across African countries.

Figure 1 below shows the ranking of African countries based on their individual RDTII scores, on the one hand, and on the numbers of regulatory measures supposed to be restrictive for digital trade, on the other hand. The latter constitutes a second metric of RDTII and allows to have a look at digital trade-related regulations that is different from the compliance cost or intensity level of restrictiveness of the regulations. For example, although Morocco's average compliance cost is below the continental average, the country has a higher-than-average number of restrictive regulatory measures to digital trade. Twenty-one countries have either individual RDTII scores or number of restrictive regulatory measures above the respective African average, with Egypt, Tunisia, and Libya, being in the top three African countries in terms of both highest compliance cost and largest number restrictive regulatory measures. On the opposite side of the spectrum, Lesotho, the Seychelles and Mali have the lowest compliance cost, while the Seychelles, Ghana and Madagascar stand out for having the fewest

restrictive regulatory measures. With Egypt's overall RDTII score (0.62) being nearly three times that of Lesotho (0.22), massively harmonizing national regulations across the continent wouldn't be an easy task.

Figure 1: RDTII scores (left-hand panel) and number of restrictive regulatory measures (right-hand panel), by African country, in 2024

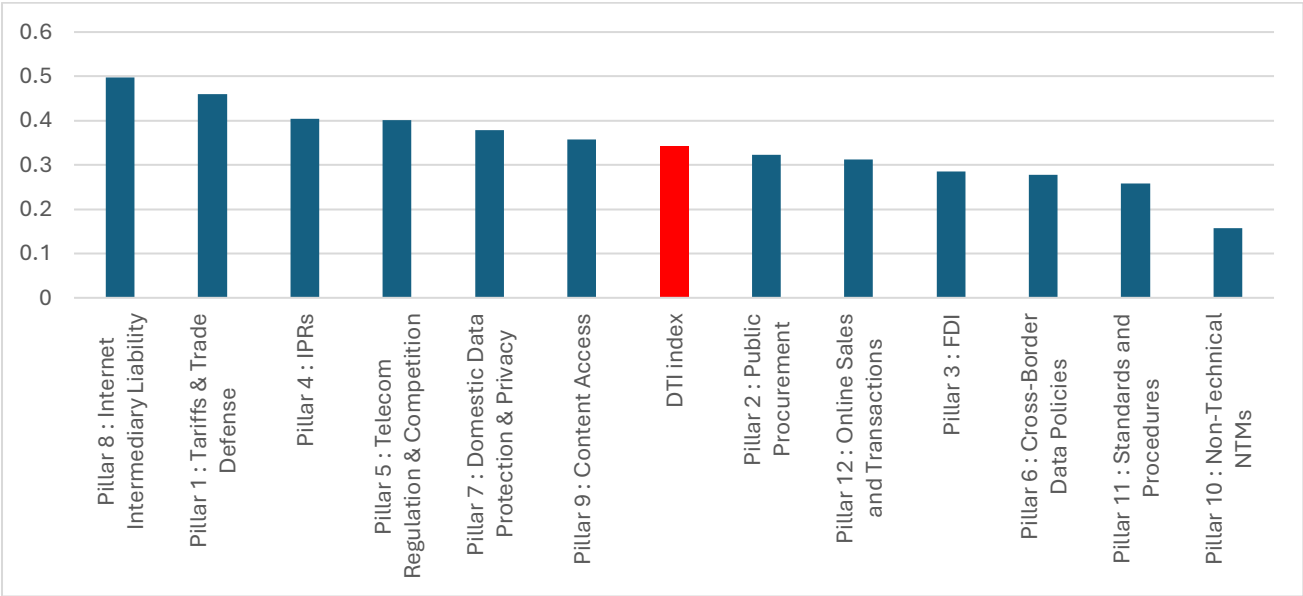


Source: Authors' calculations based on ECA-ECLAC-ESCAP RDTII data

The important disparities observed at country-level are also detected across the twelve pillars of the RDTII, with average RDTII scores for Africa ranging from only 0.16 for pillar 10 on quantitative trade

restrictions (indicative of relatively lower compliance costs required) to 0.50 for pillar 8 on intermediary liability (indicative or relatively higher compliance costs required) (see Figure 2).

Figure 2: Average RDTII scores, by pillar, 2024



Source: Authors’ calculations based on ECA-ECLAC-ESCAP RDTII data; Notes : see the box 1 and appendix 7.1 for full details on the pillars

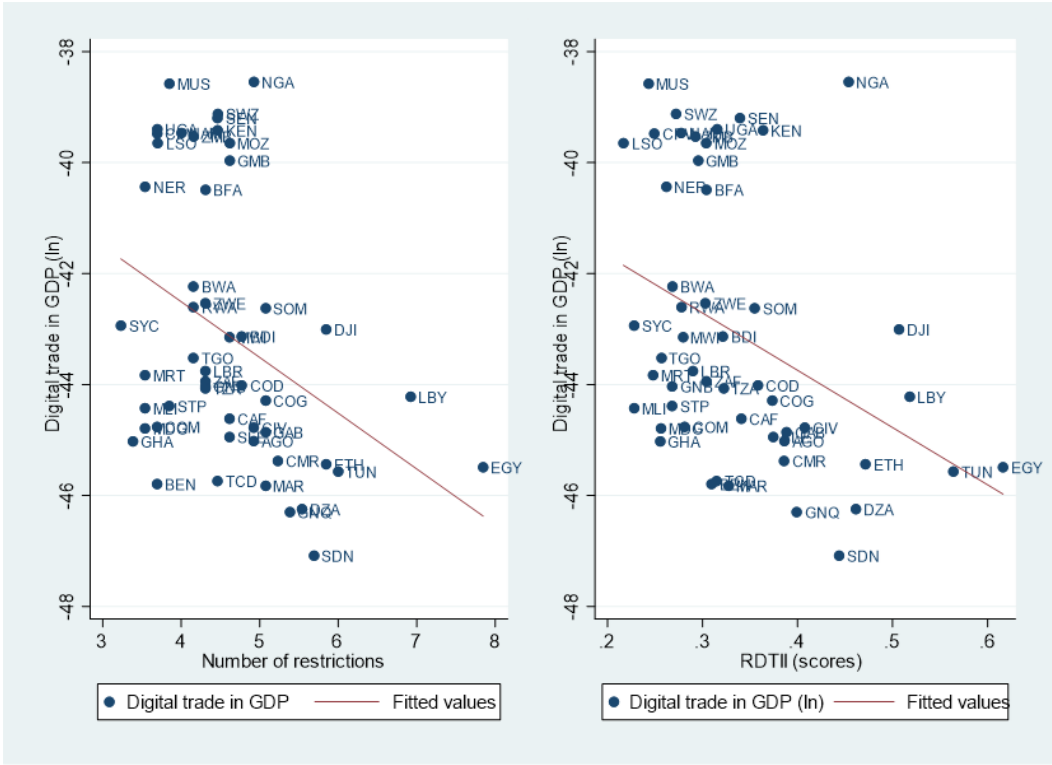
Notwithstanding, average RDTII scores at country or pillar level are not sufficient to identify where the most pressing issues to be addressed for African countries may be. Indeed, digging deeper within each country and pillar is required to precisely understand where actions may be necessary to lower the compliance costs in terms of regulations for businesses to undertake digital trade-related activities in Africa. An in-depth analysis of the RDTII across countries and pillars is provided in ECA-ECLAC-ESCAP (2024b).⁵ Having said that, beyond knowing how conducive the regulatory environment may be or not for digital trade in Africa, it is essential to understand how much the various measures within Africa’s regulatory landscape undermine intra-African digital trade. Of course, one would expect that an environment with relatively lower compliance costs for businesses to operate will be associated with higher levels of digital trade. However, this is not necessarily guaranteed. Indeed, it is possible that a country may have digital trade regulations leading to relatively high compliance costs but that those regulations may not substantially limit digital trade. On the contrary, a country may have digital trade regulations associated with relatively lower compliance costs that could in fact impede digital trade in Africa relatively more. The purpose of this paper is precisely to bring clarity on that matter through empirically assessing the relationship between digital trade regulations and intra-African trade itself.

But before delving into the analysis, a simple graphical representation exploring to what extent intra-African trade in ICT goods relates to digital trade regulations, as approximated by the RDTII, can already provide useful insights. Given that GDP variables are known to enter the gravity equation with coefficients close to one (Head & Mayer, 2014), and thus for coherence with the econometric estimations undertaken (where GDPs are controlled for) and to be presented in the next two sections, digital trade is expressed as a percentage of GDP. This is to illustrate how digital trade (as a percentage

⁵⁵ See: [2401 FrontCover \(uneca.org\)](https://uneca.org).

of GDP) varies with both the intensity (right-hand panel) and the number (left-hand panel) of restrictive regulatory measures. Overall, the graph reveals a strong negative correlation between either the RDTII scores or number of restrictive regulatory measures and the total exports of ICT goods within Africa, suggesting that higher compliance costs or higher number of restrictive regulatory measures are associated with lower trade volumes.

Figure 3: Correlation between Digital trade and the number of restrictive regulatory measures (left-hand panel) vs. RDTII scores for African countries



Source: Authors’ calculations based on ECA-ECLAC-ESCAP RDTII data and ITPD-E data.

Nonetheless, some countries deviate from this global trend. Notably, Nigeria and Kenya are among the leading intra-African exporters of ICT goods, while having relatively high compliance costs and high numbers of restrictive regulatory measures. The gravity modeling which incorporates other potential driving factors which are not captured in the above graphs, such as language and distance, will certainly help refining the observed results and draw more robust conclusion on the relationship between digital trade regulatory restrictions and the trade of digital goods as well as services within the continent.

3. Methodology and data used for the analysis

3.1 Econometric issue and specification

An econometric analysis through gravity modeling is undertaken to empirically assess the relationship between digital trade regulations (through the intensity and/or number of restrictions in the

regulations) and the level of intra-continental trade in ICT goods and digitally enabled services. Precisely, a reduced form of the gravity equation is determined as follows:

$$Tr_{ij}^s = \beta \sum Z_{ij} + \theta TA_{ij} + f_i + f_j + \alpha RDTII_i * EXT_{ij} + \gamma EXT_{ij} + \varepsilon_{ij}$$

Where Tr_{ij}^s is total digital trade flow between exporter country i and importer country j in sector s .

Following the literature on gravity modeling, it is assumed that bilateral trade between two partners is determined by bilateral trade policies as well as geographical and cultural factors, all reflecting the bilateral trade costs between them (Baier & Bergstrand, 2009; Head & Mayer, 2014). Therefore, a set of bilateral variables ($\sum Z_{ij}$), including distance, colonial ties, common borders, languages and legal architecture between partners is introduced in the equation.

The variable TA_{ij} accounts for existing trade agreements between trading partners. The trade-creating effects of such agreements have been well-established in the literature, from Viner's seminal work (Viner, 1950) to more recent studies on international trade (Anderson & Yotov, 2016; Baier et al., 2019; Bergstrand et al., 2015; Nagengast & Yotov, 2023). A classic challenge in trade econometrics is to ensure the credibility of estimates by controlling for confounding factors, particularly with respect to the variable of interest that represents the intensity level of restrictiveness of the regulations or number of restrictive regulatory measures expressed using the scores or data from the regional digital trade integration index ($RDTII_i$). Introducing existing trade agreements, consequently, mitigates the bias of omitted and confounding variables.

The terms f_i and f_j are country-specific effects (fixed effects) approximating the importing and exporting capacities, also known as multilateral resistances (Anderson & Van Wincoop, 2003). These fixed effects are increasingly incorporated into gravity models to control for country-specific observable and unobservable variables. However, the use of fixed effects introduces certain limitations, as they control for and thus preclude the concurrent estimation of other country-specific variables such as GDP or population.

This limitation extends to our variable of interest, $RDTII_i$, which measures the extent to which the regulatory environment may facilitate or hinder digital trade integration between African countries. As mentioned in the previous section, the index score ranges from 0 to 1, with the latter indicating a high compliance cost or fully restrictive regulatory environment. As an alternative to the RDTII score, we also consider the number of restrictive regulatory measures.

To overcome the aforementioned limitations, induced by the use of fixed effects, we introduce EXT_{ij} into the specification. EXT_{ij} variable dissociates external trade from domestic (intra-national) trade flows. The use of domestic trade flow allows to estimate non-discriminatory trade policies in presence of exporters and importers fixed effects (Heid et al., 2021). Practically, the variable takes a value of 1 for external trade flows and 0 for domestic flows. The rationale behind is to capture the relative decline in bilateral costs in external trade as compared to intra-national trade, thereby ensuring that trade agreements and $RDTII_i$ only reflect policy-driven trade liberalizations without accounting for other factors influencing trade costs (Bergstrand et al., 2015). Additionally, to emphasize that the RDTII measures domestic policies applicable to cross-border exchanges of digital goods the $RDTII_i$ variable is interacted with the $Intl_{ij}$ variable (Heid et al., 2021).

3.2 Data

Trade flows, trade agreements, distance, colonial ties, common borders, languages, and legal architecture are derived from the USITC's International Trade and Production Database for Estimation (ITPD-E).⁶ The primary advantage of the ITPD-E is that it offers a comprehensive coverage of both external and domestic trade data at the sectoral level, encompassing agriculture, mining, energy, manufacturing, and services. Constructed using reported administrative data and deliberately excluding information estimated by statistical techniques, the ITPD-E is particularly well-suited for the estimation of economic models, such as the gravity model of trade (Borchert et al., 2022, 2021). Moreover, the ITPD-E provides complete coverage of all African countries allowing to properly capture intra-African trade. The analysis is limited to a single year due to the dimension of RDTII which accounts for the current situation, ensuring that our estimates are grounded in reliable and consistent data sources, although it inevitably reduces the sample size.

4. Key findings from the analysis

4.1 To what extent do digital trade-related regulations matter for intra-African digital trade?

Table 1 presents the empirical results⁷ linking total ICT trade value in goods and digitally enabled services with the number of restrictive regulatory measures in the RDTII (column 2), on the one hand, and with the RDTII score or compliance cost or intensity level of restrictiveness of the regulations on the other hand (column 3). As expected, countries are more likely to trade with partners in closer proximity, and sharing a common language significantly enhances ICT trade among African nations. However, membership in the WTO (which goes beyond intra-African integration) or a shared colonial history does not appear to influence ICT trade in goods and digitally enabled services within Africa.

Table 1: Gravity results using either the number of restrictions or RDTII score

Variables	Number of restrictive measures	RDTII score [0-1]
Distance	-1.005*** (0.000)	-1.028*** (0.000)
Colony	1.411 (0.194)	0.855 (0.412)
Legal architecture	-0.131 (0.790)	-0.071 (0.881)
Common language	2.257*** (0.000)	2.233*** (0.000)
WTO	4.538 (0.223)	4.179 (0.154)

⁶ ITPD-E data can be retrieved from : <https://www.usitc.gov/data/gravity/itpde.htm>

⁷ Note that our results are based on the Poisson Pseudo-Maximum Likelihood (PPML) method which is well established in the literature as it presents the advantages of dealing with heteroskedasticity and zero trade values in the dependent variable (Santos Silva and Tenreyro, 2006).

<i>Intl</i>	0.195 (0.940)	0.750 (0.624)
RDTII*EXT	-0.247*** (0.007)	-21.543*** (0.000)
Observations	2159.000	2159.000
R2	1.000	1.000

Source: Authors' calculation based on gravity modeling; Note: *, **, *** denote significance at the 10, 5 and 1 percent level, respectively. Robust clustered standard errors are reported under each coefficient. Every estimation has been done with importer and exporter fixed effects

More importantly, results suggest (RDTII*Intl; Table 1, column 1) that **the intensity level of the restrictiveness of regulations** (RDTII score; Table 1, column 3) **matters significantly more than just the number of the restrictive regulatory measures** (number of restrictive measures; Table 1, column 2) **in shaping trade outcomes**.⁸ This implies that in the context of trade liberalization, reducing the intensity level of restrictive measures is likely to have a more substantial impact on ICT trade volumes than simply decreasing the number of restrictive measures. Such findings is aligned with older results from ECA (2023) which focus was only on 28 African countries, whereas the present analysis covers the entire African continent.

Precisely, a 1% reduction in the RDTII score (equivalent to a 0.01 reduction on a scale of 1) is expected to boost intra-African digital trade by 21.5% (or USD 508 million).⁹ In contrast, a 1% reduction in the number of restrictive regulatory measures is projected to increase intra-African digital trade by only 0.25% (or USD 6 million). Table 2 provides a summary in terms of how such expected impact would translate in increases of absolute intra-African digital trade at country-level. For instance, in countries like Egypt, Tunisia, and Libya, that are among the top three African countries with both the highest RDTII scores and the largest number of restrictive regulatory measures (see Figure 1), a 1% reduction in the RDTII score could generate absolute increases in their exports of ICT goods and digitally enabled services to African partners of USD 388 thousands, USD 3,978 thousands, and USD 287 thousands, respectively. In the same vein, a 1% reduction in the number of regulatory measures would increase Egypt, Tunisia and Libya's digital exports with their African partners by about USD 5 thousands, USD 46 thousands, and USD 3 thousands, respectively. It should however be noted that such figures should be interpreted with caution as the results are based on cross-sectional data, thereby limiting the ability to assess persistence over time.¹⁰ Furthermore, the use of restricted set of fixed effects prevents from drawing causal conclusions.

Table 2: Expected impact on African countries' exports of ICT goods and digitally enabled services to African partners of reducing either RDTII score or the number of restrictive regulatory measures by 1%, USD thousands

Country	Numbers of restrictive measures	RDTII score
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⁸ Given the cross-sectional nature of data which implies a limit to the controls we can use, we recommend not to interpret coefficient as robust elasticities or marginal effects.

⁹ See information from row "RDTII*EXT" under Table 1 and from "AFRICA TOTAL" under Table 2.

¹⁰ Meaning that the methodology used focuses on a single year, not allowing to capture any potential change over time.

Angola	3.6	312.6
Burundi	0.2	19.5
Benin	1.6	134.1
Burkina Faso	1.0	82.9
Botswana	10.5	903.2
Central African Republic	0.3	22.4
Cote d'Ivoire	18.1	1,556.0
Cameroon	2.4	208.0
DRC	1.9	159.6
Congo	1.5	128.4
Comoros	0.4	37.7
Cabo Verde	0.3	28.2
Djibouti	0.1	5.2
Algeria	0.8	68.3
Egypt	4.5	388.1
Eritrea	3.8	323.2
Ethiopia	28.9	2,489.5
Gabon	0.7	62.7
Ghana	23.3	2,006.6
Guinea	n/a	n/a
Gambia	372.3	32,017.0
Guinea-Bissau	0.0	0.0
Equatorial Guinea	0.8	65.3
Kenya	98.5	8,470.3
Liberia	0.7	64.0
Libya	3.3	287.0
Lesotho	29.8	2,559.7
Morocco	52.4	4,505.6
Madagascar	5.7	487.8
Mali	1.4	117.9
Mozambique	2.5	215.5
Mauritania	3.3	287.7
Mauritius	74.4	6,398.9
Malawi	9.2	792.5
Namibia	36.3	3,124.0
Niger	0.9	74.4
Nigeria	27.9	2,396.3
Rwanda	4.4	381.3
Sudan	1.4	116.1
Senegal	30.9	2,653.3
Sierra Leone	1.3	114.9
Somalia	0.5	44.5
South Sudan	0.0	0.4
Sao Tome and Principe	0.0	2.4
Eswatini	1,879.0	161,590.0
Seychelles	1.2	100.1

Chad	0.7	60.3
Togo	2.2	190.3
Tunisia	46.3	3,978.0
Tanzania	31.3	2,695.6
Uganda	14.0	1,201.8
South Africa	3,010.5	258,902.6
Zambia	52.8	4,540.1
Zimbabwe	3.5	304.9
TOTAL AFRICA	5,903.2	507,676.7

Source: authors based on gravity results. Note: results not displayed for Guinea due to missing data.

4.2 Are there specific policy areas in which digital trade-related regulations matter most for intra-African trade?

Disaggregating the results across the 12 pillars of the RDTII provides further insights on those regulatory measures that matter most for intra-African trade on ICT goods and digitally enabled services.

Technically, the number of restrictive regulatory measures under each pillar of the RDTII, on the one hand, and Africa's RDTII score for each pillar, on the other hand, are regressed with the corresponding intra-African digital trade sectors. The correspondance between pillars and associated trade sectors follows the methodology outlined in ECA (2023),¹¹ with ITPD-E data being supplemented with data from the Balanced Trade in Services Statistics (BaTiS)¹² to enhance the coverage of services for proper matching (see Appendix 7.2 for full details).

Findings indicate that the negative and significant outcomes in terms of the impact of either the intensity level of restrictiveness of the regulations or the number of the restrictive regulatory measures of regulations on intra-African trade, based on global RDTII for Africa (see sub-section 4.1), are not verified across all the 12 pillars of the RDTII (see Appendix 7.3). Three specific categories could be differentiated and indicative that member States should prioritize actions to address regulatory issues in 8 policy areas, based on different levels of effectiveness, as follows (see table 3):

1. High efficacy: Pillars for which addressing either the intensity level of restrictiveness of regulations or the number of the restrictive regulatory measures can positively impact intra-African digital trade.

Under three pillars of the RDTII (i.e. pillars 2, 7, and 11), both the intensity level of restrictiveness of the regulations and the number of restrictive regulatory measures are expected to lead to a reduction of intra-African digital trade (although not always significantly). In other words, **tackling restrictive regulations under those three policy areas, namely public procurement, domestic data protection and privacy, standards and procedures, is expected to unleash intra-African digital trade and should be seen as top priority areas for African countries to act upon.**

¹¹ See correspondence table under Appendix 7.2.

¹² BaTiS is the World Trade Organization and the Organisation for Economic Co-operation and Development databases which provide a balanced matrix of international trade in services

2. Medium efficacy: Pillars for which addressing the intensity level of restrictiveness of regulations (not the number of the restrictive regulatory measures) can positively impact intra-African digital trade.

For pillar 4 on IPRs and pillar 12 on online sales and transactions, the intensity level of restrictiveness of regulations related to digital trade does have a negative impact on intra-African digital trade, when the number of restrictive regulatory measures does not. Consequently, it will be required to tackle those regulations that have high intensity level of restrictiveness under those two pillars to facilitate intra-African digital trade.

3. Medium-low efficacy: Pillars for which addressing the number of the restrictive regulatory measures (not the intensity level of restrictiveness of the regulations) can positively impact intra-African digital trade.

The number of restrictions in telecom regulation and competition (pillar 5), cross-border data policies (pillar 6), and non-technical NTMs (pillar 10) reduces intra-African digital trade, whereas the compliance cost or intensity level of the restrictiveness of the regulations does not. Under those three pillars or policy areas, the most important to stimulate intra-African digital trade will be to address the number of regulatory measures.

Table 3: RDTII pillars with negative and significant impact on intra-African digital trade

High efficacy (pillars displaying a negative and significant relationship between either the intensity level of restrictiveness of regulations or the number of the restrictive regulatory measures and intra-African digital trade)	Medium efficacy (pillars displaying a negative and significant relationship between only the intensity level of restrictiveness of regulations and intra-African digital trade)	Medium-low efficacy (Pillars displaying a negative and significant relationship between only the number of the restrictive regulatory measures and intra-African digital trade)
Pillar 2: Public procurement of ICT goods, products and online services Pillar 7: Domestic data protection and privacy Pillar 11: Technical standards applied to ICT goods, products and online services (standards and procedures)	Pillar 4: Intellectual Property Rights (IPRs) Pillar 12: Online sales and transactions	Pillar 5: Telecom regulation and competition Pillar 6: Cross-border data policies Pillar 10: Quantitative trade restrictions for ICT goods, products and online services (non-technical NTMs)

Source: authors based on gravity results by pillar of the RDTII (see Appendix 7.3).

The suggested level of efficacy here is based on the outcomes from section 4.1, indicating that addressing the intensity level of restrictiveness of regulations tend to be relatively more effective at enhancing intra-African digital trade than that of tackling the number of restrictive regulatory measures. Having said that, any effort to improve the regulatory environment surrounding all the 8 pillars identified under Table 3 remains particularly important to stimulate intra-African digital trade.

4.3 Does it make sense to continentally harmonize digital trade-related regulations to enhance intra-African digital trade?

Sections 4.1 and 4.2 highlighted the negative correlation between intra-African digital trade and the restrictive domestic regulations of importing countries. However, digital trade may also be influenced by the regulatory environments of both trading partners—importers and exporters. Specifically, digital trade patterns between African country pairs may depend on the degree of similarity in their restrictive regulations. To account for the sensitivity of digital trade to the similarity (or heterogeneity) in the level of restrictive domestic policies between country pairs, a similarity index was constructed and regressed on intra-African digital trade. This analysis follows the previously described econometric model (see section 3.1), excluding domestic trade flows, as a similarity index for these flows is not meaningful and does not vary across domestic country pairs. The similarity index was interacted with the RDTII, as per the methodologies outlined in ECA (2023) and Nordås (2016).

The similarity index (see Appendix 7.4 for a detailed description) measures whether country pairs have comparable levels of regulatory restrictiveness for each of the pillars of the RDTII. For each country pair and pillar, the index indicates the extent to which the two countries exhibit similar levels of regulatory restrictiveness (ECA-ECLAC-ESCAP, 2024b; Nordås, 2016). The index ranges from 0 to 1, with values closer to one indicating a greater similarity in regulatory levels for the respective pillars.

The impact of the similarity index on intra-African digital trade in goods and digitally enabled services related to specific pillars could be either positive or negative. This is because a high similarity index may correspond to pairs of countries with either similarly low or similarly high restrictive environments. For example, two pairs of countries might share either high or low levels of restrictions yet display the same similarity score. As a result, the similarity index could theoretically correlate positively or negatively with trade outcomes. To address this ambiguity, the similarity index is further interacted with the RDTII score to examine whether regulatory similarity in digital policies has varying effects depending on the importers country's overall level of digital trade restrictiveness (ECA, 2023; Nordås, 2016).

Results (see Appendix 7.5) indicate that overall, similarity doesn't matter for intra-African digital trade. Indeed, aggregated digital trade is not significantly impacted by whether domestic regulations intensity is similar across African countries pairs (see Appendix 4.5, results for "similarity*RDTII" term under Column ToT,). Nonetheless, there are two exceptions in the case of regulations related to pillar 3 (FDI) and pillar 6 (cross-border data policies), which appear to be critical for intra-African digital trade.

In the case of FDI, the findings a priori suggest that harmonizing regulations governing foreign direct investment in sectors relevant to digital trade can promote trade in ICT goods and digitally enabled services. However, harmonizing these rules, conditional on the importer's domestic level of regulatory restrictiveness, does not have a significant impact on digital trade. This also further supports the findings from section 4.2 on FDI where addressing regulations intensity is not found to have significant impact to promote intra-African digital trade.

Conversely, harmonized rules governing cross-border data policies seem to reduce trade in digitally enabled services. This result is however likely driven by pairs of countries with relatively high RDTII scores. The interaction term does in fact suggest a positive and significant increase of intra-African trade in digitally enabled services. Consequently, aligning the level of restrictions governing cross-

border data policies for importing countries with relatively high RDTII scores to those of exporters with relatively low RDTII scores is expected to have a positive effect on intra-African trade in digitally enabled services. This finding is particularly important as it indicates that **harmonizing digital trade regulations in the area of cross-border data policies across the African continent could significantly enhance intra-African digital trade.**

4.4 What do those results mean in the context of the AfCFTA protocol on Digital trade?

In February 2024, the 37th AU Summit adopted the AfCFTA protocol on digital trade. The protocol aims to further the objectives of the AfCFTA by "establishing harmonized rules, common principles, and standards that enable and support digital trade". The findings presented under sub-sections 4.1, 4.2 and 4.3, along with additional information for RDTII can be useful not only to provide guidance to member States as they implement the AfCFTA protocol on digital trade but also to suggest possible interventions to complement those articulated in the protocol and to ultimately enhance intra-African digital trade.

Indeed, the protocol acknowledges the importance of non-restrictive data governance and urges member States to allow cross-border data transfers and avoid mandating the use of local computing facilities, while still protecting personal data. The findings from sub-section 4.3 clearly shows that harmonizing cross-border data policies across the continent should be seen as a key priority as it is anticipated to significantly boost intra-African trade in digitally enabled services. In the process of harmonizing relevant rules across the continent, African countries will need to carefully consider the number of restrictive rules that they apply domestically, as the mere presence of such rules—regardless of their intensity—can negatively affect intra-African digital trade (see Table 3). When it comes to personal data protection, the findings suggest that both reducing the number of restrictive measures and lessening their intensity are important for harmonization (see Table 3). Furthermore, data from the RDTII identifies as many as 21 African countries lacking a legal framework for data protection, 19 countries with bans on data transfers and requirements for local processing, but only three countries requiring local data storage (see ECA-ECLAC-ESCAP, 2024b). Taking those results and observations into consideration while member State work on the design of the mandated annex on cross-border data transfers under the AfCFTA digital trade protocol would be essential to ensure that the pressing issues are considered, especially in those countries where specific hurdles have been identified, to facilitate intra-African digital trade. Making a reference to the AU Convention on Cyber Security and Personal Data Protection (or Malabo Convention) which adopted, back in 2014, a legal framework for addressing cybercrime and data protection in Africa will be necessary but not sufficient, especially as digital trade is very dynamic and that only 19 countries have signed the Convention and 15 ratified it.¹³

Additionally, technical standards and procedures for ICT goods and digitally enable services are references multiple times throughout the AfCFTA protocol on digital trade, particularly in its Articles 9, 19 and 43, giving them a certain prominence in terms of key policy areas to be addressed. Findings

¹³ As of 19 September 2023; see: [29560-sl-
AFRICAN UNION CONVENTION ON CYBER SECURITY AND PERSONAL DATA PROTECTION 0.pdf
\(au.int\)](#).

from this study confirm the importance to address both the intensity and number of restrictive regulatory measures to standards and procedures for ICT goods and digitally enable services (see expected impact of RDTII pillar 11 on intra-African digital trade; Table 3), as they are assessed to have a significant impact on intra-African digital trade. From RDTII data, standards tend to greatly differ across countries, particularly in product certification, screening, and testing requirements, among others. Therefore, technical standards and procedures cannot be overlooked from the mandated cooperation under Article 43 of the protocol. Redoubling efforts to cooperate across member States on standards and procedures is critical to stimulate intra-African digital trade.

Whereas the findings from this analysis do not empirically support that addressing digital trade-related regulations in the area of FDI could have a significant impact on promoting intra-African digital trade, data from the RDTII indicate that the promotion and facilitation of investment in ICT goods and digital infrastructure remain essential. However, such required efforts as acknowledged by the AfCFTA digital trade protocol (Article 36.c and Article 18.c) will first necessitate the removal of regulatory bottlenecks in other specific policy areas. Precisely, a more granular investigation of the RDTII data show that 48 African countries have regulatory measures limiting the share of foreign equity for digital services providers or requiring commercial presence of the interested providers to be considered/screened for investment's participation and for subsequent potential operation. Furthermore, and in line with Article 36.a of the AfCFTA digital trade protocol, calling on countries to eliminate tariffs and non-tariff barrier to trade in ICT goods, the number of quantitative trade restrictions (non-technical NTMs) should be significantly reduced to support intra-African digital trade, as demonstrated under sub-section 4.2 (see expected impact of pillar 10 of RDTII on intra-African digital trade; table 3).

The AfCFTA digital trade protocol also recognizes the importance of making electronic signatures, documents, and stamps universally admissible across the continent (Article 8 and Article 13). Digital identities are also highlighted as areas of importance in the protocol which mandates the development of an annex to standardize related measures continental-wide (Article 14). Furthermore, the protocol emphasizes the need for coordination in digital payment systems (Article 43) and stresses the importance of online consumer protection (Article 27). The findings discussed in sub-section 4.2 confirm the importance of addressing such issues showing the expected detrimental effects of restrictive measures, particularly in the areas of online sales and transactions (RDTII pillar 12; see Table 3). For more effective implementation of the protocol in those areas, the RDTII data suggest that African countries could better integrate into relevant international conventions and laws governing, including ratifying and implementing the UN Convention on Electronic Communications, the UNCITRAL Model Law on Electronic Commerce, and the UNCITRAL Model Law on Electronic Signatures.

Finally, an area of particular importance identified in this study for its potential impact on intra-African trade, but which is out of the scope of the AfCFTA digital trade protocol (see Article 3) has to do with government procurement. Indeed, findings (see RDTII pillar 2 under Table 3) demonstrate that the current domestic regulations governing public procurement of ICT goods and digitally enabled services in African countries strongly hinder intra-African digital trade. This is an area not to be overlooked as the AfCFTA digital trade protocol is implemented, and in line with the provisions under the AfCFTA protocol on competition policy. For instance, specific measures could be considered to facilitate the participation, in public procurement processes, of foreign (in the sense of non-domestic) African firms.

5. Conclusion and policy recommendations

This study analyzes the impact of digital trade-related regulations on intra-African digital trade. It is based on ECA-ECLAC-ESCAP Regional Digital Trade Integration Index (RDTII) that assesses the degree to which the current regulatory environment of a region, here Africa, or each country within that region, here all the 54 African countries, hinder regional digital trade integration across 12 identified policy domains (or pillars) and a total of 65 measures (or indicators) distributed under the various pillars.

After presenting a few stylized facts about what the RDTII means for Africa, including the apparent correlation between intra-African digital trade and the RDTII – either the index scores or the number of restrictive regulatory measures under the index – simply based on crossing available data, an econometric analysis using gravity modeling is undertaken to empirically test the relationships.

Findings from the econometric analysis show that both the level of restrictiveness of regulations (based on Africa's RDTII score) and the number of the restrictive regulatory measures in the RDTII limit intra-African digital trade, with the intensity of the restriction having a greater negative impact than the number of restrictions. Specifically, a 1% reduction in Africa's RDTII score is expected to boost intra-African digital trade by 21.5% (or USD 508 million), whereas a 1% reduction in the number of restrictive regulatory measures is projected to increase intra-African digital trade by just 0.25% (or USD 6 million).

The econometric analysis further indicates that the overall negative impact of digital trade-related regulations on intra-African digital trade is grounded in 8 policy areas (or RDTII pillars), namely public procurement, domestic data protection and privacy, standards and procedures, IPRs, online sales and transactions, telecom regulation and competition, cross-border data policies, non-technical NTMs. What differs among those areas is the channel through which they would impact intra-African digital trade. Specifically, both the intensity level of restrictiveness of regulations and the number of the restrictive regulatory measure are foreseen to undermine intra-African digital trade in the former three policy areas; when in the other five policy areas, either only the level of restrictiveness of regulations would negatively impact intra-Africa digital trade (policy areas of IPRs, and online sales and transactions) or only the number of the regulatory restrictions would reduce intra-Africa digital trade (telecom regulation and competition, cross-border data policies, non-technical NTMs). In other words, and whereas all the 8 policy areas require attention for the member States, tackling regulatory issues related to public procurement, domestic data protection and privacy, standards and procedures may turn out to be most effective at enhancing intra-African digital trade considering the greater number of channels (intensity and number of restrictive measures) through which they can be acted upon.

Additionally, and through the introduction of a similarity (or heterogeneity) index that measures the degree of regulatory alignment (misalignment) between pairs of African countries, the analysis reveals the importance for member States to harmonize rules governing cross-border data policies to significantly increase digital trade across the continent.

Finally, putting the results from the empirical analysis– combined with the rich data from the RDTII– in parallel with the provisions of the AfCFTA digital trade protocol, several specific priority actions can be put forward to the member States to enhance the likelihood and effectiveness of the implementation of the protocol to boost intra-African digital trade. Firstly, and as already mentioned, harmonizing cross-

border data policies through reducing the number of regulatory restrictions is essential. To that end, member States could consider urgently reducing bans on data transfers and easing requirements for local processing, while at the same time adopting effective legal frameworks for data protection, ideally a single continental-wide framework with the Malabo Convention – which/ whose revitalization is much needed – as a starting point. Secondly, another top priority area where addressing regulatory issues could strongly stimulate intra-African trade in the context of the AfCFTA digital trade protocol's implementation is around standards and to increase cooperation across the Continent, beginning with the certification of products to be traded digitally, along with improving screening and testing requirements as well as the development/enhancement of encryption standards which are critical for data protection and privacy. Thirdly, and as a pre-requisite for promoting and facilitating investment in ICT goods and digital infrastructure which are vital for digital trade to pick up on the African continent, specific regulatory bottlenecks should be addressed. Those include, among others, reconsidering foreign equity share and commercial presence requirements for providers of digitally enable services, improving application and screening mechanisms to investment. But also tackling quantitative trade restrictions (non-technical NTMs) for ICT goods and digitally enabled services, beyond reducing tariffs and NTMs on intra-African digital trade and in alignment with the schedules of tariff concessions under the AfCFTA protocol on trade in goods, including the removal of unnecessary or/and prolonged import bans and export restrictions on ICT goods. Fourthly, and beyond the expansion of effective and secured online payment systems (such as the Pan-African Payment and Settlement System-PAPSS), member States should consider signing, ratifying and implementing important international conventions and laws, such as the UN Convention on Electronic Communications, the UNCITRAL Model Law on Electronic Commerce, and the UNCITRAL Model Law on Electronic Signatures, to facilitate online sales and transactions that are not surprisingly empirically found to be critical to increase intra-African digital trade. Fifthly, implementing the AfCFTA protocol on digital trade must be done without overlooking the commitments made under AfCFTA protocol on competition policy. Indeed, this analysis demonstrated that the current domestic regulations governing public procurement of ICT goods and digitally enabled services in African countries strongly hinder intra-African digital trade. In that sense, member States should consider measures to facilitate the participation of African firms, beyond just the domestic ones, from public procurement processes to promote intra-African digital trade.

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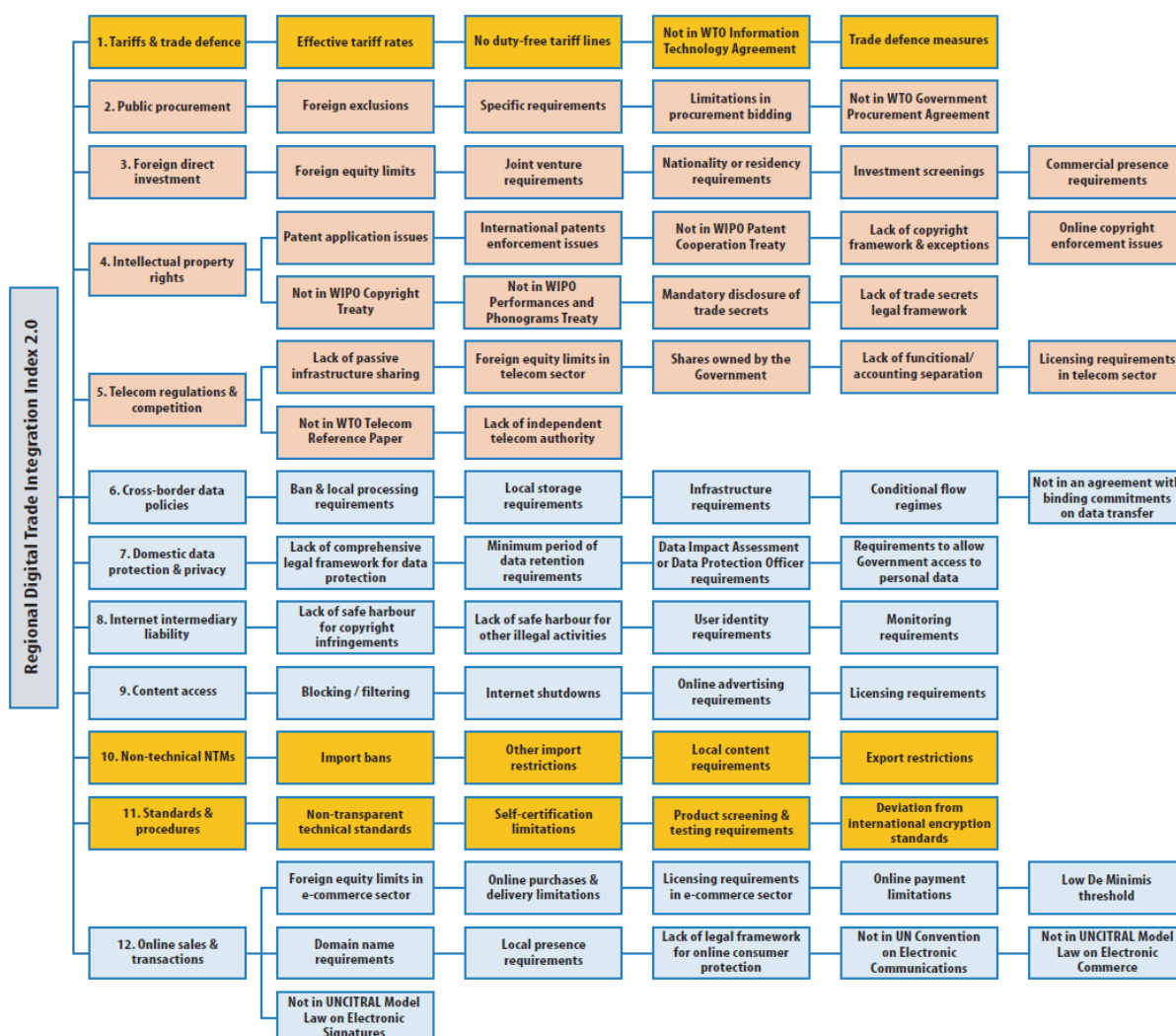
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7. Appendix

7.1 List of RDTII pillars and measures



Source: *Regional Digital Trade Integration Index 2.0: A Guide*

7.2 Correspondence table between pillars and trade sectors

Pillar	Indicators	Digital trade coverage	Data source
1	Tariffs and trade defence measures applied on ICT goods	ICT goods	ITPD-E
2	Public procurement of ICT goods, products and online services	ICT goods + digital-enabled services	ITPD-E
3	Foreign direct investment in sectors relevant to digital trade	ICT goods + digital-enabled services	ITPD-E
4	Intellectual Property Rights (IPRs)	ICT goods + digital-enabled services	ITPD-E
5	Telecom regulation and competition	Digital-enabled services	BaTiS
6	Cross-border data policies	Digital-enabled services	BaTiS
7	Domestic data protection and privacy	Digital-enabled services	BaTiS
8	Internet intermediary liability	Digital-enabled services	BaTiS
9	Content access	Digital-enabled services	BaTiS

10	Quantitative trade restrictions for ICT goods, products and online services (non-technical NTMs)	ICT + digital-enabled services	ITPD-E
11	Technical standards applied to ICT goods, products and online services (standards and procedures)	ICT + digital-enabled services	ITPD-E
12	Online sales and transactions	Digital-enabled services	BaTiS

Source : ECA, 2023.

7.3 Gravity results by pillar of the RDTII

RDTII Pillars	Number of restrictive measures in RDTII pillars	RDTII pillar score [0-1]
Pillar 1 : Tariffs & Trade Defense	1.125*	2.781**
Pillar 2 : Public Procurement	-2.496**	-7.646***
Pillar 3 : FDI	1.729***	6.091***
Pillar 4 : IPRs	0.676*	-6.086***
Pillar 5 : Telecom Regulation & Competition	-1.219**	5.187
Pillar 6 : Cross-Border Data Policies	-1.400***	2.781**
Pillar 7 : Domestic Data Protection & Privacy	-0.896*	-6.363***
Pillar 8 : Internet Intermediary Liability	1.452***	-3.236
Pillar 9 : Content Access	-0.613	4.473**
Pillar 10 : Non-Technical NTMs	-2.908***	-2.533
Pillar 11 : Standards and Procedures	-1.839***	-16.765***
Pillar 12 : Online Sales and Transactions	-0.242	-7.162***

Source: Authors' calculation based on gravity modeling; Notes : *, **, *** denote significance at the 10, 5 and 1 percent level, respectively. Robust clustered standard errors are not reported under each coefficient for brevity. Every estimation has been done with importer and exporter fixed effects

7.4 Digital Trade Regulatory Similarity (DTRS) index

Calculation

Studies of the relationship between regulatory heterogeneity and trade clearly highlight the role of a harmonized regulatory environment (Nordås, 2016). Indeed, it is not only the presence of regulations – which often are key for a healthy and energetic trade environment – but rather its fragmentation that yields economic costs. With that in mind the Digital Trade Regulatory Similarity (DTRS) index was developed. Conceptually, similarity can be understood as the complement of distance (i.e., Similarity = 1 – Distance). In turn, distance simply measures the absolute difference between two points. In this case, the complement (1 –) of the distance between policy p of i a reporter i ($RDTI_i^p$) and a partner j ($RDTI_j^p$) is taken. Mathematically, for any given policy and reporter-partner pair (i, j):

$$DTRS_{ij}^p = 1 - \overset{\text{Policy (p) distance}}{\overleftrightarrow{\text{abs}(RDTI_i^p - RDTI_j^p)}}$$

Policy similarities are then aggregated to pillar (P) level. The aggregation method follows the principal as the RDTII 2.0 aggregation that use weight average approach, reflecting different importance of measures considered. Specifically, a weighted average, which, for a pillar P comprises of a set of policies $p \in P$ and $\sum_{p \in P} * weight_p^P = 1$ can be represented as:

$$DTRS_{ij}^p = \overset{\text{Policy (p) similarity}}{\overleftrightarrow{\sum_{p \in P} DTRS_{ij}^p * weight_p^P}}$$

It is important to note that measuring similarity at the policy level before aggregating into pillars is crucial for understanding regulatory fragmentation. For example, if countries i and j both achieve high RDTII 2.0 scores in Pillar 12 (Online sales and transactions) due to different regulatory measures (such as strict licensing requirements for e-commerce service providers in country i and low de minimis thresholds in country j), they should not be considered highly similar in regulatory terms.

Source : ECA-ECLAC-ESCAP-2024b

7.5 Similarity index correlation with Digital trade

VARIABLES	TOT	PILLAR 1	PILLAR 2	PILLAR 3	PILLAR 4	PILLAR 5	PILLAR 6	PILLAR 7	PILLAR 8	PILLAR 9	PILLAR 10	PILLAR 11	PILLAR 12
ln_dist	-0.917*** (0.290)	-0.936*** (0.316)	-0.912*** (0.287)	-0.943*** (0.269)	-0.924*** (0.284)	-1.001*** (0.098)	-0.947*** (0.097)	-0.949*** (0.099)	-0.984*** (0.097)	-0.953*** (0.100)	-0.925*** (0.293)	-0.892*** (0.287)	-0.951*** (0.097)
Contiguity	0.726* (0.373)	0.684* (0.382)	0.659* (0.343)	0.507 (0.347)	0.716** (0.354)	-0.347** (0.153)	-0.277* (0.152)	-0.269* (0.150)	-0.324** (0.149)	-0.284* (0.151)	0.703* (0.365)	0.801** (0.368)	-0.288* (0.156)
Legal	1.077*** (0.363)	1.087*** (0.368)	1.076*** (0.345)	0.951*** (0.363)	1.070*** (0.386)	-0.082 (0.162)	-0.082 (0.160)	-0.056 (0.152)	-0.050 (0.162)	-0.053 (0.159)	1.000*** (0.379)	1.065*** (0.361)	-0.051 (0.157)
Language	0.089 (0.403)	0.052 (0.425)	0.167 (0.418)	0.272 (0.426)	0.136 (0.418)	0.403*** (0.117)	0.412*** (0.111)	0.382*** (0.113)	0.381*** (0.114)	0.393*** (0.109)	0.112 (0.418)	0.128 (0.406)	0.388*** (0.110)
RTA	2.258*** (0.491)	2.176*** (0.454)	2.283*** (0.481)	2.594*** (0.422)	2.254*** (0.477)	-0.057 (0.172)	-0.031 (0.182)	-0.009 (0.186)	-0.050 (0.171)	-0.011 (0.206)	2.233*** (0.500)	2.248*** (0.452)	-0.015 (0.189)
Similarity	-4.255 (5.352)	2.053 (1.753)	-2.901 (2.885)	1.370** (0.608)	-1.818 (2.030)	0.575 (0.732)	-1.083** (0.516)	0.502 (0.651)	0.723 (0.476)	-0.212 (0.449)	0.639 (0.837)	0.804 (1.125)	-0.472 (0.743)
Similarity*RDTII	13.598 (16.009)	-5.840 (3.684)	5.280 (6.827)	1.927 (1.666)	2.812 (4.620)	-2.238 (1.821)	2.565* (1.326)	-0.601 (1.400)	-0.887 (0.980)	0.419 (0.986)	2.422 (2.347)	-4.575 (2.963)	1.185 (1.652)
FE Exp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE Imp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,050	2,050	2,050	2,050	2,050	2,450	2,450	2,450	2,450	2,450	2,050	2,050	2,450
R-squared	0.993	0.993	0.993	0.994	0.993	0.962	0.960	0.958	0.958	0.959	0.993	0.993	0.959

Source: Authors' calculation based on gravity modeling; Notes : *, **, *** denote significance at the 10, 5 and 1 percent level, respectively. Robust clustered standard errors reported under each coefficient . Every estimation has been done with importer and exporter fixed effects