



Key issues in Digital Trade

OECD Global Forum on Trade 2023
“Making Digital Trade Work for All”

October 2023

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Key points

- Digitalisation is profoundly impacting international trade, changing its scale, scope and speed. It has led to more traditional trade, more digitally ordered parcels, more digitally delivered services, more ‘smart’ and connected goods, and more data crossing international borders.
- Indeed, digital connectivity leads to lower trade costs meaning more domestic and international trade across all sectors of the economy and for countries at all income levels.
- Digitalisation also enables more inclusive outcomes by increasing opportunities for those that find it most difficult to engage in, and benefit from, trade, including smaller and women-owned firms.
- Digital trade continues to grow; in 2020, it represented around 25% of total trade. The Indo-Pacific region is particularly dynamic.
- However, the domestic regulatory environment that underpins digital trade is becoming increasingly restrictive making it more difficult for consumers and businesses to seize some of these new opportunities. This is especially the case for regulations in the area of communications infrastructure and data connectivity, as well as in supporting services such as computer and telecommunications services.
- African countries have the highest levels of restrictions, but they are also the top reformers. In OECD countries, barriers are lowest, but the trend is towards further tightening.
- Measures affecting the movement of data across borders, including provisions that mandate that data be stored domestically (data localisation), are also growing and becoming increasingly restrictive, especially in non-OECD countries.
- In parallel, and partly in response to this growing fragmentation, there is an ongoing push towards greater international co-operation on issues related to digital trade, including at the WTO, in trade agreements, in new digital economy agreements, and in other international and regional fora. Efforts to build regulatory bridges and common approaches on digital trade disciplines are gaining ground.
- In this area, there is a strong economic case to renew the e-commerce Moratorium at the 13th WTO Ministerial Conference (MC13). Evidence suggests that its fiscal implications are small and that any losses would be offset by rising VAT/GST revenue. Low-income countries and MSMEs would bear significant costs should the Moratorium be lifted.

1 Digitalisation gives rise to new opportunities and challenges for trade

Digital transformation has led to unprecedented reductions in the costs of engaging in international trade, changing how and what we trade, and contributing to growing competitiveness (OECD, 2017^[1]; WTO, 2018^[2]). Digitalisation has changed the scope and speed of the activities undertaken by firms; allowing production activities to move faster and with greater ease; providing new ecosystems for exchange; and helping firms, especially micro, small and medium-sized enterprises (MSMEs), to better connect with each other and with consumers across the globe. Digital tools and growing digital connectivity also provide avenues for greater supply chain resilience, and can help support and speed up the green transition.

Yet as a result of digitalisation, trade has also become more complex (López González and Ferencz, 2018^[3]). Governments are faced with new regulatory challenges to ensure that the opportunities and benefits from digital trade, for both consumers and businesses, can be realised and shared more inclusively. With the right policies in place, digital transformation can help to create a more prosperous and inclusive world.

This report aims to help countries in their path to ensuring that digital trade works for all. It begins with a discussion in Section 2 of what digital trade is and why it matters, underscoring its potential to enable more inclusive outcomes. Section 3 then provides new insights on the evolving domestic regulatory environment, showcasing the latest findings from the Digital Services Trade Restrictiveness Index (DSTRI) update now covering 101 countries from 2014 to 2022. It also highlights the growth and increasing restrictiveness of data localisation measures. Section 4 discusses ongoing efforts to bridge existing digital fragmentation through growing international cooperation, highlighting new results from the OECD Digital Trade Inventory. Finally, Section 5 drills down on the WTO e-commerce Moratorium, which is the only existing WTO provision that explicitly applies to digital trade, making the case for its renewal at the next Ministerial Conference (MC13) in February 2024.

2 Digitalisation is revolutionising international trade

2.1. What is digital trade and why does it matter?

Digital trade can be understood as a modern take on the WTO definition of e-commerce: the "production, distribution, marketing, sale or delivery of goods and services by electronic means". However, the term is often used to refer to a combination of issues.

For *measurement purposes*, it is defined as "all international trade that is digitally ordered and/or digitally delivered" (OECD, WTO, IMF, 2020^[4]), (IMF et al., 2023^[5]). It therefore incorporates a subset of trade in goods which have been digitally ordered, often through digital platforms, such as a mobile phone that arrives at your doorstep via a parcel. Digital trade also includes a subset of services trade when these services are digitally ordered and/or digitally delivered, such as online communication and Internet access services or content streaming services.

In *policy discussions*, the term digital trade is used to refer more broadly to *trade in the digital era*. Beyond digitally ordered and/or delivered goods and services this includes: i) rising trade across all sectors of the economy due to lower trade costs spurred by rising digital connectivity; ii) digitalisation of trade documents and processes, including at the border; and iii) increased flows of data across international borders in support of international trade transactions.

The impact of digitalisation on trade has been revolutionary

Digitalisation increases the scale, scope, and speed of trade, allowing firms to bring new products and services to a larger number of digitally-connected customers across the globe. It also enables firms, notably smaller ones, to use new and innovative digital tools to overcome barriers to growth.

Digitalisation changes how we trade goods. For example, the growth of online platforms has led to a rising number of small parcels crossing international borders (López González and Sorescu, 2021^[6]). This is generating a variety of issues for policy makers, including at the border, ranging from the physical management of parcel trade, through to the implications for risk management (as concerns, for example, counterfeit goods or biosecurity standards), and revenue implications in relation to the collection of taxes and tariffs (Andrenelli and López González, 2019^[7]).

In addition, digital technologies can help reduce the costs of trade at different stages of the supply chain. Sustained implementation of the WTO Trade Facilitation Agreement (TFA) has enabled the wider digitalisation of trade processes through electronic submission and processing of trade documents, use of digital certificates and signatures, and implementation of electronic trade Single Windows (OECD, 2023^[8]). In agriculture and food trade, digital technologies enable the exchange of sanitary and phytosanitary electronic certificates (e-certification) for plant and animal products, conformity assessment platforms, traceability and supply chain integrity technologies, remote pest screening, and advanced consignment declarations and checks (OECD, 2021^[9]).

Meeting new regulatory requirements, product standards, and sustainability demands will require the ability to track, report and monitor information between supply chain actors, including on environmental impacts along a product's life cycle (e.g. tracking carbon footprint). In this context, digital technologies are also playing an increasing role in enabling the exchange of information (and related data or documentary requirements) at different steps of the supply chain.

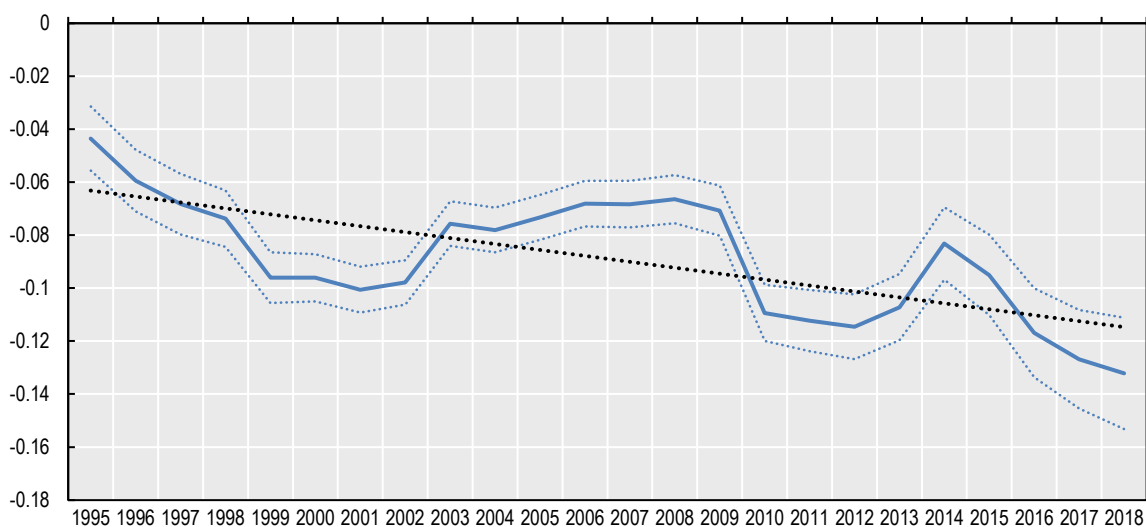
Rapid technological developments are also facilitating the rise of services in international trade. Information and communication technology services are the backbone of digital trade, providing the necessary network infrastructure, and underpinning the digitisation of other types of services (Benz, Jaax and Yotov, 2022^[10]). At the same time, digitalisation is making more existing services tradeable and giving rise to new services (e.g. cloud computing or e-payments). Moreover, new technologies and business models are blurring already grey distinctions between goods and services and modes of delivery, and introducing new combinations of goods and services (Aoki et al., 2023^[11]).

Digital connectivity means lower trade costs

Digital connectivity has played a key role in reducing both domestic and international trade costs. Estimates suggest that a 1% increase in digital connectivity is associated with a 0.3% reduction in domestic trade costs and a 0.1% reduction in international trade costs. Enhancing digital connectivity therefore delivers a double dividend in the form of lower domestic and international trade costs. Importantly, the impact of digital connectivity on international trade costs is three times higher in 2018 than it was in 1995 (López-Gonzalez, Sorescu and Kaynak, 2023^[12]) (Figure 1).

Figure 1. The trade cost reducing impact of digital connectivity is three times higher today than in 1995

Impact of digital connectivity on international trade costs by year (1995-2018)



Note: The graph plots the impact of increasing minimum digital connectivity on international trade costs. Blue dotted lines show the 95% confidence intervals.

Source: López González, Sorescu and Kaynak (2023^[12]).

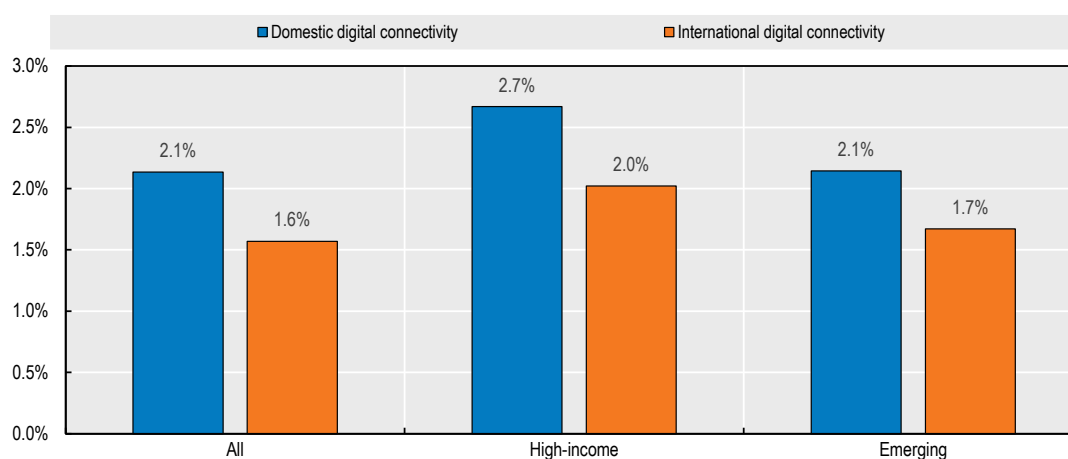
Digital connectivity delivers a double dividend

The trade-cost reducing impact of digital connectivity translates into a quantitatively significant trade flow increasing effect. On average, a 1% increase in domestic digital connectivity is associated with a 2.1% increase in domestic trade and a 1.5% increase in international trade (Figure 2, Panel A). The impact of digital connectivity on trade is found to be a little larger for high-income countries than it is for emerging economies. Digital connectivity matters also for lower-income economies, as they would benefit from a larger impact on international trade from improved digital connectivity than would upper-middle income economies (López-Gonzalez, Sorescu and Kaynak, 2023^[12]).

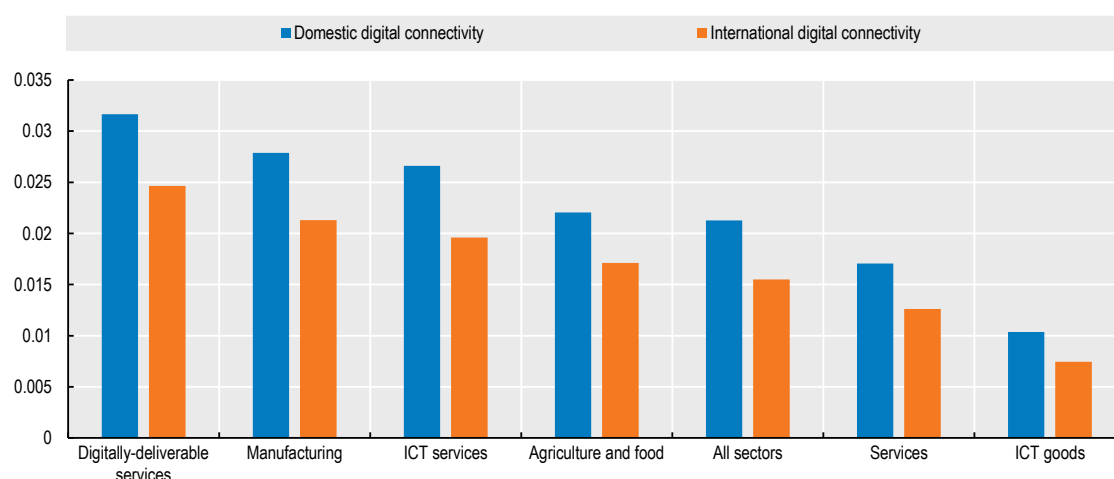
The benefits of growing digital connectivity extend beyond ‘digital’ sectors. They are, as expected, largest for digitally deliverable services, but they are also important for manufacturing and for agriculture and food produce (Figure 2, Panel B). The digital transformation is key for traditional sectors.

Figure 2. Growing digital connectivity delivers a double dividend

- A. Impact of a 1% improvement in bilateral digital connectivity on domestic and international trade by income level



- B. Impact of a 1% improvement in bilateral digital connectivity on domestic and international trade by sector



Note: Results from a gravity model for the period 1995-2018 using PPML and reporter-sector-year and partner-sector-year fixed effects.
Source: López González, Sorescu and Kaynak (2023^[12]).

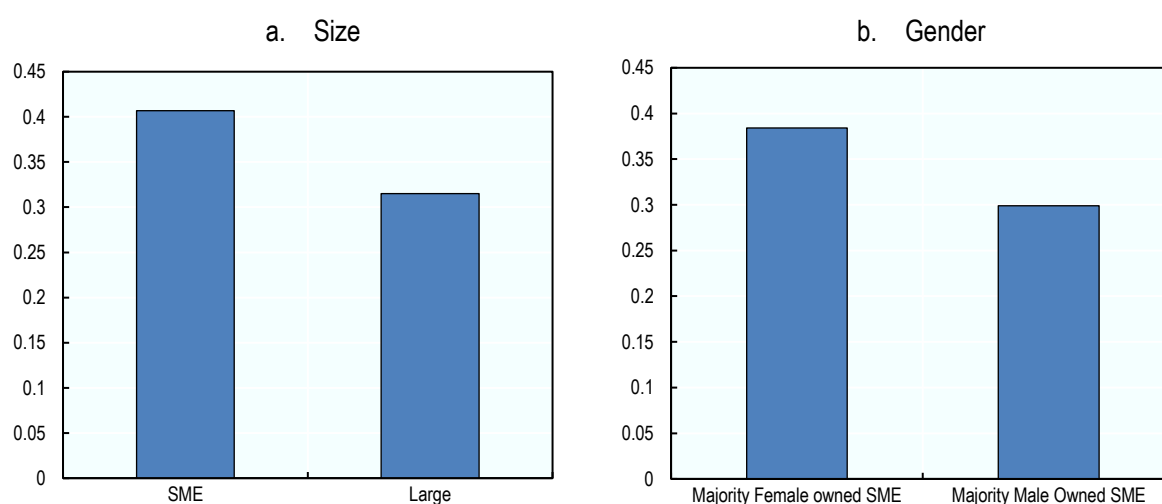
Digitalisation leads to more inclusive outcomes

By using digital tools to sell goods across borders, including digital platforms or websites, micro, small and medium-sized enterprises (MSMEs) and women entrepreneurs can internationalise at lower cost. Better and faster access to critical knowledge and information help smaller actors overcome informational disadvantages, notably with respect to larger firms, and compete on a more even footing. Digital platforms are also increasingly providing new ecosystems for exchange, enabling greater access to warehousing, logistics, e-payment, credit and insurance services for smaller actors.

Evidence suggests that the use of digital tools like webpages is linked with greater export propensities for MSMEs and for women-owned firms (Andrenelli and López González, forthcoming^[13]) (Figure 3). Moreover, automation of border processes can also help MSMEs in developed and developing countries to engage in international trade and increase the value of their exports and imports by between 4.5% and 6.5% (López González and Sorescu, 2021^[14]).

Figure 3. The use of digital tools enables more inclusive outcomes

Impact of using webpages on firms' propensity to export



Note: Calculations based on World Bank Enterprise Survey. SME defined as firm below 100 employees.

Source: Andrenelli and López González (forthcoming^[13])

2.2. How important is digital trade?

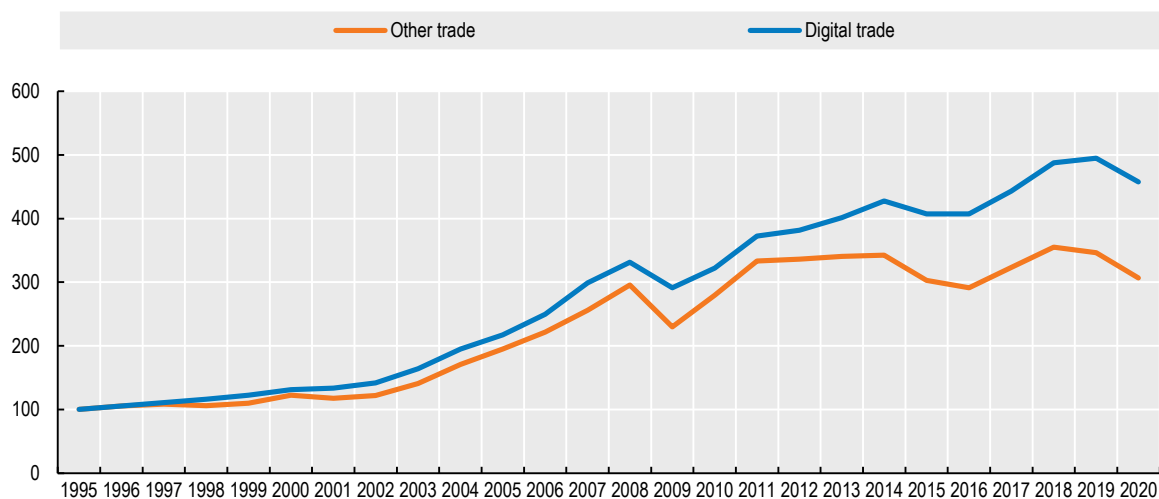
Measuring digital trade is not easy, but an inter-agency process is underway to better capture it in trade statistics (OECD, WTO, IMF, 2020^[4]) (IMF et al., 2023^[5]). This exercise suggests that existing trade statistics do not significantly underestimate digital trade; the challenge is to make digital trade visible. That is, a digitally-ordered book is captured in trade statistics under the relevant customs code, but the statistics will not distinguish whether that book has been digitally ordered or not. Similarly, measurement of cross-border transactions in services has always been difficult, but for digital trade the challenge is compounded by the need to identify those services which have been digitally ordered and those which have been digitally delivered. In the absence of comprehensive and comparable (official) digital trade statistics, proxy measures can be used to get a sense of the nature and evolution of digital trade (López-Gonzalez, Sorescu and Kaynak, 2023^[12]).

Digital trade is growing and changing

The digital transformation has been ongoing for several decades, however a clearer decoupling in the rate of growth of global digital trade relative to 'other trade' has been apparent since 2011 (Figure 4). By 2020, digital trade represented 25% of global trade, or just under USD 5 trillion.

Figure 4. Digital trade is growing faster than non-digital trade

Growth of trade



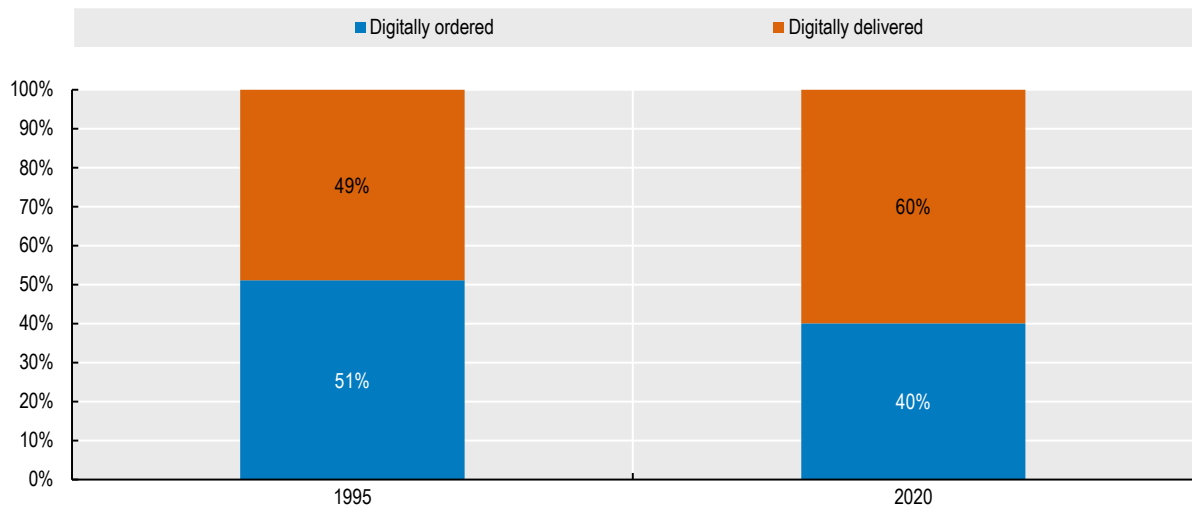
Note: Changes in exports relative to 1995 (1995=100).

Source: Own calculations using TiVA database (2023).

The structure of digital trade has also been changing. In 1995, digitally delivered trade represented around 49% of estimated digital trade. By 2020, this share had grown to 60% (Figure 5). This is driven by increases in *ICT services*, which represented 14.2% of estimated digital trade in 2020 (up from 6.9% in 1995). Overall, while changes are relatively minor, they point to digital trade becoming more digitally delivered (and therefore services oriented).

Figure 5. Digitally delivered trade is increasingly important

Share of digital trade by type



Note: Digitally delivered trade is identified as ICT services (ISIC 61, 62, 63) and other digitally-deliverable services (ISIC 58 to 60, 64 to 66 and 69 to 82). Digitally-ordered trade is identified as digital inputs (ICT goods and services and other digitally-deliverable services) in non-digital sectors (all those not counted as digital).

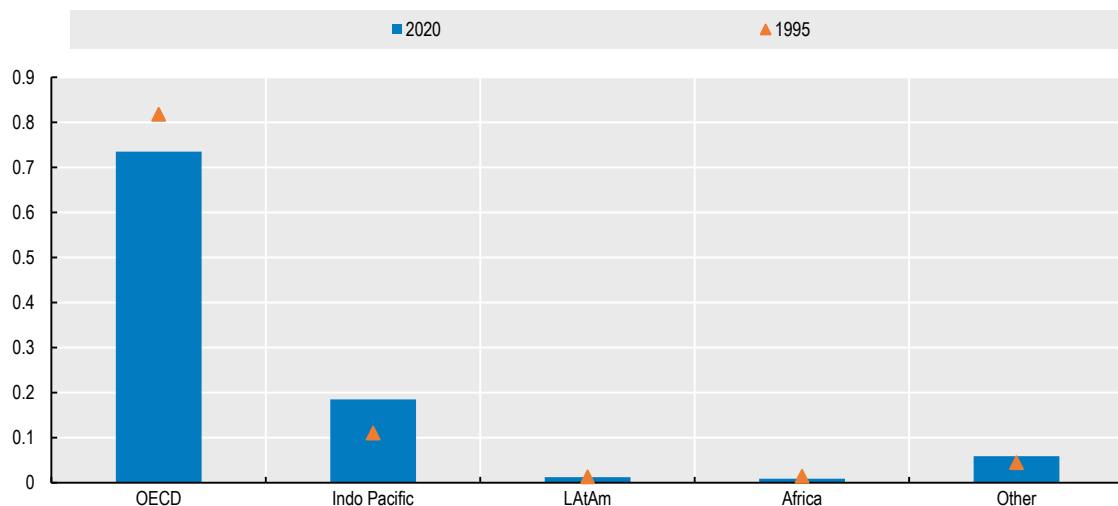
Source: Own calculations using OECD TiVA 2023 revision.

...creating new opportunities for more countries

In 1995, OECD countries represented 82% of global estimated digital trade exports, by 2020 that share had fallen to 73%. The Indo Pacific region witnessed the largest increases, with a share of 18% of global digital trade (up from 11% in 1995) (Figure 6).

Figure 6. The geography of digital trade is shifting, particularly to the Indo-Pacific region

Share of global digital trade exports by region



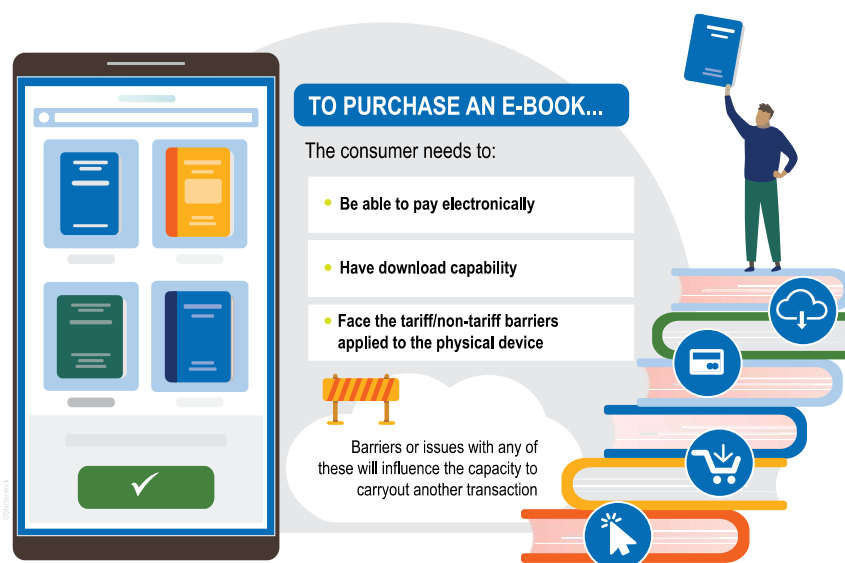
Note: Regions are mutually exclusive, so bars add up to 100%.

Source: Own calculations using OECD TiVA 2023 revision.

2.3. Digitalisation requires new approaches to market openness

Today, a simple digital trade transaction rests on a series of enabling or supporting policies. An example is ordering an e-book (Figure 7). To do so, a consumer must have a good quality and affordable network connection to access a retailer's website, be able to pay for the purchase electronically, and be able to read the book on a compatible device, the price of which is affected by tariff and non-tariff barriers. A barrier to any one of these steps will influence the ability to undertake the entire transaction. Market openness in the digital era should therefore be approached more holistically (López González and Ferencz, 2018^[3]).

Figure 7. The purchase of an e-book is underpinned by many different transactions



Source: López González and Sorescu (2021^[14]).

3 Barriers to digital trade are increasing

3.1. The domestic regulatory environment is becoming increasingly restrictive

Regulatory barriers make it more cumbersome and costly for firms to engage in digital trade. Evidence from the recently updated OECD Services Trade Restrictiveness Index (STRI) and the OECD Digital Services Trade Restrictiveness Index (Digital STRI) provide up-to-date insights that contribute to a better understanding of existing barriers affecting digital trade.

The OECD STRI and Digital STRI capture different elements of importance to the digital trade landscape. The Digital STRI identifies cross-cutting barriers that affect cross-border digital trade activities, these include, for example, the presence of overarching restrictions on cross border data flows. In turn, the STRI provides insights into sector specific regulatory barriers and can be used to track restrictions to key sectors that enable digital trade, such as computer services, telecommunications, courier, distribution, commercial banking and content related services) (Box 1).

These indicators show that regulatory barriers to digital trade remain high (Figure 8, Panel A). Barriers are especially high in courier and telecommunications services which are key to enabling e-commerce both through effective parcel delivery and access to communication infrastructures.

Box 1. The STRI and the DSTRI

The Digital STRI and the STRI identify, catalogue, and quantify barriers that affect trade in services, including digitally-enabled services, presenting these in a transparent and comparable manner. The Digital STRI captures cross-cutting barriers that affect cross-border digital trade activities. The sectoral STRIs provide insights into sector-specific regulatory barriers including those affecting foreign direct investment, the movement of services providers, and barriers to competition specific to each sector. As such, information from key sectoral STRIs that enable digital trade, such as computer services, telecommunications, courier, distribution, or commercial banking services as well as key content related services such as motion pictures, provides a more comprehensive overview of the regulatory environment affecting digital trade.

The Digital STRI and the STRI have two components: a publicly available regulatory database, including information on applied regulations, and composite indices ranging between 0 (most open) and 1 (most restrictive) derived from the regulatory information. Both the Digital STRI and the STRI sectors cover annual data points between 2014 to 2022.

The Digital STRI and the STRI are respectively organised under the following policy areas:

Infrastructure and connectivity, electronic transactions, payment systems, intellectual property rights, and other barriers affecting trade in digitally enabled services for the Digital STRI.

Restrictions on foreign entry, restrictions to the movement of people, other discriminatory measures, barriers to competition, and barriers to regulatory transparency for the STRI sectors.

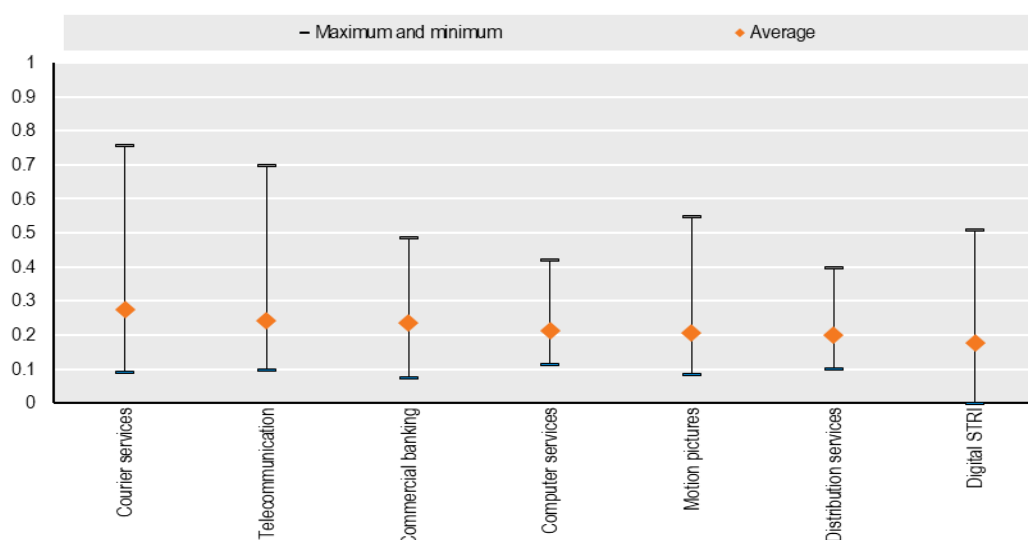
The STRI covers 50 countries (38 OECD countries, Brazil, the People's Republic of China, India, Indonesia, Kazakhstan, Malaysia, Peru, Russian Federation, Singapore, South Africa, Thailand, and Viet Nam). In addition to these countries, the Digital STRI covers 21 African countries (with additional countries currently in the process of being added), 12 Asia-Pacific countries, 12 Latin American countries, and 6 South-East European countries.

Source: Ferencz (2019^[15]).

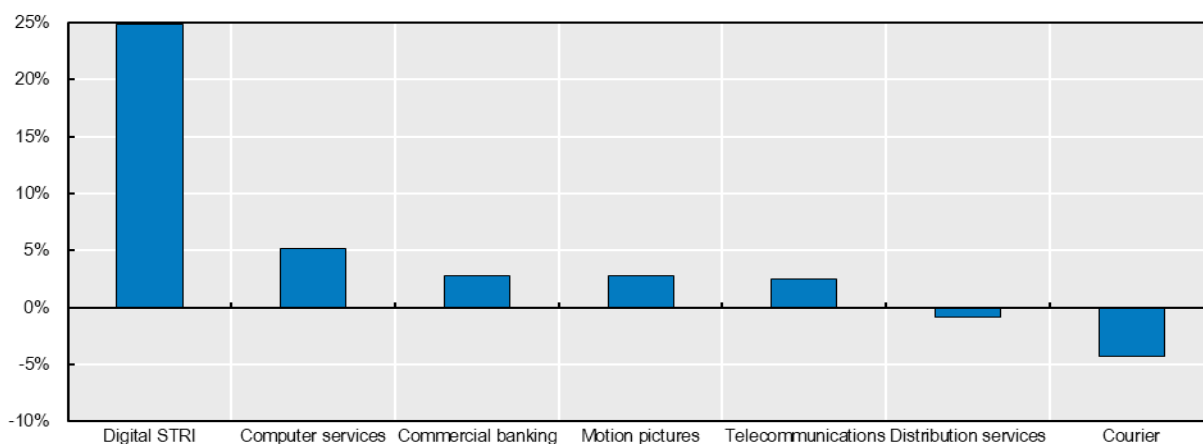
The number of regulatory barriers that affect digital trade has also been growing. The average Digital STRI values increased by as much as 25% in 2022 compared to 2014 (Figure 8, Panel B). Trade barriers have also increased in computer services (5%), followed by commercial banking and motion pictures (3%), and telecommunications (2%). Distribution services and courier services were the only two sectors with overall decreases in the averages, indicating reforms and liberalisations in general.

Figure 8. Barriers to digital trade are high and have been growing

A. Average, minimum and maximum scores for selected STRI sectors and the Digital STRI, 2022



B. Change in average Digital STRI and the STRI scores for selected sectors (%), 2014-22



Notes: The STRI and Digital STRI indices take values between zero and one, one being the most restrictive. Digital STRI coverage in this figure is only for 50 countries to match coverage for the other sectors.

Source: OECD STRI and Digital STRI (2022).

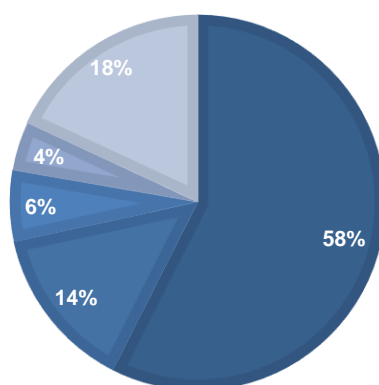
Most barriers relate to communications infrastructure and data connectivity

Globally, the DSTRI indicates that barriers are greatest in the area of infrastructure and connectivity (Figure 9). These are driven by limitations on cross-border data flows, data localisation requirements, and lack of pro-competitive regulations on interconnections across communications networks.

Figure 9. Barriers are mainly in communications infrastructure and connectivity

Contribution of policy areas to average Digital STRI score, 2022

■ Infrastructure and connectivity ■ Electronic transactions ■ Payment systems ■ Intellectual property rights ■ Other barriers



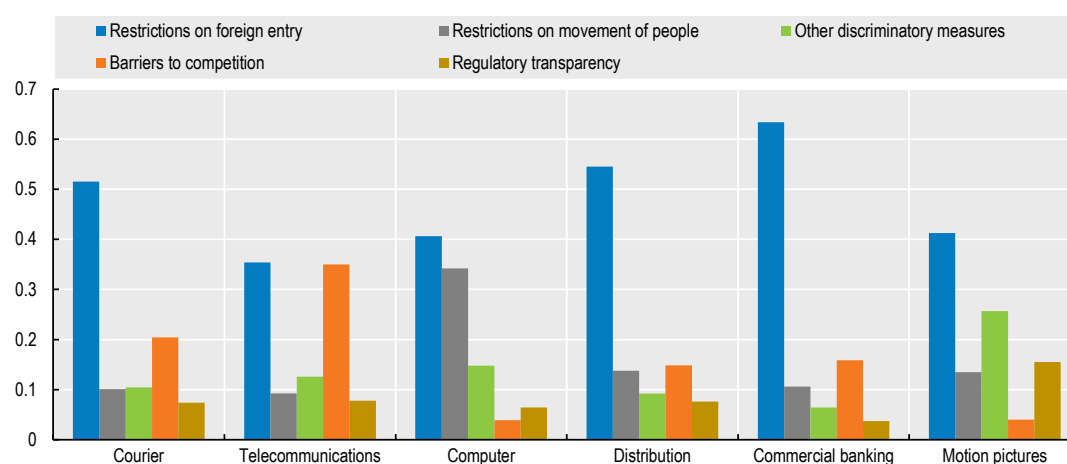
Source: OECD Digital STRI (2022).

Beyond the cross-cutting measures captured in the Digital STRI (Box 1), other sector-specific restrictions on foreign entry in services sectors critical for the digital transformation contribute the most to the STRI values, especially in commercial banking, distribution, and courier services (Figure 10). Common barriers are those relating mostly to foreign investment. Barriers to competition are also prevalent in some sectors

(notably telecommunications and courier services), as well as barriers related to the movement of professionals (computer services).

Figure 10. Restrictions on foreign entry prevail across sectors

STRI scores for selected sectors by policy area, 2022



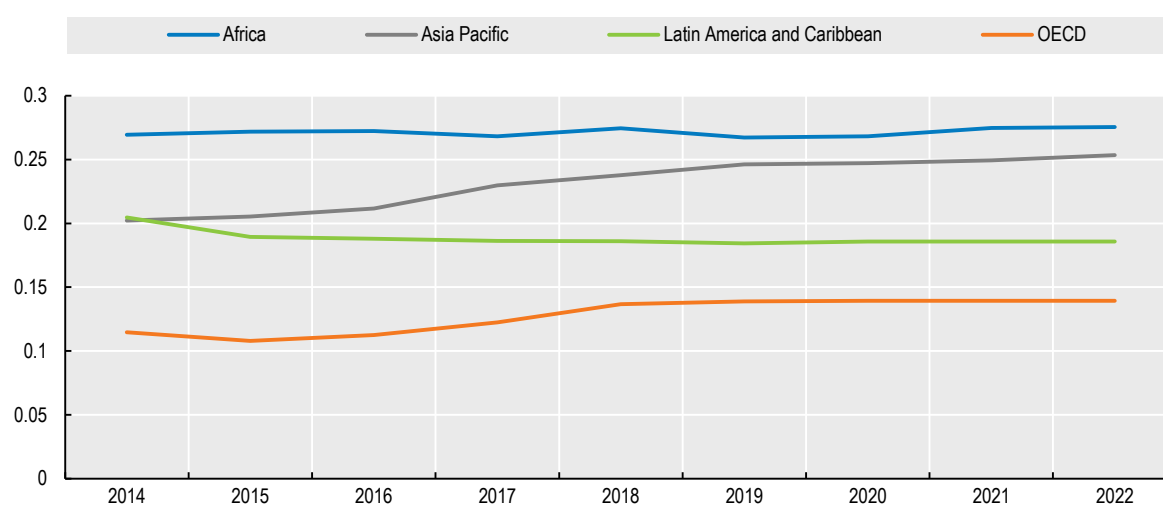
Source: OECD STRI (2022).

Digital trade regulation remains highly diverse across regions

From a regional perspective, African countries have the highest levels of restrictions, but are also the top reformers (Figure 11) with many economies having introduced significant liberalisation measures in recent years (Box 2). In the Asia-Pacific region, barriers are also high on average, and have been increasing in recent years. In OECD countries, barriers are the lowest, but the recent trend has been more tightening. In the Latin America and Caribbean region, the regulatory environment has been relatively stable over time with signs of moderate liberalisation.

Figure 11. Digital trade regulations differ across regions

Average Digital STRI scores across regions, 2014-22



Source: OECD Digital STRI (2022).

Box 2. Examples of recent liberalising reforms

New regulation on data protection and cross-border data flows in African countries

Between 2019 and 2022, eight African economies included in the Digital STRI (Eswatini, Kenya, Nigeria, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe) introduced regulatory frameworks governing data protection and cross-border data transfers. This is timely in the context of the negotiations for the Protocol on Digital Trade under the African Continental Free Trade Area (AfCFTA) agreement and the recent entry into force of the African Union Convention on Cyber Security and Personal Data Protection, which seeks to harmonise data protection regulation within the region.

Telecommunications reforms in Canada, Costa Rica, and Indonesia

As a result of reforms in 2021 in the telecommunications sector, regional mobile carriers in Canada are allowed to access the networks of all four carriers. In December 2022, the Costa Rican telecommunications law lifted exceptions to the public procurement law regarding alliances with foreign public companies. In 2021, Indonesia lifted equity caps on fixed and mobile telecommunications.

Source: OECD STRI and Digital STRI (2022).

There is a strong case for domestic regulatory reform

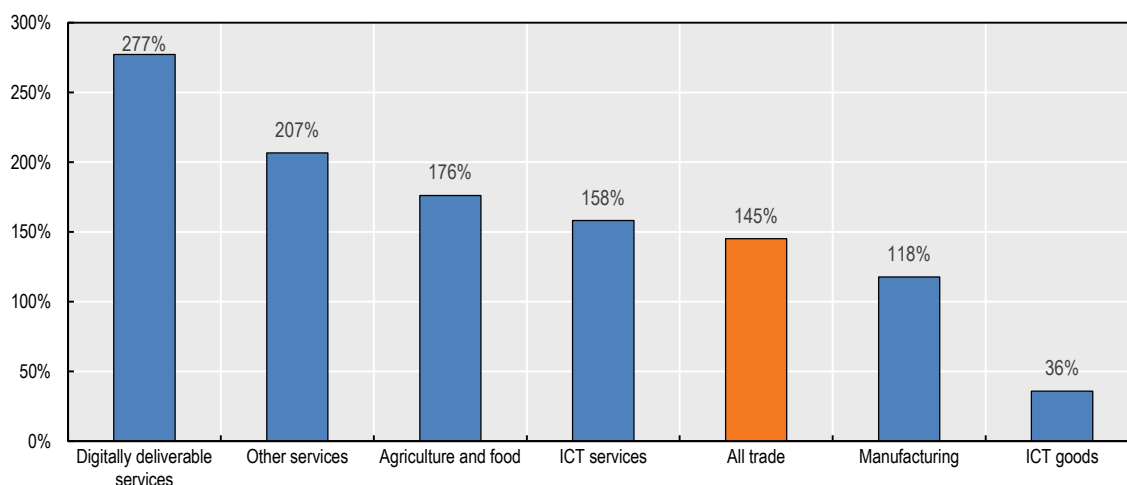
Reforms to make regulations less restrictive can bring significant payoffs. Estimates suggest that a 0.1-point reduction in the domestic DSTRI score (capturing an important domestic regulatory reform) is associated with an increase in total exports of 145% (Figure 12).¹ The effect is highest for digitally-deliverable services with increases in export of 277% and 'other services' exports (206%).

Importantly, the case for reform is not limited to services. An equivalent reduction in the domestic DSTRI score is associated with a 176% increase in exports in agriculture and food sectors, and a 117% increase in exports in manufacturing sectors. Regulatory reform is also seen to yield greater benefits for emerging economies than for high-income economies (López-Gonzalez, Sorescu and Kaynak, 2023^[12]).

¹ A 0.1-point change in the DSTRI can entail an important regulatory reform. For comparison, a 0.08 decrease captures a move from a more to a less restrictive approach to data transfers.

Figure 12. Domestic regulatory reform can lead to strong benefits for exporters

Impact of decreasing domestic DSTRI by 0.1 points



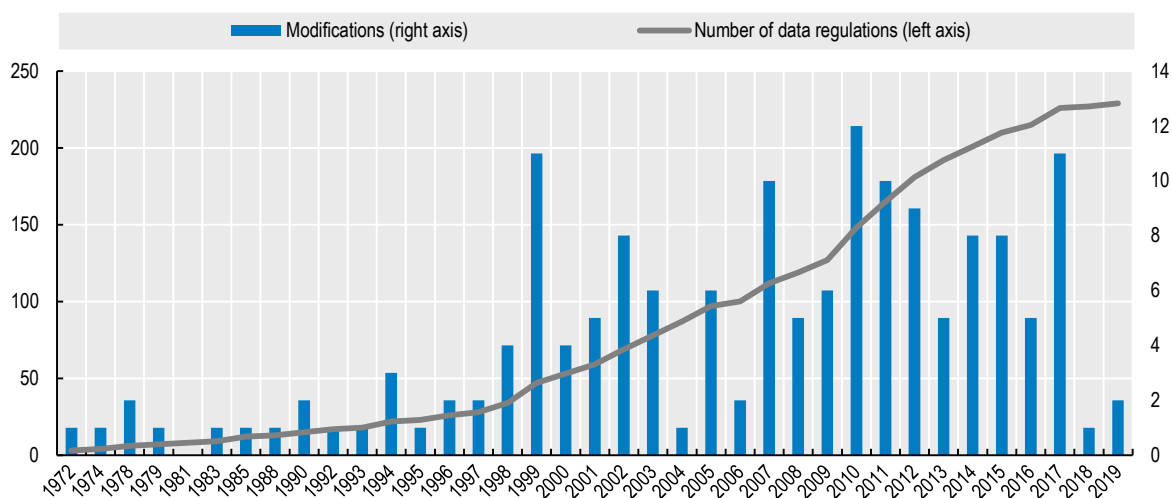
Note: Values show the impact of reducing digital trade restrictiveness, captured by a 0.1-point reduction of the DSTRI, on exports.

3.2. The number of regulations affecting data flows is growing

Economies and societies are more connected by data flows than ever before, underpinning how we socialise, produce, trade, and tackle global challenges (e.g. the COVID-19 pandemic or the green transition). However, cross-border data flows also raise, or exacerbate, challenges across different policy domains, including privacy and data protection, national security, regulatory reach, intellectual property protection, and trade. In response, governments have been adopting regulations which either condition the movement of data across borders or which mandate that data be stored domestically (Casalini and López González, 2019^[16]) (Figure 13).

A growing challenge is ensuring that, when data crosses an international border, it receives the desired degree of oversight and protection. This combination of enabling cross-border data transfers and ensuring that these take place in the context of trusted relationships has come to be known as *data free flows with trust* (DFFT).

Figure 13. A growing number of regulations affect cross-border data flows



Source: Casalini and López González (2019^[16]).

The regulatory landscape for cross-border data flows is fragmented

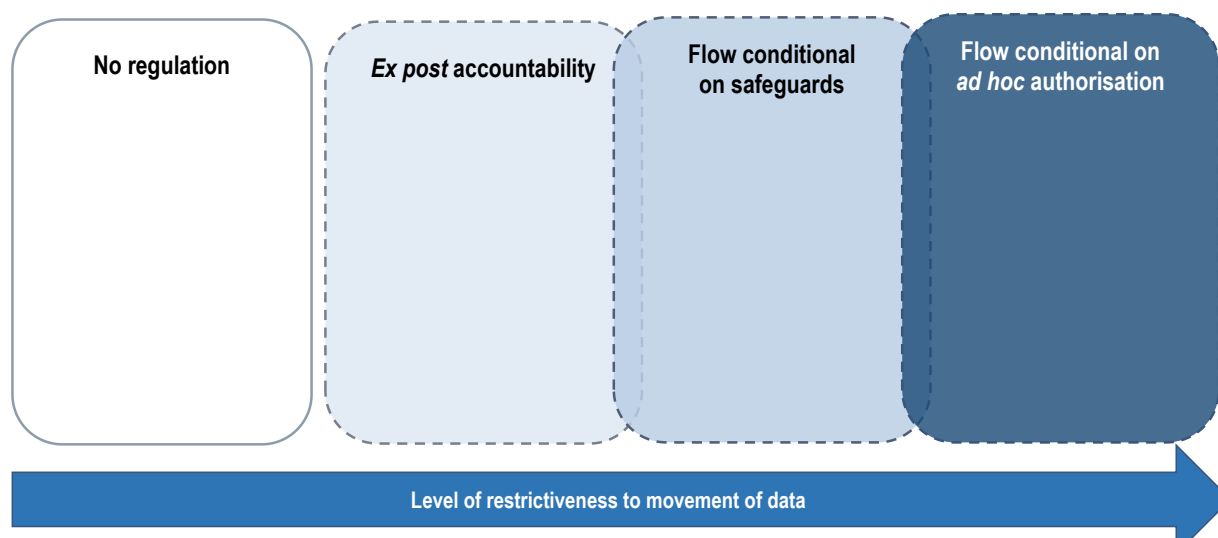
While approaches to regulating cross-border data flows vary, they can be broadly grouped into four categories (Figure 14). At one extreme, there is the **absence of cross-border data flow regulation**, usually because there is no data protection legislation at all (this is the case largely in least developed countries). While this implies no restrictions on the movement of data, the absence of regulations can affect the willingness of others to send data.

The second approach are **open safeguards**, which leave some discretion to the private sector as to how to safeguard the transfer of data. Examples of ‘open safeguards’ include private sector adequacy (where the data holder is accountable for having taken reasonable steps to ensure the adequacy of data protection in the transfer, including in the context of principles set out by the public sector).

A third approach conditions the flow of data on the existence of **‘pre-authorized’ safeguards**. The transfer of data abroad is usually permitted when a public body certifies that the regime of another jurisdiction meets a certain level of requirements (based on a set of transparent criteria), e.g. an “adequacy decision”. In the absence of such a decision, transfers can be made through the use of government sanctioned contractual clauses or binding corporate rules.

The last broad type of approach relates to systems that only allow data to be transferred on **ad hoc or case-by-case authorisation** and subject to a review and often discretionary approval by relevant authorities. This approach relates not only to personal data for privacy reasons, but to a more sweeping category of data referred to as “important data”, including in the context of national security.

Figure 14. There are different approaches to regulating cross-border data flows



Source: Casalini and López González (2019^[16]).

While there are legitimate reasons for growing data-flow regulation, and for diversity in this regulation, the multiplicity of applicable regimes is leading to an increasingly complex and fragmented regulatory landscape (see also OECD (2022^[17]), and Evenett and Fritz (2022^[18])). This is making it difficult not only to effectively enforce public policy goals such as privacy and data protection across different jurisdictions, but also for firms to operate across markets, affecting their ability to internationalise and benefit from operating on a global scale. The challenge for governments is to promote regulatory approaches that enable the movement of data while also ensuring that when data crosses a border that it receives the desired protection, safeguard and oversight.

Data localisation requirements are increasing in number and restrictiveness

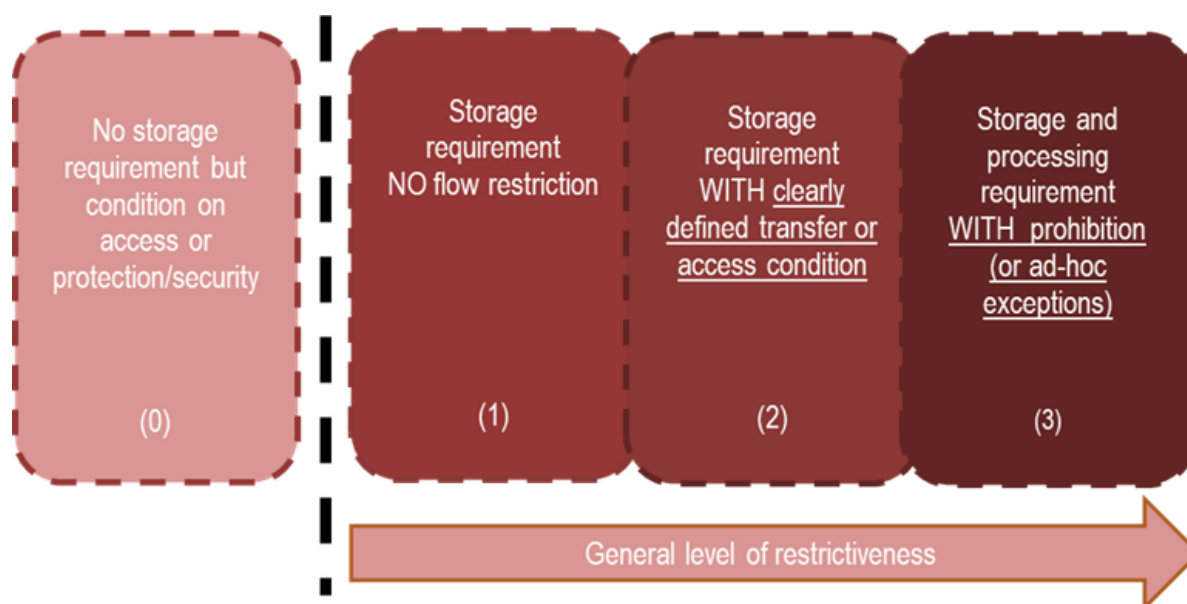
Closely related to data flow restrictions are local storage requirements. There is no single and widely accepted definition of data localisation. Although there is wide agreement that the consequence of data localisation is more local storage or processing, there are differing views as to what types of measures fall under the category of data localisation. In the present report, data localisation is defined as an *explicit requirement that data be stored and/or processed within the domestic territory* (Lopez-Gonzalez, Casalini and Porras, 2022^[19]) (OECD, forthcoming^[20]).

Overall, data localisation measures can be grouped into three broad, although not sharply delineated, categories (Figure 15).² These reflect the fact that data localisation requirements are often paired with different types of processing and/or flow restrictions. For instance, some approaches may require that health data be stored and processed locally and that it only be allowed to move out of the country provided that certain requirements are met.³

² Although presented as distinct, the boundaries between these categories can be blurry and even overlap.

³ At the extreme, a complete prohibition on the transfer of data amounts to a *de facto* requirement for local storage and processing. At the same time, a requirement that data be stored and processed only domestically can also correspond to a complete prohibition of cross-border transfer. It is worth recalling that, for the purposes of this report, only explicit requirements to store locally are taken into consideration.

Figure 15. Approaches to storage and processing requirements are diverse



Note: Figure is schematic; elements do not singularly identify any given country's approach to data localisation. Different approaches tend to apply to different types of data, even within a same jurisdiction.

Source: Adapted from López González, Casalini and Porras (2022^[19]).

The first category of approaches refers to **measures that require local storage of data, without prohibiting storage or processing in other countries** (Category 1). These measures are often applied in the context of ensuring that regulators do not encounter issues related to jurisdictional reach. To some extent, some of the emerging rules in this category can be considered as transpositions of analogue rules, such as enabling physical access to a firm's financial data for audit purposes, to the digital world.

The second category of measures are those that **require local storage and processing, but allow international access or transfers on the basis of clearly defined conditions** (Category 2). These are relatively new approaches that are largely being applied to health data. They contain localisation requirements but include language that helps identify the specific conditions under which a transfer would be allowed.

The third category of approaches refers to measures that **mandate local storage and processing of data while also prohibiting transfers to other countries** (or only on the basis of *ad hoc* authorisations) (Category 3). These more sweeping restrictions can apply to a range of data, including banking, telecommunications, or payment data, as well as to broader categories of information. They are often less transparent and more ambiguous in terms of the scope of application.

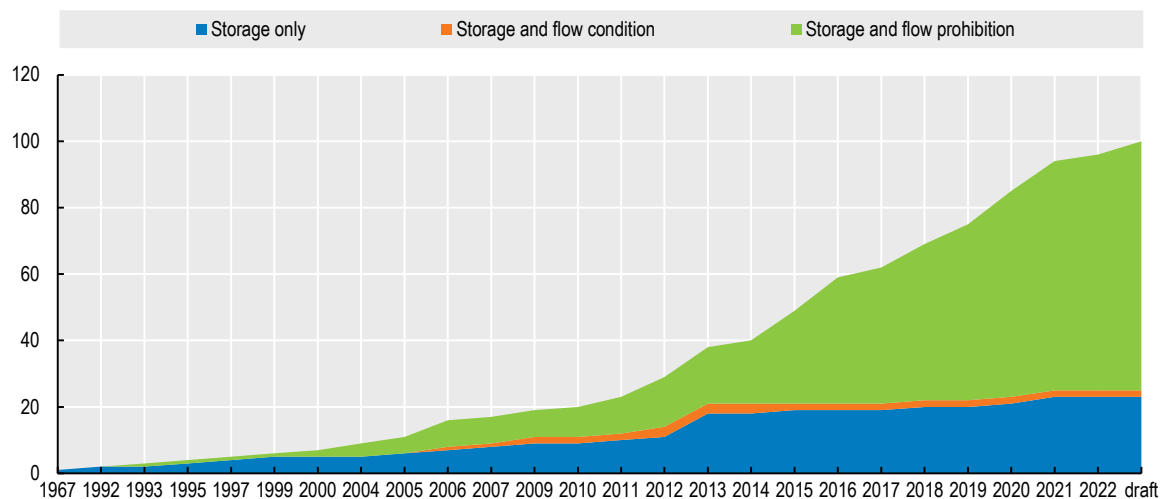
Outside this typology, a new category of approaches about access rather than location is emerging (Category 0). These are measures where there is **no requirement for data to be stored locally, but firms are required to guarantee access to data**.

The number of explicit data localisation measures has been increasing (Figure 16). By early 2023, there were 96 measures across 40 countries in place and four draft regulations (counting that three measures previously in place were revoked). Nearly half of the identified data localisation measures emerged after 2015. Importantly, the measures are becoming more restrictive; by early 2023, more than two-thirds of identified measures involved a storage requirement with a flow prohibition (Category 3).

Data localisation measures are more prevalent across non-OECD countries – around 70% of all measures (74 in total) — and are more restrictive. Overall, 55% of the measures applied by OECD countries involve

storage requirements only, while measures in non-OECD countries have storage requirements in which flow prohibitions dominate (91% of identified data localisation measures).

Figure 16. Data localisation is growing and becoming more restrictive



Note: Data localisation measures are defined as explicit requirements that data be stored or processed domestically. 'Draft' refers to regulations that have not entered into force but are in the process of doing so.

Source: Author's compilation based on own compilation including through the Digital Trade Alert, the OECD Digital STRI and Cory and Dascoli (2021^[21]).

4 International co-operation on digital trade is growing

While regulations may be national, the internet is global, and important efforts are also underway across a range of fora to find cooperative international approaches to foster digital trade. This section provides an overview of developments in international cooperation, including drawing on the most recent update of the OECD Digital Trade Inventory, highlighting available evidence on the benefits of such cooperation.

4.1. Discussions at the WTO on digital trade are progressing

Multilateral discussions on digital trade began in 1998 with the introduction of the work programme on e-commerce (WTO, 1998^[22]). That same year, WTO Members agreed on a Moratorium on applying customs duties on electronic transmissions (see the next section for a more in-depth discussion). However, progress on digital trade-related issues has been slow. It was not until December 2017 that a group of WTO Members agreed to “initiate exploratory work together toward future WTO negotiations on trade-related aspects of electronic commerce”.⁴

As of July 2023, this Joint Initiative (JI) on e-commerce comprises 89 Members and covers a range of issues, including facilitating electronic transactions through discussions on e-signatures and e-payments, in addition to issues such as paperless trade, data flows, privacy, consumer protection, cybersecurity, and market access. In a statement dated 28 July 2023, the co-chairs of the JI discussions (Australia, Japan, and Singapore) noted steady progress with a view to concluding negotiations by the end of 2023.⁵

4.2. At the same time, digital trade provisions in preferential trade agreements are increasing

Governance of digital trade-related issues has also migrated to bilateral and regional trade agreements. According to the Trade Agreements Provisions on Electronic-commerce and Data (TAPED) database (Burri and Polanco, 2020^[23]; Burri, Vasquez Callo-Müller and Kugler K., 2022^[24]), there were 116 agreements with digital trade or e-commerce provisions by June 2022, representing 33% of all existing agreements. Seventy-four of these agreements had a digital trade or e-commerce chapter, representing 21% of all existing agreements. Overall, since 2001 44% of agreements signed contain a digital trade or e-commerce provision (Figure 17).

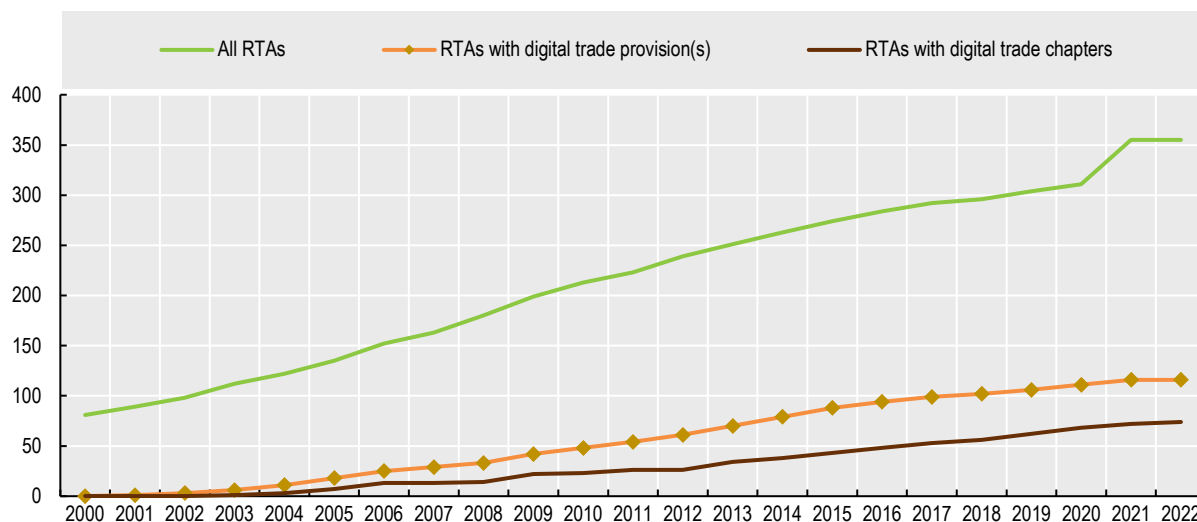
Digital trade provisions in regional trade agreements (RTAs) capture a wide array of issues important for digital trade in goods and services (Figure 18). These include a range of cross-cutting disciplines from digital trade facilitation (e.g. paperless trading, electronic authentication) to privacy and data protection,

⁴ See <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:WT/MIN17/60.pdf&Open=True>.

⁵ See https://www.wto.org/english/news_e/news23_e/igo_20jan23_e.pdf, 20 January 2023 and https://www.wto.org/english/news_e/news23_e/ecom_28jul23_e.htm, 28 July 2023.

consumer protection, source code, customs duties on electronic transmissions and cybersecurity. Countries participating in the WTO JI discussions also tend to have more comprehensive coverage of digital issues in their preferential trade agreements.

Figure 17. A growing number of RTAs have digital trade provisions

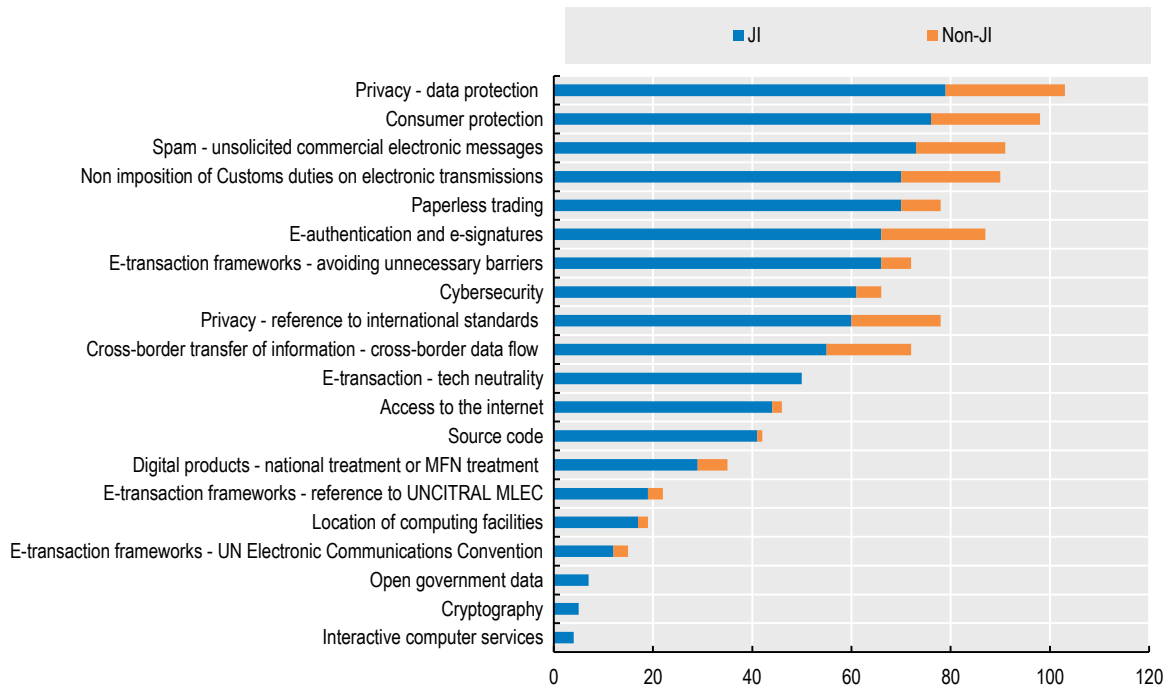


Note: Analysis only considers trade agreements in force in a respective year. RTA with digital trade provisions refers to there being at least one e-commerce/digital trade provision, whether in a separate chapter or not (e.g. IP provisions which might be important for the digital economy but are not in an individual e-commerce chapter). RTAs are identified from the WTO RTA database. Digital provisions and digital chapters are identified from the TAPED database (November 2022 version).

Source: López González, Sorescu and Kaynak (2023^[12]).

Figure 18. RTAs cover a wide range of digital trade issues

Number of jurisdictions and coverage of issues in RTAs



Note: Figure identifies number of countries with different digital trade provisions in their RTAs according to whether they are participating in the Joint Initiative (JI) on e-commerce or not.

Source: Nemoto and López González (2021^[25]).

The impact of e-commerce chapters in RTAs on trade is positive for both high-income and emerging economies. Indeed, signing an RTA with an e-commerce provision is found to increase exports of high-income countries by 10.3%, nearly twice as much as a shallow agreement (i.e. an agreement without an e-commerce chapter), and exports of emerging economies increase by 16.9% (López-Gonzalez, Sorescu and Kaynak, 2023^[12]). However, the relationship between e-commerce chapters and trade depends strongly on the depth of the e-commerce provisions signed. More work is needed to tease out their impact on countries at different levels of development.

4.3. New digital economy agreements are emerging

In parallel, countries are increasingly concluding broader Digital Economy Agreements (DEAs), such as the Digital Economy Partnership Agreement (DEPA) between New Zealand, Singapore and Chile,⁶ and the DEA between Australia and Singapore. In addition to disciplines covered in RTAs, these agreements incorporate provisions on new disciplines such as artificial intelligence, digital identity, and open

⁶ In June 2023, Korea announced its accession to DEPA:

https://english.motie.go.kr/en/pc/pressreleases/bbs/bbsView.do?bbs_cd_n=2&bbs_seq_n=1318.

government data, among others. Interest in these agreements is rising, as seen with the signing of new DEAs⁷ and the expanding membership in existing ones (e.g. the DEPA).⁸

4.4. Digital trade discussions are now taking place in a range of fora

In addition to the Joint Initiative on e-commerce at the WTO, RTAs and DEAs, issues related to digital trade are also being discussed in various international fora, such as UNCITRAL, UNECE/UNCEFACT, OECD and, in addition, in regional fora, including APEC, ASEAN, ESCWA, ECOWAS. The OECD Digital Trade Inventory (DTI) (Nemoto and López González, 2021^[26]) Box 3) shows international progress on the measures and disciplines relevant to the WTO Joint Initiative on e-commerce.

Box 3. The Digital Trade Inventory

The OECD Digital Trade Inventory (Nemoto and López González, 2021^[25]) maps the range of international rules, principles and standards relevant for discussions on digital trade. The Digital Trade Inventory maps countries' overall engagement in 35 international instruments introduced in different international fora (listed in Nemoto and López González (2021^[25]), based on the policy framework that underpins the discussions in the JI on e-commerce at the WTO as of December 2022 (Ismail, 2023^[27]):

- A. **Enabling** e-commerce: electronic transaction frameworks, electronic authentication and electronic signatures, electronic contracts, electronic invoicing, and paperless trading.
- B. **Openness** and e-commerce: customs duties on electronic transmissions, open government data, access to and use of the internet for electronic commerce/digital trade.
- C. **Trust** and e-commerce: online consumer protection, unsolicited commercial electronic messages, personal information protection/personal data protection, source code, ICT products that use cryptography, and cybersecurity.
- D. **Cross-cutting** issues: cross border transfer of information by electronic means/cross-border data flows, and location of computing facilities.
- E. **Telecommunications**: disciplines related to telecommunication services.
- F. **Other**: logistics services, use of technology for trade facilitation, domestic regulation, entry of business persons or issues of goods and services market access.

To enable interpretation, a very preliminary summary of progress across the measures covered by the DTI is provided. The DTI covers 193 economies (WTO Members, and WTO observers and non-observers) over the period 2000-2023.

A summary measure of the DTI, ranging from zero to one, provides a measure of progress in discussions on digital trade issues.⁹ It highlights the growing adoption of international instruments related to e-commerce, in particular with respect to enabling e-commerce (including UNCITRAL model law

⁷ Recent examples include the Digital Trade Agreement between the United Kingdom and Ukraine in November 2022 and the Korea-Singapore Digital Partnership Agreement (KSDPA) that entered into force in January 2023.

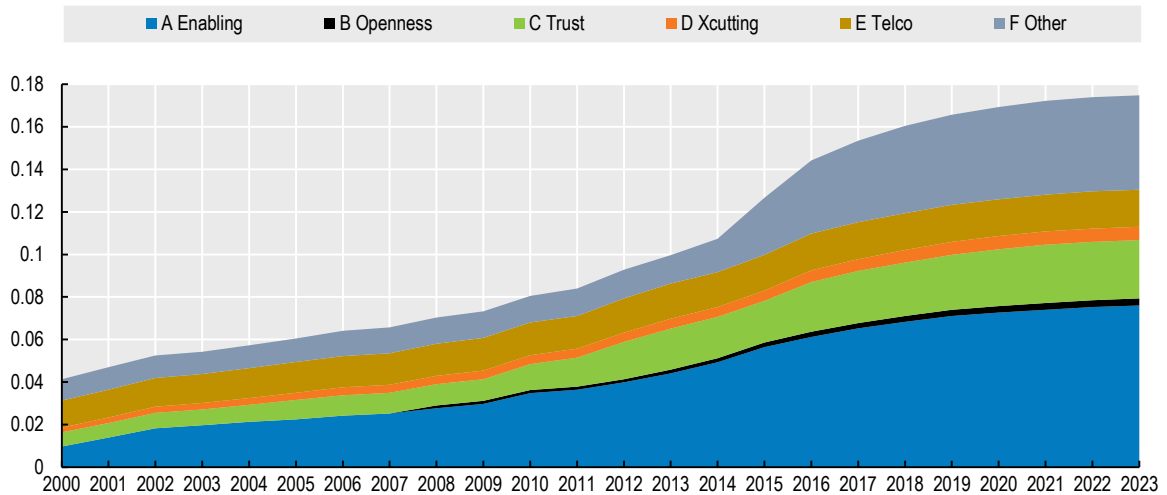
⁸ On 18 August 2022, the DEPA Parties established a Working Group for China to begin DEPA accession negotiations. A similar group was established on 24 August 2022 for Canada.

⁹ The summary of 1 in DTI reflects a context where economies adopt multilateral and binding international instruments in all policy areas covered.

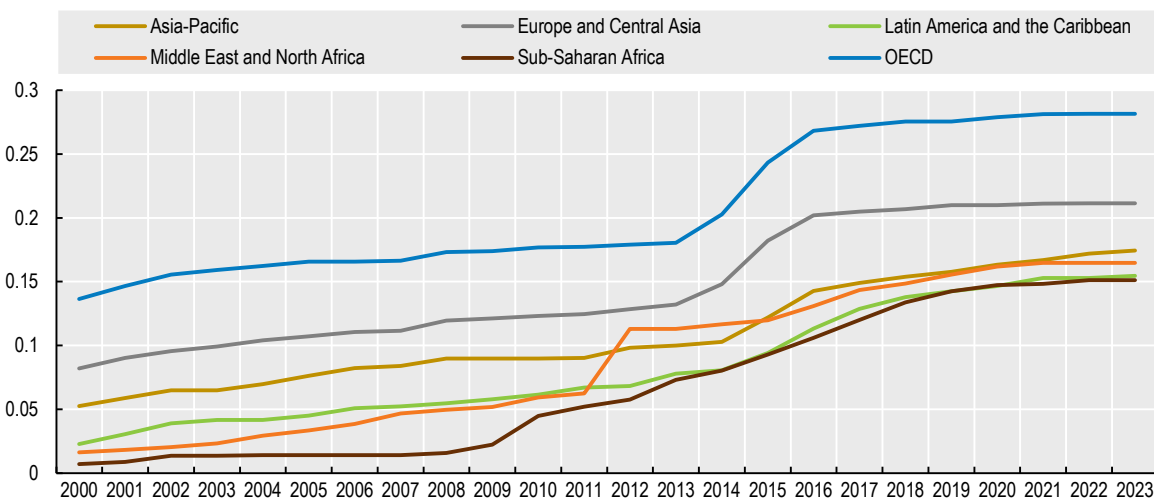
instruments) and the broader category of ‘other’ disciplines (which includes logistics services or use of technology for trade facilitation) (Figure 19). It shows the wide heterogeneities across regions; while OECD are at the forefront of adoption, African countries are also adherents to many international instruments.

Figure 19. Countries are increasingly adopting international instruments related to digital trade

A. Broad categories covered by the DTI, 2000-2023



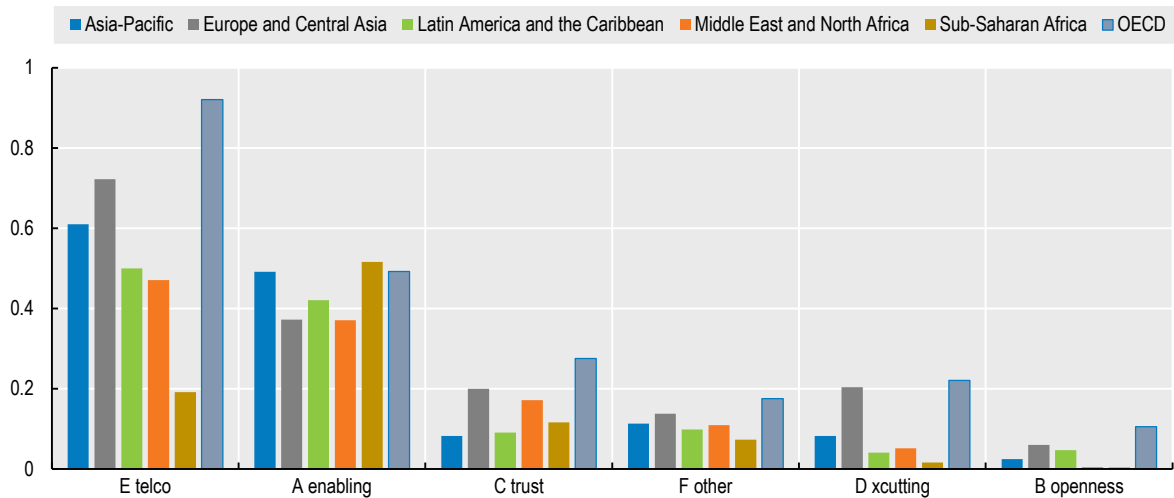
B. Summary of DTI by region, 2000-2023



Source: Based on Nemoto and López González (2021^[26]).

In terms of issues, most progress has been made in telecommunications and the enabling environment for e-commerce. Progress has been slower in other areas, including *trust* (which reflects issues such as privacy or consumer protection), or on *cross-cutting issues* such as cross-border data flows (Figure 20). In 2023, OECD countries had made good progress across all policy areas, in particular telecommunications. Strong progress had also been made in the Sub-Saharan African region, especially in the area of enabling e-commerce thanks to adherence to specific regional instruments.

Figure 20. Progress in international discussions is uneven



Note: The figure shows the progress that has been achieved by policy area across regions out of all policy measures covered by the DTI.
 Source: Based on Nemoto and López González (2021^[26]).

5 There is a strong case to renew the e-commerce Moratorium

5.1. The e-commerce Moratorium is up for renewal at MC13

For more than two decades, the WTO Moratorium on applying customs duties on electronic transmissions (henceforth the “Moratorium”), the only WTO provision that applies explicitly to digital trade, has supported a stable, predictable and duty-free environment for digital trade to thrive. However, in recent years, the opportunity costs of the Moratorium have been questioned by several WTO Members.¹⁰ Their concerns range from a lack of clarity on the scope of the Moratorium and definition of electronic transmissions to the potential foregone customs revenue, and the desire to maintain “policy space” in light of rapid technological change.

These discussions are not new. Issues around the scope and impact of the Moratorium have been debated for nearly 25 years. However, during its latest renewal, at the 12th Ministerial Conference in June 2022 (MC12), WTO Members agreed to *intensify discussions* on the Moratorium, including on its *scope, definition, and impact*, underscoring the need for renewed evidence to inform this debate. At the upcoming WTO Ministerial Conference (MC13), to take place in February 2024, WTO Members will, once again, discuss whether or not to renew this Moratorium.

5.2. Language in RTAs can provide guidance on issues of scope and definition

Identifying how countries have approached customs duties on electronic transmissions in their trade agreements can provide useful information about the possible contours of WTO Members’ understanding of the Moratorium. This can help provide greater clarity and transparency to the ongoing discussions about the scope of the Moratorium and the definition of electronic transmissions.

Provisions on the non-imposition of customs duties on electronic transmissions (NICDET provisions) are some of the most common elements in e-commerce chapters. Of the current 105 signed agreements with an e-commerce chapter, 100 include a NICDET provision (Andrenelli and López González, forthcoming^[13]).

- **The majority of agreements (88 of 100) do not tie NICDET provisions to the outcome of the WTO E-commerce Work Programme.** This means they would remain in place should the Moratorium lapse.
- **There is widespread understanding that the Moratorium does not apply to internal non-discriminatory taxation** and that it implies **narrow commitments on customs duties with no incidence on the wider regulation of the electronic delivery of services** (GATS or RTA commitments and flexibilities remain).

¹⁰ See [WT/GC/W/747](#) and [WT/GC/W/798](#).

- **Recent agreements clarify that commitments apply to content.** No agreement clarifies that commitment applies to ‘carrier medium’.
- While there are differing approaches as to whether commitments apply to ‘digital products’ or services, **countries have used flexible language to accommodate different understandings of electronic transmissions in the RTAs.**

5.3. The potential fiscal implications of the Moratorium are small and would likely be offset by VAT/GST revenue

Questions around the potential fiscal implications of the e-commerce Moratorium have existed since it was signed in 1998. Chief amongst concerns has been that the digitalisation of goods such as cassettes, videotapes, CDs, DVDs, books, calendars, and other digitisable goods would deprive WTO Members, particularly developing countries, of an important source on which customs duties are collected.

These concerns have led to several empirical contributions producing wide-ranging estimates on the potential ‘foregone’ revenue associated with the Moratorium. These range between USD 280 million and USD 14.3 billion, depending on the trade flows covered and the tariffs applied (i.e. whether effectively applied, MFN, or bound rates). However, as shown in Andrenelli and López González (2019^[7]) and Evenett (2021^[28]), these estimates represent a small share of overall government revenue, a finding confirmed by case study evidence on Egypt and Viet Nam (Köhler-Suzuki, 2020^[29]).

A caveat with existing estimates is the failure to take into account existing commitments that affect the ability of countries to raise tariffs on digitisable goods and electronic transmissions, even in the absence of the e-commerce Moratorium.¹¹ When these are taken into account, the potential foregone customs revenue for 171 countries is USD 1.3 billion, which represents a country average of 0.68% of potential total customs revenue lost (Table 1). As a share of government revenue, and for a sample of 131 countries, the income group average is between 0.01% and 0.33% of overall government revenue.

Table 1. The potential foregone customs revenue from the Moratorium is small

By income group and share of potential overall customs revenue (171 countries) and overall government revenue (131 countries), 2021 or latest available year

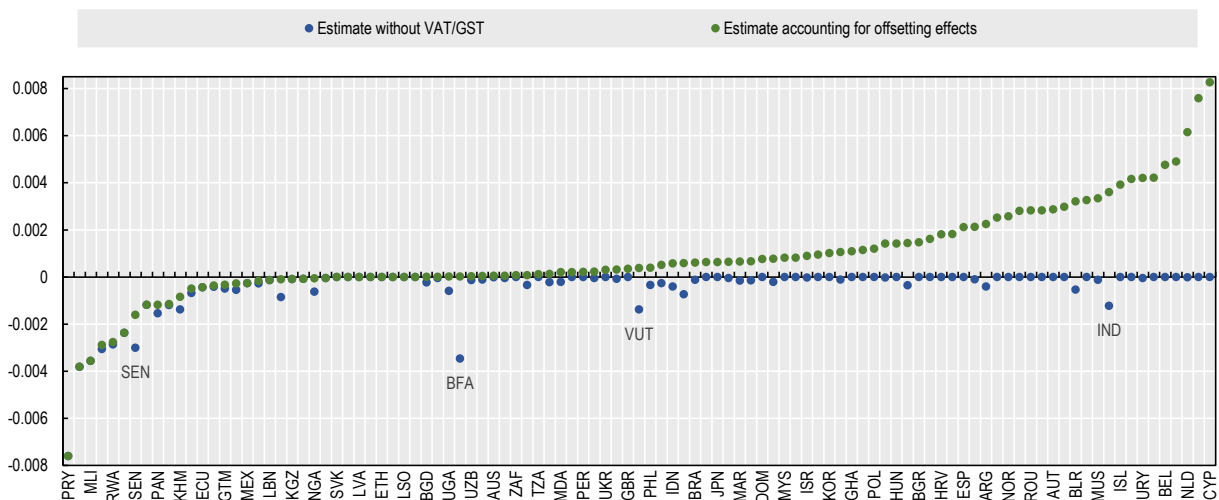
	Average MFN tariff	Average share of imports that is dutiable	Sum of potential foregone revenue (USD million, 171 countries)	Average share of foregone revenue in potential customs revenue (171 countries)	Average share of foregone revenue in total government revenue (131 countries)
Low income	10.3%	87%	60	1.64%	0.33%
Lower middle income	9.0%	72%	738	1.09%	0.20%
Upper middle income	5.7%	60%	256	0.40%	0.06%
High income	1.9%	53%	205	0.22%	0.01%
All countries	5.9%	64%	1,265	0.68%	0.10%

Source: Andrenelli and López González (forthcoming^[13]) based on BACI, TAPED and TRAINS.

¹¹ They do not consider: i) preferences granted in FTAs to digitisable goods; ii) NICDET provisions not tied to the Moratorium; iii) Customs valuation practices, including in FTAs and at the WTO (i.e. Customs Valuation decision 4.1); and iv) the expansion of the Information Technology Agreement (ITA).

Furthermore, few studies have examined how other taxes, such as non-discriminatory consumption taxes, could offset potential revenue losses from customs duties.¹² An analysis of the potential offsetting effects of VAT/GST shows that for 77 of the 106 countries for which data is available, standard VAT/GST rates applied to imports of ‘born digital’ services are likely to generate more revenue than the foregone customs revenue attributable to the e-commerce Moratorium (Figure 21). Where these taxes might not fully offset the potential impact of the Moratorium, in most cases they would attenuate the fiscal implications of the dematerialisation of trade.

Figure 21. Standard VAT/GST taxes applied on digital services imports can offset the fiscal revenue effects of the Moratorium



Note: The figure shows the net impact of VAT/GST revenue from digital services imports minus foregone customs revenue from the e-commerce Moratorium, as a share of total government revenue.

Source: Andrenelli and López González (forthcoming^[13]) based on BACI, UNCTAD-WTO trade in services statistics, TRAINS, PwC, Avalara, KPMG, World Development Indicators and OECD Tax Revenue Statistics.

These findings underscore the potential to find fiscal solutions, based on consumption taxes, to collect revenue on immaterial imports based on widely adopted and internationally accepted standards. These have the potential to not only address tax challenges associated with the digital transformation but also a demonstrated capacity to increase tax revenues. Nor do they present shortcomings specific to customs duties, such as detailed product classification (standard VAT/GST rates typically apply to digital deliveries) or the determination of origin (VATs/GSTs apply at the place of final consumption regardless of the place of origin).

5.4. The Moratorium matters for the most vulnerable

A full picture of the impact of the Moratorium requires looking beyond the fiscal implications and identifying the potential costs associated with its lapse (Andrenelli and López González, forthcoming^[13]).

A predictable and duty-free environment is associated with more trade. Increases in trade policy uncertainty, measured as a one percentage point change in the water in the tariff, lead to reductions in trade in digitisable goods of around 0.17-0.2%. The impact is higher for low-income and middle-income

¹² A notable exception is Lee-Makiyama and Narayanan (2019^[33]).

countries. Not renewing the moratorium is likely to result in this policy uncertainty affecting trade via electronic transmissions.

Lifting the Moratorium would hit low-income country trade the most. Applying existing tariffs on digitisable goods to digital services, where electronic transmissions are measured in existing trade statistics, would lead to reductions in imports and exports of low-income countries of 32% and 2.5% respectively. For middle-income countries, losses would be of 6% and 0.4%, and losses for high-income countries would be 0.04% and 0.5%. In terms of trade effects, developing countries would suffer the most.

Tariffs on electronic transmissions would reduce domestic competitiveness. Imports of digital services and digitisable goods are associated with increases in the domestic value added in output across countries at all levels of development. Tariffs on these would increase input costs, leading to lower domestic and international competitiveness for countries at all levels of development.

Smaller and women-owned firms could be the most impacted from tariffs on electronic transmissions. Smaller firms and women-owned SMEs rely on digital tools, including digital transmissions, to reach distant customers via exports (Figure 3). Analysis shows that smaller firms that use digital tools are more productive and employ more people than those that do not. The most vulnerable actors will likely be the biggest losers from the lapse of the Moratorium.

Box 4. The rise in 3D printing is unlikely to lead to strong fiscal losses

It has been argued that the fiscal implications of the Moratorium will be exacerbated by the rise in new technologies, such as 3D printing, which could lead to the substitution of physical trade by electronic transmissions (Banga and Kozul-Wright, 2020^[30]). However, where the technology has found widespread application, such as in the hearing aids industry, it has resulted in more, and not less, international trade in goods (Freund, Mulabdic and Ruta, 2019^[31]). Recent evidence also suggests there is a positive relationship between imports of 3D printers and trade in a wide range of 3D printable items, including orthopaedic appliances, aircraft parts, medications, and machine parts (Andrenelli and López González, 2021^[32]). This suggests that the wider adoption of 3D printing is likely to lead to more trade in goods, at least in the short to medium term, meaning that the wider adoption of 3D printing is unlikely to result in foregone tariff revenue.

5.5. There is a strong case for renewing the Moratorium

WTO Members should take into consideration the wider benefits of the Moratorium in discussions for its renewal, and not focus solely on the potential customs revenue implications. Analysis shows that the revenue implications of the Moratorium are likely to be small relative to overall government budgets, and that its lapse would come at the expense of wider gains in the economy, including in terms of consumer welfare and export competitiveness. Moreover, new technologies such as 3D printing are unlikely to have wider implications for the Moratorium, at least in the foreseeable future.

6 Getting digital trade policies right has never been more important

Digital trade promises new opportunities for firms of all sizes, across all sectors of the economy and in countries at all levels of development, but it also raises new challenges. Although increasingly tight domestic regulation, including in the context of data flows, is resulting in growing digital fragmentation, there is a parallel push towards greater regulatory cooperation at the international level.

In today's increasingly digitalised and globally interconnected world, such cooperation is needed not only to enable new opportunities but also to meet emerging challenges. The internet is global and borderless, but regulations are not. To make digital trade work for all, increased regulatory cooperation is needed. This implies not only finalising discussions under the WTO JI on e-commerce, but also continuing to expand and deepen digital trade provisions in RTAs and engaging in wider discussion under emerging digital economy agreements. It also implies maintaining existing WTO provisions that have ensured a stable, predictable and duty-free environment for digital trade to thrive as is the case of the e-commerce Moratorium.

This report has aimed to give a brief overview of the evidence of gains from digital trade, and of developments in cooperation to facilitate those gains, drawing on the latest OECD analysis and updates of the OECD digital toolkit for policymakers, the OECD DSTRI, the STRI and the Digital Trade Inventory. It aims to support governments in thinking through how best to ensure that digital trade can work for all.

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