

Unclassified**English - Or. English**

26 September 2023

**TRADE AND AGRICULTURE DIRECTORATE
TRADE COMMITTEE****Working Party of the Trade Committee****Understanding the potential scope, definition and impact of the WTO
e-commerce Moratorium**

Purpose: This paper has been declassified by written procedure in September 2023.

Preparation: This draft was prepared by Andrea Andrenelli and Javier Lopez Gonzalez of the Trade Policy Division. It incorporates comments from Cemre Balaban, Chiara Del Giovane, Janos Ferencz, Matteo Fiorini, Marion Jansen, Julia Nielson, Silvia Sorescu and Enxhi Tresa from TAD and Antonella Liberatore, Annabelle Mourougane and Julia Schmidt from SDD. It also benefitted from inputs from Piet Battiau and Eduardo Jimenez (CTP).

Background: The work is foreseen under Output Area 3.1.1.2.2 (Impacts and opportunities of digital trade) of the 2023-24 PWB.

Andrea Andrenelli (andrea.andrenelli@oecd.org)

Javier Lopez-Gonzalez (javier.lopezgonzalez@oecd.org)

JT03527215

Table of contents

1. Introduction	6
2. What do we know about the e-commerce Moratorium?	7
2.1. What is the e-commerce Moratorium?.....	7
2.2. What are the grey areas of the e-commerce Moratorium?.....	8
3. What can be learnt about the potential scope of the e-commerce Moratorium from Regional Trade Agreements?	9
3.1. NICTED provisions are widespread and growing	9
3.2. NICDET provisions can shed light on Members' approaches to electronic transmissions	11
3.3. NICDET provisions have been agreed by countries at different levels of development	14
3.4. Countries have found ways to accommodate different understandings of electronic transmissions.....	15
4. What insights can be gleaned from international trade data?	17
4.1. Imports of digitisable goods are slowing, but this is largely a high-income country phenomenon.....	18
4.2. Digital services imports grew significantly across all income groups.....	21
5. Assessing the potential fiscal implications of the e-commerce Moratorium	23
5.1. Calculating the customs revenue implications of the Moratorium	24
5.2. Potential revenue losses can be offset from rising VAT and GST takings.....	33
6. Identifying the potential implications of not renewing the Moratorium.....	40
6.1. Trade policy uncertainty reduces trade	40
6.2. Lifting the Moratorium would hit low-income country trade most	42
6.3. Tariffs on electronic transmissions would reduce domestic competitiveness	44
6.4. Smaller and women owned firms could be most impacted from tariffs on electronic transmissions.....	45
7. Policy observations	48
References	49
Annex A. NICDET provisions in RTAs.....	53
Annex B. Separating the carrier and content elements of physical transactions involving digital storage devices; list of digitisable goods.....	55
Annex C. Fiscal implications of the Moratorium – commitments and practices.....	60
Annex D. Benefits of the Moratorium	63

FIGURES

Figure 1. NICDET provisions are present in nearly all existing e-commerce chapters in RTAs	9
Figure 2. The evolution of NICDET provisions in Regional Trade Agreements	13
Figure 3. NICDET commitments across signatories at different levels of development	14
Figure 4. Approaches to the definition of electronic transmissions in NICDET provisions	16
Figure 5. High-income countries account for the lion's share of world imports of digitisable goods	19
Figure 6. Imports of digitisable goods have been growing in developing countries over the last decade	20

Figure 7. The composition of digitisable goods imports varies across income groups	21
Figure 8. Digital services imports have been growing across most sectors (1987-2021)	22
Figure 9. Digital services imports have grown across all income groups in the past decade	23
Figure 10. Other commitments and practices cover a significant share of imports of digitisable goods	28
Figure 11. On average, 80% of the value of trade in recorded optical media reflects ‘content’	29
Figure 12. Hypothetical tax base for customs duties on electronic transmissions	30
Figure 13. Estimating the benefits of consumption taxes on trade that is ‘born digital’	34
Figure 14. Distribution of standard VAT rates and final demand shares	36
Figure 15. Standard VAT/GST taxes applied on digital services imports would offset in most countries the fiscal revenue effects of the Moratorium	38
Figure 16. Trade policy uncertainty reduces trade in digitisable goods	41
Figure 17. Tariffs on digital services would reduce trade significantly, especially in low-income countries	43
Figure 18. Digital inputs are key determinants of domestic competitiveness	45
Figure 19. Smaller firms benefit more from digital deliveries than larger firms	46
Figure 20. Women owned SMEs benefit more from use of digital tools than male owned SMEs	47
Figure 21. Digitalisation is associated with more employment, including for women	47

TABLES

Table 1. Estimates of revenue implications of the Moratorium in perspective	25
Table 2. Potential foregone customs revenue	32
Table 3. Trade in digital services by income level	43

BOXES

Box 1. NICDET provisions in RTAs take diverse forms	10
Box 2. For measurement purposes, statistical manuals record transactions involving ‘content’ in the trade in services account	18
Box 3. Empirical evidence on the customs revenue implications of the Moratorium	25
Box 4. Methodology to quantifying the incidence of customs valuation practices and ITA commitments for imports of digitisable goods	28
Box 5. Addressing the VAT Challenges of Digital Trade: delivering an effective global solution	38

Summary

At MC12, WTO Members agreed to intensify discussions on the *scope, definition and impact* of the e-commerce Moratorium. This paper aims to contribute some clarity and new empirical evidence to these discussions in the run-up to MC13.

Much can be learnt about the potential scope of the moratorium and definitions of electronic transmissions from existing provisions on the non-imposition of customs duties on electronic transmissions (NICDET provisions) in Regional Trade Agreements (RTAs).

- **Nearly all existing digital trade chapters in RTAs, 95%, contain a NICDET provision – signed by a total of 102 countries.** Eighty-five percent of these commitments, involving 33 developing countries, would remain in place should the Moratorium lapse.
- There is widespread understanding in these agreements 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).
- Countries have found ways to **accommodate different understandings of electronic transmissions** in their RTAs.

Estimates of the potential fiscal implications of the Moratorium suggest that potential customs revenue losses, including from replacement of trade in ‘digitisable goods’ with their digital equivalent, would be small and could be offset through VAT/GST revenue.

- For many countries, particularly at lower levels of development, imports of ‘digitisable goods’ have grown and continue to generate tariff revenue.
- The share of trade that would be ‘dutiable’ should the Moratorium lapse is, on average, 67% of digitisable goods imports (with differences across income levels). Existing commitments, including in RTAs, NICDET provisions and customs valuation practices affect the ability of countries to levy tariffs on digitisable goods and electronic transmissions even in the absence of the Moratorium.
- The overall revenue implications of the Moratorium are small. The potential foregone customs revenue that could be attributed to the Moratorium is USD 1,3 billion. This represents an average of 0.68% of potential total customs revenue or around 0.1% of overall government revenue.
- For 77 out of 106 countries for which data is available, potential foregone revenue would be completely offset by rising revenue from VAT/GST on digital services imports which are ‘born digital’.

A full picture of the impact of the Moratorium requires looking beyond the fiscal implications and identifying the potential benefits of the Moratorium or the costs associated with its lapse:

- **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%. Impacts are higher for low-income and middle-income countries. Not renewing the Moratorium could mean that this policy uncertainty would impact electronic transmissions.

- **Tariffs on electronic transmissions 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 6% and 0.4% respectively and for high-income countries 0.04% and 0.5%. In terms of trade effects, developing countries would suffer most from lifting the Moratorium.
- **Tariffs on electronic transmissions would reduce domestic competitiveness.** Imports of digital services and digitisable goods are associated with increases in domestic value added in output across countries at all levels of development. Tariffs on these would increase input costs limiting the capacity for domestic value addition, reducing domestic and international competitiveness for countries at all levels of development.
- **Smaller and women-owned firms could be most impacted from tariffs on electronic transmissions.** Smaller firms and women-owned SMEs particularly rely on digital tools, including digital transmissions, to reach distant customers via exports. Moreover, analysis shows that smaller firms that use digital tools, including webpages, are more productive and employ more people than those that do not. The Moratorium thus matters for inclusive trade.

1. Introduction

For more than two decades, the WTO Moratorium on applying customs duties on electronic transmissions (henceforth the Moratorium) has supported a stable and predictable environment for digital trade to thrive. However, in recent years, the opportunity costs of the Moratorium have been questioned by several WTO Members.¹ Their concerns range from: the lack of clarity on the scope of the Moratorium and the 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 held in Geneva 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.

Against this backdrop, and building on past OECD contributions (Andrenelli and López González, 2019^[1]; 2021^[2]; OECD, 2022^[3]), showing that the benefits of the Moratorium outweigh the costs, this paper aims to support discussions in the run up to MC13 by bringing greater clarity to some of the issues at stake, focusing on what can be learnt from existing evidence about the potential scope, definition and impact of the Moratorium and presenting new empirical evidence on the customs revenue implications of its lapse.

To this end, the paper is organised as follows. The next section provides an overview of what is known about the e-commerce Moratorium and the existing grey areas. Section 3 looks at commitments made by WTO Members in their regional trade agreements (RTAs) with a view to providing greater clarity on the potential contours of the scope of the Moratorium and existing definitions of electronic transmissions. Section 4 maps emerging trends across different categories of trade that are relevant for discussions on electronic transmissions. Section 5 analyses the fiscal implications of the Moratorium, providing new estimates of the potential customs revenue implications and the potential offsetting effects arising from growing revenue from other non-discriminatory taxes. Section 6 provides an analysis of the potential benefits of the Moratorium and the potential costs associated with its lapse and Section 7 discusses some policy observations.

This work also has also led to the preparation of a statistical companion, summarising, on a country-by-country basis, data that are relevant to discussions on the Moratorium. The aim, beyond a transparency exercise, is to highlight the strong heterogeneities identified and enable more informed policy discussions. This will be made available to Delegates via the Trade Portal and could be made available more widely.

This work does not seek to pre-judge WTO Members’ views on what the Moratorium does or does not cover nor to interpret the commitments countries have or have not made. Rather, it seeks to increase the evidence base with a view to supporting discussions on the *scope, definition and impact* of the Moratorium in the run up to WTO MC13.

¹ See [WT/GC/W/747](#) and [WT/GC/W/798](#).

2. What do we know about the e-commerce Moratorium?

The e-commerce Moratorium has been the subject of longstanding debate at the WTO.² More recently, in discussions on the renewal of the Moratorium, India, Indonesia and South Africa have voiced concerns about the opportunity costs associated with its extension (WTO, 2021^[4]; WTO, 2022^[5]). This has re-ignited debates about the scope of the Moratorium and its potential economic implications, underscoring the need for greater understanding of what the Moratorium is, and where ambiguities remain.

2.1. What is the e-commerce Moratorium?

Since 1998, WTO Members have regularly extended a Moratorium on applying customs duties on electronic transmissions. The original Ministerial Declaration, which also saw the creation of the Work Programme on Electronic Commerce, contained a simple commitment which has come to be known as the e-commerce Moratorium:³

Members will continue their current practice of not imposing customs duties on electronic transmissions.

This language has been replicated in subsequent WTO Ministerial Declarations, most recently at MC12 in Geneva in June 2022. However, given concerns expressed by some Members, WTO Members agreed to preface the renewal of the Moratorium with a commitment to intensify discussions on its *scope, definition and impact*.⁴ The relevant section of the Declaration at MC 12 reads as follows:

*We shall intensify discussions on the moratorium and instruct the General Council to hold periodic reviews based on the reports that may be submitted by relevant WTO bodies, including on **scope, definition, and impact** of the moratorium on customs duties on electronic transmissions.*

***We agree to maintain the current practice of not imposing customs duties on electronic transmissions** until MC13, which should ordinarily be held by 31 December 2023. Should MC13 be delayed beyond 31 March 2024, the moratorium will expire on that date unless Ministers or the General Council take a decision to extend.*

In understanding the *scope, definition and impact* of the Moratorium, it is useful to decompose this section of the e-commerce Declaration into its constituent elements, separating the unambiguous parts from those where ambiguities may remain. The e-commerce Moratorium begins with an agreement *to maintain [a] current practice*. It does not impose positive obligations or commitments to change course of action, only to continue existing conditions. Those conditions are of *not imposing customs duties*, that is, tariffs which are collected on goods trade (and not other taxes). However, this commitment applies to *electronic transmissions*, a category of trade which has not been defined.

Flexibility around the definition of electronic transmissions is likely to have played a role in enabling the adoption of the Moratorium in the first place. This flexibility has also avoided a number of difficult questions, including whether electronic transmissions should

² See the summary of WTO dedicated discussions on E-commerce in Annex A.

³ With an additional commitment to reinvigorate the WTO E-commerce Work Programme, including its development dimensions (WTO, 2022^[54]) see [T/MIN\(98\)/DEC/2](#).

⁴ As well as providing more clarity on the validity of the Moratorium in case a future WTO Ministerial is postponed.

be treated as goods or as services, an issue that remains contentious to this day. This has preserved a stable and duty-free environment that has enabled digital trade to thrive (WTO, 2023_[6]).⁵ However, this has also left room for different interpretations about what items countries may have agreed not to charge tariffs on. Opening the debate on the scope of the Moratorium and the definition of electronic transmissions also means opening the debate on a range of difficult issues.

2.2. What are the grey areas of the e-commerce Moratorium?

Soon after the adoption of the Moratorium, a lively debate among WTO Members on its scope began (Annex A provides a more detailed summary of this debate). Discussions highlighted a range of common views but also divergences on the scope of the Moratorium and the definition of electronic transmissions. They consist of:

- **Whether electronic transmissions should be treated as goods or as services.** In particular, there is ambiguity about products such as films, videogames, music or software which can be digitally delivered or delivered through a physical carrier medium such as DVDs, CDs or SD cards. These ambiguities have a long history which transcends the Moratorium debate and have often been referred to as the ‘classification issue’.
- **Whether the Moratorium applies to content or to the ‘carrier medium’.** That is, whether, absent the Moratorium, customs duties would be charged on the transmission itself, i.e., the bits and bytes that carry the content, or the content that is being carried by the transmission.⁶⁻⁷

Other concerns have been expressed regarding the scope of the Moratorium (Banga and Kozul-Wright, 2020_[7]). These include whether the Moratorium affects the ability to tax or regulate digital transactions. Here the evidence is clearer. The Moratorium applies to customs duties, a form of discriminatory taxation on goods, it does not affect the ability to engage in taxation through, for instance, non-discriminatory Goods and Services Taxes (GST) or Value Added Taxes (VAT). The Moratorium also does not affect the ability of countries to regulate the digital economy, including on issues of competition, data protection or cybersecurity (provided these are in compliance with other existing WTO commitments). Indeed, the regular extensions of the Moratorium have not stopped countries from regulating many different aspects of the digital economy.⁸

⁵ See (López-Gonzalez, Sorescu and Kaynak, 2023_[32]) which highlights the growth of digital trade since 1995.

⁶ This issue was recently raised by Indonesia ahead of the Buenos Aires Ministerial Conference. Indonesia argued in favour of the inclusion in the Moratorium of the notion that: “the extension of the moratorium applies only to the electronic transmissions and not to products or contents which are submitted electronically” (WTO, 2017_[52]). WTO Members, however, did not favour this approach, and the Buenos Aires Ministerial Declaration on Electronic Commerce maintains the ambiguity on the content vs. carrier debate (WTO, 2017_[53]).

⁷ To date, customs duties have not been applied to electronic transmissions (either to the content or to the carrier-medium).

⁸ See for instance the OECD Digital Trade Inventory which identifies existing rules, standards and principles relevant for digital trade across different fora (Nemoto and López-González, 2021_[56]).

3. What can be learnt about the potential scope of the e-commerce Moratorium from Regional Trade Agreements?

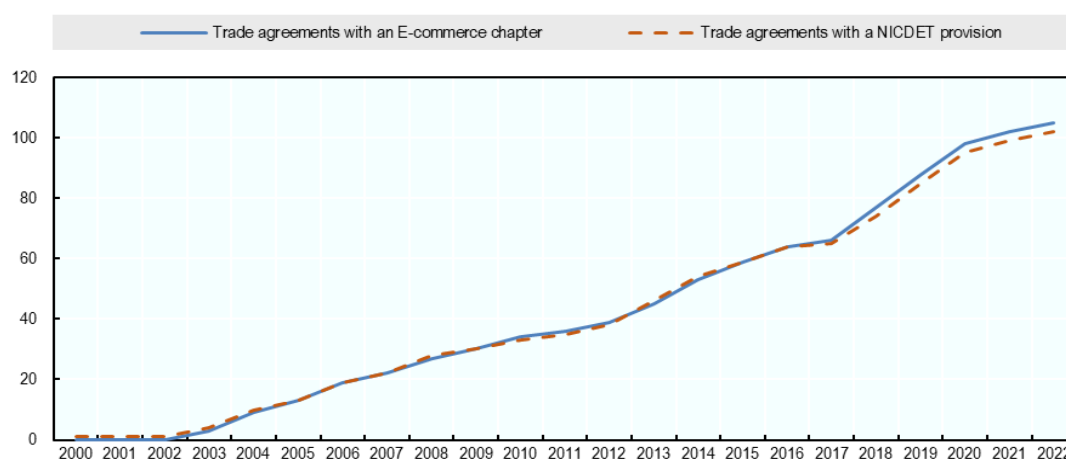
Identifying how countries have approached customs duties on electronic transmissions in their trade agreements can provide useful information about the possible contours of WTO Members' understanding of the Moratorium.⁹ This can help provide greater clarity and transparency to the ongoing discussions about the scope of the Moratorium and the definition of electronic transmissions.

3.1. NICTED provisions are widespread and growing

Provisions on the non-imposition of customs duties on electronic transmissions (NICDET provisions) are some of the most common elements in e-commerce chapters. There are nearly as many NICDET provisions as there are e-commerce chapters (out of the current 105 signed agreements with an e-commerce chapter, 100 agreements include a NICDET provision), Figure 1.¹⁰⁻¹¹

Figure 1. NICDET provisions are present in nearly all existing e-commerce chapters in RTAs

Count of total e-commerce chapters and of NICDET provisions (2000-2022)



Note: The figure reports all signed e-commerce chapters and NICDET provisions from the TAPED database.

Source: Own calculations based on TAPED database (Burri and Polanco, 2020^[8]; Burri, Vásquez Callo-Müller and Kugler, 2022^[9]). The analysis presented herein is based on TAPED version 06/22, available at the time of writing.

⁹ The term 'scope of the moratorium' is used in this report to refer to issues around both the *scope* of the moratorium and the *definition* of electronic transmissions, without prejudice to whether the issues fall in one or another of these categories.

¹⁰ There are some instances where NICDET provisions are found outside e-commerce chapters, typically in an Annex to the agreement (e.g. Jordan-US Free Trade Agreement (FTA), Central America-EFTA FTA, Colombia-Israel FTA).

¹¹ For greater clarity, this report does not cover the analysis of interactions and hierarchical relationships between different chapters or provisions in Regional Trade Agreements, which may affect the binding level of NICDET provisions in the broader legal structure of the RTA.

NICDET provisions, while always confirming the non-imposition of customs duties on electronic transmissions, take many different forms (see Box 1 for some illustrative examples). Some refer explicitly to ‘digital products’, others to services. Some transpose WTO commitments, while others provide greater clarity on what might be included or excluded from the provision (such as on internal taxation).

Box 1. NICDET provisions in RTAs take diverse forms

Comprehensive Economic Cooperation Agreement between The Republic of India and the Republic of Singapore, Chapter 10 (Electronic Commerce), 2005

Article 10.4: Digital products

1. A Party shall not apply customs duties or other duties, fees or charges on or in connection with the importation or exportation of digital products by electronic transmission¹⁰⁻³. [...]

¹⁰⁻³ The obligation in paragraph 1 does not preclude a Party from imposing internal taxes or other internal charges provided that these are imposed in a manner consistent with Article III of GATT 1994 and its interpretative note as incorporated into this Agreement by Article 2.2.

Economic Partnership Agreement between the CARIFORUM States and the European Community, Chapter 6 (Electronic Commerce), 2008

Article 119.3: Objective and principles

The Parties agree that deliveries by electronic means shall be considered as the provision of services, within the meaning of Chapter 3 of this Title, which cannot be subject to customs duties.

Regional Comprehensive Economic Partnership Agreement, Chapter 12 (Electronic Commerce), 2020

Article 12.11: Customs Duties

1. Each Party shall maintain its current practice of not imposing customs duties on electronic transmissions between the Parties.

2. The practice referred to in paragraph 1 is in accordance with the WTO Ministerial Decision of 13 December 2017 in relation to the Work Programme on Electronic Commerce (WT/MIN(17)/65).

3. Each Party may adjust its practice referred to in paragraph 1 with respect to any further outcomes in the WTO Ministerial Decisions on customs duties on electronic transmissions within the framework of the Work Programme on Electronic Commerce.

4. The Parties shall review this Article in light of any further WTO Ministerial Decisions in relation to the Work Programme on Electronic Commerce.

5. For greater certainty, paragraph 1 shall not preclude a Party from imposing taxes, fees, or other charges on electronic transmissions, provided that such taxes, fees, or charges are imposed in a manner consistent with this Agreement.

3.2. NICDET provisions can shed light on Members' approaches to electronic transmissions

Analysis of the different characteristics, additions and clarifications included in NICDET provisions over time illustrates how countries are approaching electronic transmissions in their trade agreements, in turn helping shed light on the potential contours of the scope of the Moratorium.¹² Six key observations emerge:

- **The majority of agreements (88 out of 100) do not tie NICDET provisions to the outcome of the WTO E-commerce Work Programme** (top-left quadrant, Figure 2). This means that most agreements do not specify that the lapse of the multilateral practice would lead to the review of their NICDET provision. The opposite is true for only 12 agreements which explicitly tie commitments to the WTO e-commerce Work Programme.
- **Internal taxation is deemed to be outside the scope of NICDET provisions** (bottom-left quadrant of Figure 2). The first and most widespread clarification is the *exclusion of internal taxation* from the scope of the NICDET provision, provided that these are imposed in a manner consistent with the trade agreement or the GATT.¹³
- Many agreements also clarify that measures related to the **electronic delivery of services fall within the scope of obligations and exceptions contained in other chapters** of the agreement, typically the services or investment chapters (bottom-left quadrant of Figure 2). That is, it is clarified that services commitments and flexibilities apply to the electronic delivery of services.
- **Clarifications on carrier medium versus content have evolved** (bottom-left quadrant of Figure 2). Early agreements tended to include a requirement that parties determine the customs value of imported *carrier media* according to the cost or value of the carrier medium alone when imported physically, without regard to the value of the 'content' in the transaction.¹⁴ More recently, starting from around 2015, digital trade chapters increasingly included the clarification that the NICDET provision covers the 'content' of electronic transmission,¹⁵ possibly in response to the evolution of discussion on the carrier vs. content elements of electronic transmissions at the WTO (WTO, 2017_[10]). There are no trade agreements clarifying that the NICDET provision only applies to the 'carrier' element of electronic transmissions.
- **There are different interpretations on whether electronic transmissions are 'digital products' or services** (bottom-right quadrant, Figure 2). Some agreements refer to 'the importation or exportation of digital products by electronic means',¹⁶

¹² Most of the characteristics, additions and clarifications are within the NICDET commitments. However, some, including with respect to customs valuation, or the relation with electronic delivery of services, can be in other provisions of the e-commerce chapter.

¹³ This clarification is often included in parallel to the additional prohibition on the imposition of 'fees and other charges'. Hence, there is generally a distinction between internal taxation and 'customs duties, fees and other charges'.

¹⁴ E.g. Chile- Colombia Free Trade Agreement (2006).

¹⁵ E.g. Singapore-Türkiye Free Trade Agreement (2016).

¹⁶ E.g. Korea-Singapore Free Trade Agreement (2005).

and often to the non-discriminatory treatment of those digital products, with accompanying definitions of what digital products are (i.e. computer programs, text, video, images, sound recordings and other products that are digitally encoded).¹⁷ Other agreements stipulate that ‘deliveries by electronic means shall be considered as the provision of services [...] which cannot be subject to customs duties’.¹⁸ NICDET provisions that do not further qualify the meaning of electronic transmissions became the most common type of provision in 2019, outpacing the growth of the other two types in recent years.

- **A growing number of provisions clarify the preferential nature of NICDET commitments** (top-right quadrant). This means that an increasing number of agreements specify that the NICDET provision only applies with respect to the Parties, i.e. ‘between a person of one Party and a person of the other Party’, or ‘between the parties’ (41 out of 100 agreements).¹⁹

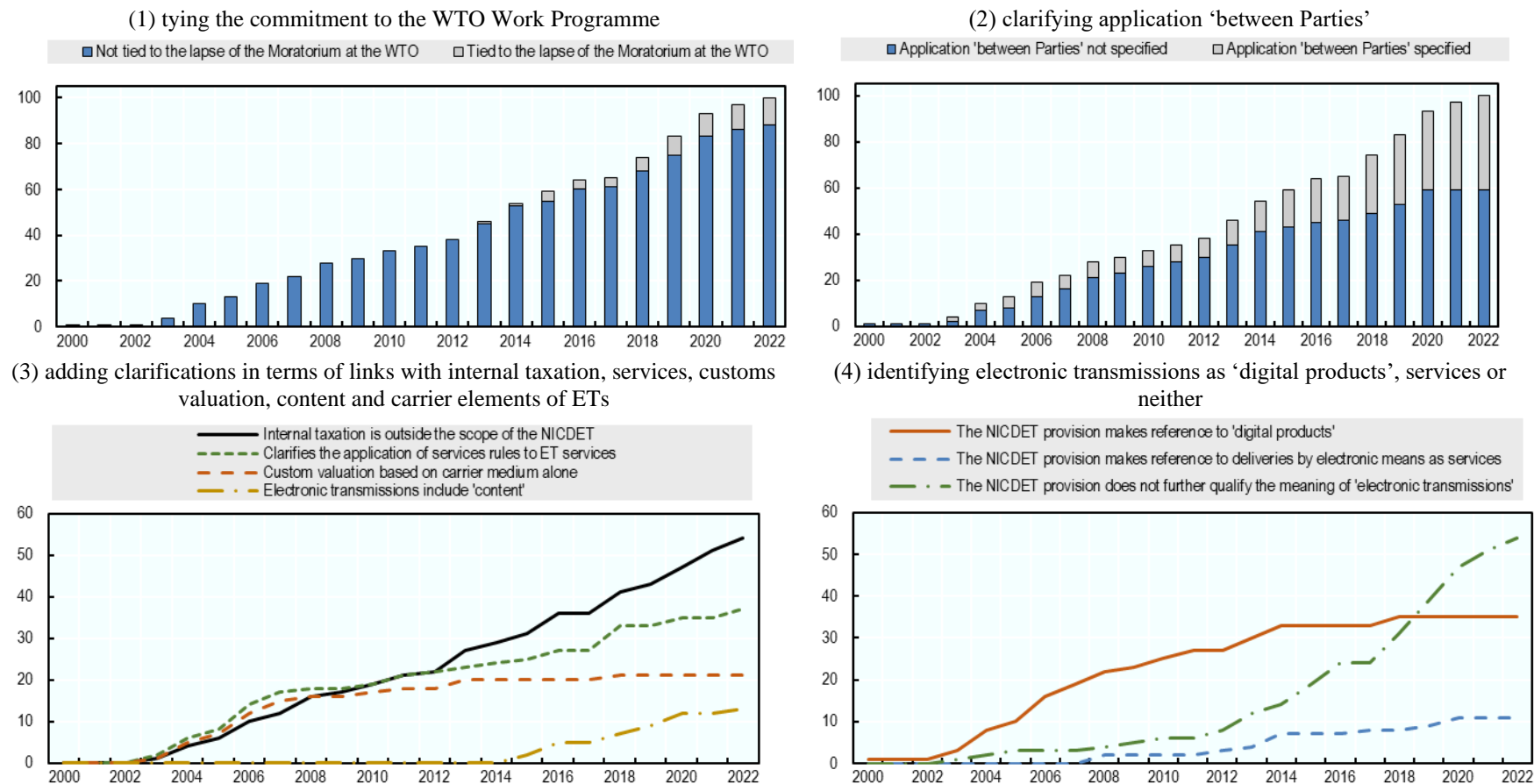
¹⁷ E.g. Central America-Mexico Free Trade Agreement (2011).

¹⁸ E.g. Colombia-Israel Free Trade Agreement (2013).

¹⁹ E.g. USMCA (2018) and New Zealand-Taiwan FTA (2013).

Figure 2. The evolution of NICDET provisions in Regional Trade Agreements

The figure shows the number of NICDET provisions:



Source: see Annex A, based on TAPED (2022^[9]).

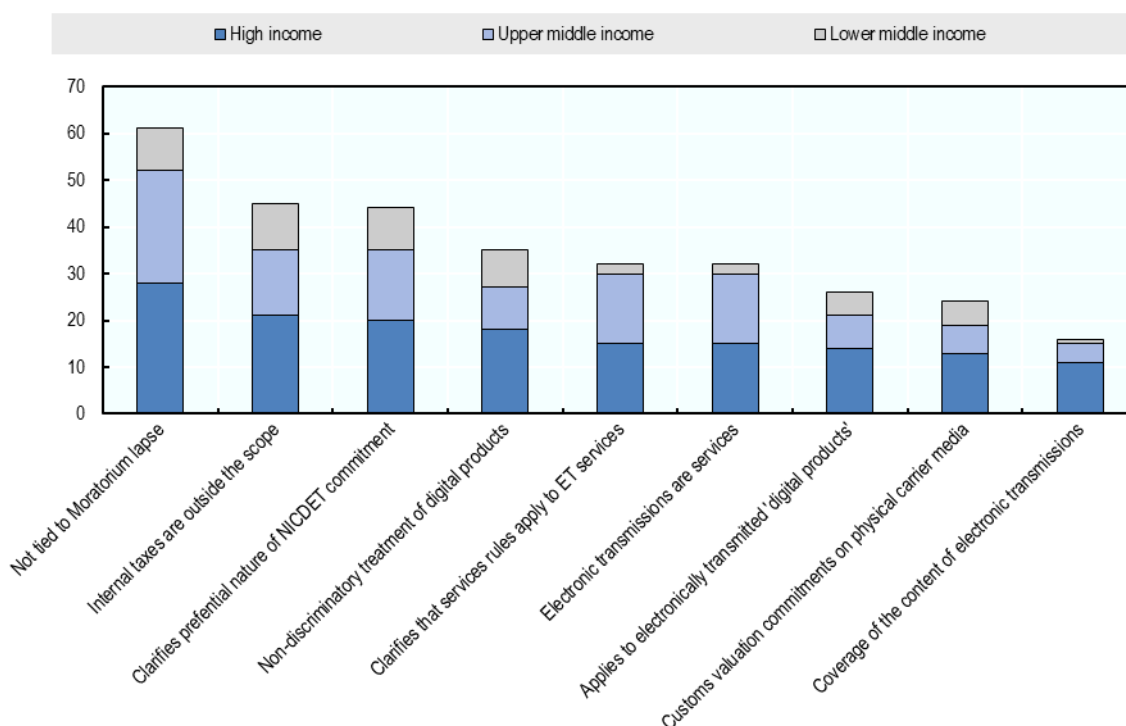
3.3. NICDET provisions have been agreed by countries at different levels of development

In total 102 countries – more than half of the WTO Membership – have signed at least one NICDET provision in their trade agreements: 56 High-income countries (30 if the EU is counted as one), 31 Upper-middle-income countries, and 15 Lower-middle-income countries.²⁰ Low-income countries have never signed NICDET provisions, but nor are they party to any agreement with an e-commerce chapter.

There is a relatively even distribution of NICDET commitments and clarifications across income groups (Figure 3). For instance, 33 developing countries and 54 high income economies signed a NICDET provision that is not tied to the outcome of the WTO E-commerce Work Programme. Similarly, the exclusion of internal taxation from the scope of NICDET provisions is common across the development spectrum, as are clarifications on the nature of commitments (e.g. whether the preferential nature of the commitment is clarified). See Annex Table A.1. for a description of the different elements in NICDET provisions.

Figure 3. NICDET commitments across signatories at different levels of development

Number of signatories adopting additional NICDET commitments or clarifications, by income group



Note: The Figure reports the number of countries (EU counted as one) having signed an addition or clarification to the general NICDET commitment in at least one trade agreements. Income groups based on the 2022-2023 World Bank classification. Source: Own calculations based on TAPED.

²⁰ Using the TAPED database (Burri, Vásquez Callo-Müller and Kugler, 2022^[9]) and the 2022-2023 World Bank Income group classification.

3.4. Countries have found ways to accommodate different understandings of electronic transmissions

In addition, a number of different approaches as to what electronic transmissions refers to coexist across these agreements. These can be grouped into four broad categories (see Figure 4 for a country breakdown), based on whether countries have further clarified the concept of electronic transmissions in at least one of their trade agreements:

- **No additional clarification of what electronic transmissions are.** These are countries that have not clarified in greater detail the scope of the NICDET commitment in their RTA. This includes the use of provisions that directly reference WTO Ministerial outcomes²¹ as well as those that simply use the term ‘electronic transmissions’ without reference to the WTO discussions.²²
- **Electronic transmissions as ‘digital products’.** These are approaches where countries explicitly define their NICDET commitments as applying to the importation or exportation of ‘digital products’ by electronic transmissions,²³ often giving examples of what these might be.
- **Electronic transmissions, or delivery by electronic means, as services.** These are approaches where countries couch their NICDET commitments under an understanding that deliveries by electronic means shall be considered as the provision of services, which cannot be subject to customs duties.²⁴
- **Overlapping approaches on the classification of electronic transmissions.** This category of approaches relates to: i) countries which recognise – in the same agreement – that delivery by electronic means is to be considered as the supply of services, and that no customs duties shall be applied on the importation or exportation of digital products by electronic transmission;²⁵ and ii) countries which have signed different agreements, explicitly recognising ‘electronic transmissions’ (or ‘delivery by electronic means’) as ‘digital products’ or services with different partners.²⁶

Of particular interest are interactions between countries in different groups. For example, some countries that are associated with one approach have signed NICDET provisions with countries associated with another approach, using language that does not explicitly recognise either approach. That is, they recreate the flexible language of the Moratorium in their RTA. For example, the EU-Korea Agreement stipulates that customs duties shall not be imposed on ‘deliveries by electronic means’ and the Canada-EU FTA (CETA) refers to ‘a delivery transmitted by electronic means’ – with no specific mention of ‘digital products’ or delivery by electronic means as services.

²¹ Such as the People’s Republic of China (see for instance China - Mauritius Free Trade Agreement (2019), Cambodia – China FTA (2020).

²² Such as New Zealand (e.g. New Zealand Thailand FTA, CPTPP).

²³ E.g. the United States and Singapore in the Singapore-US FTA (2003).

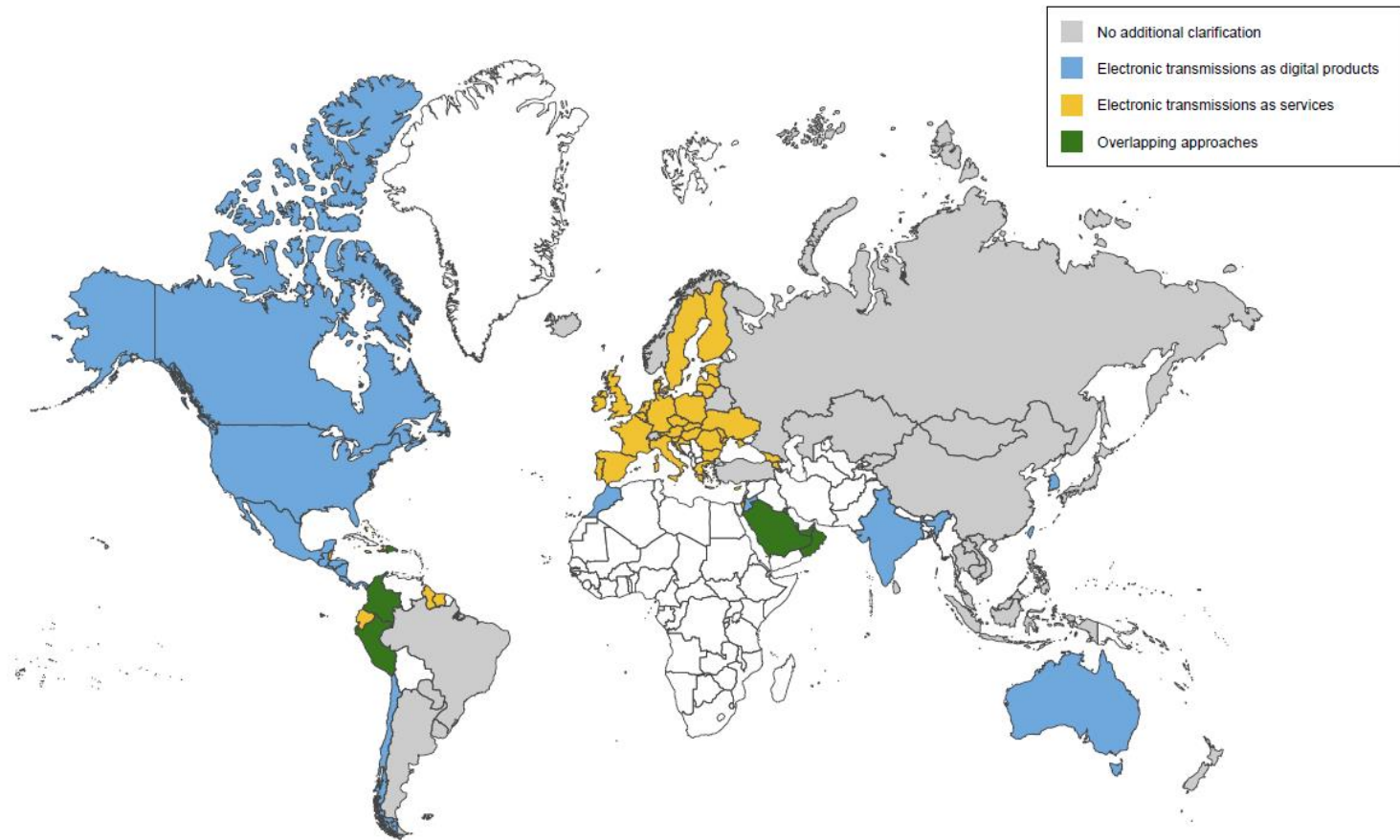
²⁴ See for instance CARIFORUM countries and the European Union in their Economic Partnership Agreement (2008).

²⁵ The only case is the Gulf Cooperation Council-Singapore FTA (2008).

²⁶ For instance, this is the case of Colombia (e.g., comparing the Colombia – Costa Rica FTA (2013) and the Colombia Peru Ecuador – EU FTA (2012)).

Figure 4. Approaches to the definition of electronic transmissions in NICDET provisions

Countries in white never signed a NICDET provision



Source: Own calculations

Overall, a number of lessons about the potential contours of the scope of the Moratorium can be learnt from looking at what countries have agreed in their RTAs:

- There appears to be widespread understanding that the Moratorium does not apply to internal, non-discriminatory, taxation.
- There is strong consensus that the Moratorium applies to commitments on customs duties with no incidence on the wider regulation of electronic delivery of services. That is, commitments and flexibilities, as per GATT or GATS, or in services or investment chapters in RTAs, remain.
- There is no NICDET provision that clarifies that the non-imposition of customs duties applies to the ‘carrier’ element of electronic transmissions, while an increasing number of agreements clarify that the commitment applies to content.
- While there are differing approaches as to whether commitments apply to ‘digital products’ or services, countries have found ways to bridge different approaches through the use of flexible language.

Another important element to consider is the certainty and stability that the Moratorium provides. The guarantee that digital transactions do not attract tariffs regardless of how different countries may classify them constitutes a key benefit for trade in the form of a lid on a metaphorical Pandora box of conflictual trade policy issues. In a somewhat paradoxical way, the lack of precision of the e-commerce Moratorium is both a challenge and an opportunity. On the one hand, it raises issues about its precise scope, but, on the other hand, it enables a variety of views to coexist.

4. What insights can be gleaned from international trade data?

Trade data can provide valuable insights into evolving trends across the different categories of trade that may be relevant for discussions on electronic transmissions. Although there are difficulties in classifying transactions that involve content delivered electronically, trade statistics measure the value of physical trade in digitisable goods in trade in goods statistics – and the value of digitally delivered ‘content’ in services statistics (see Box 2). This implies that analysis of electronic transmissions needs to be approached looking at both goods and services trade, without prejudice to how electronic transmissions are defined.²⁷

²⁷ For the purpose of clarity, trade statistics manuals also do not prescribe how these transactions should be treated in other frameworks – such as in legal agreements that may refer to goods or services. These manuals however highlight that digital delivery of formerly physical trade is likely to be included in the trade in services account – even though this cannot be distinguished from other computer, audio-visual, and information services transactions.

Box 2. For measurement purposes, statistical manuals record transactions involving ‘content’ in the trade in services account

Trade statistics manuals generally recognise that transactions involving ‘content’ challenge the distinction between goods and services. However, these manuals also converge on the classification of these transactions in the trade in services account for measurement purposes:

- **The UN International Merchandise Trade Manual** recommends that “the electronic delivery [...] from one country to another of any content [...] is explicitly excluded from the scope of international merchandise trade statistics” (UN Statistics Division, 2011, p. 22_[11]). This includes online books, newspapers, musical audio downloads, system software downloads, online games, and more (UN Statistics Division, 2011, p. 22_[11]).
- **The Balance of Payment statistics Manual (BPM6)** recommends that ‘content’ be recorded as a computer service or an audio-visual service transaction – including when these transactions take place on physical carrier media (International Monetary Fund, 2009, p. 176_[12]).²⁸⁻²⁹ In addition, “downloaded content that is not software (included in computer services) or audio and video (included in audiovisual and related services) is included in information services” (International Monetary Fund, 2009, p. 177_[12]).
- **The Central Product Classification Manual (2.1)** recognises that some products, for instance software or industrial design concepts, do not meet all the conditions to be recorded as either goods or services (UN Department of Economic and Social Affairs, 2015, p. 11_[13]). These ‘other products’ are classified in sections of the CPC that are reserved for services (CPC 5 to 9).
- **The OECD-WTO-IMF Handbook on Measuring Digital Trade**, whose measurement framework is in line with BPM6 and IMTS 2010, takes the view that only services can be digitally delivered (OECD/WTO/IMF, 2019_[14]; IMF-OECD-UNCTAD-WTO, 2023_[15]).

4.1. Imports of digitisable goods are slowing, but this is largely a high-income country phenomenon

The debate on the impact of the Moratorium is often couched in the context of ‘digitisable goods’, which are physical goods that have the potential to be digitised and subsequently sent across borders digitally (WTO, 2016_[16]). They include cassettes, videotapes, CDs, DVDs, books, calendars, photographic film and other media storage devices.

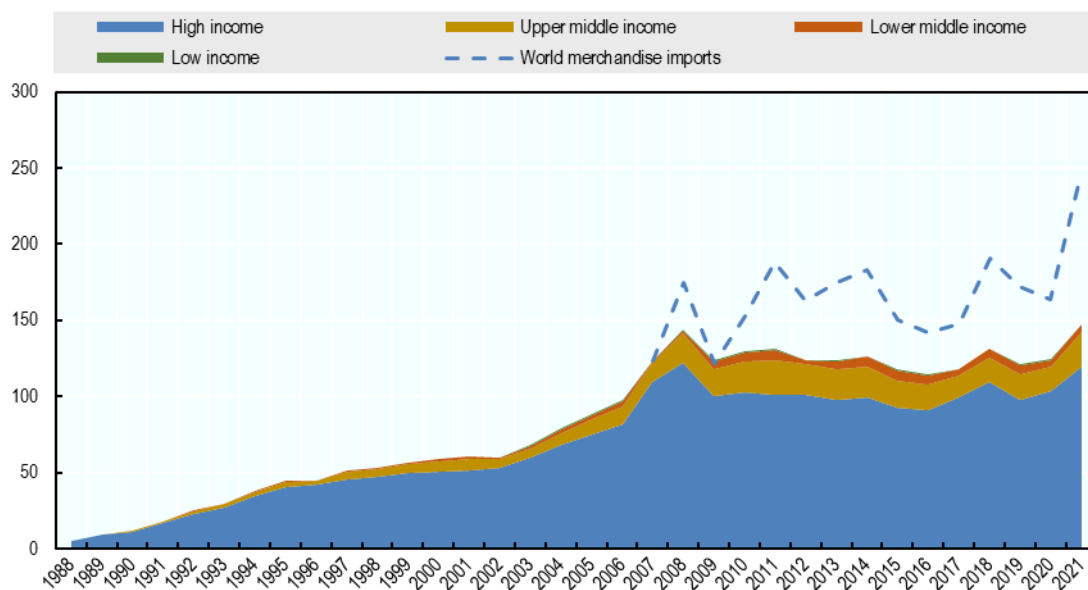
²⁸ The only exception is non-customised ‘content’ provided on physical media with a license for perpetual use – which should be classified as a goods transaction.

²⁹ The UN International Merchandise Trade Manual recognises that, to comply with Balance of Payment guidance, such transactions should in principle be excluded from merchandise trade statistics. It is recognised, however, “that the exclusion of such media may not be possible in view of (a) the prevailing customs practice of classifying both non-recorded and recorded media in one classification heading without any further differentiation and (b) the absence of other reliable and cost-effective data sources for systematic identification.” (UN Statistics Division, 2011, p. 16_[11]). The general guideline remains that “media, whether or not recorded is included in international merchandise trade statistics at its full transaction value” (p. 15_[11]).

Digitisable goods witnessed a sustained increase in trade from 1998 to 2008, after which they plateaued (except for a recent slight uptick in 2021) – Figure 5.³⁰ Since 2009, growth in digitisable goods imports began to slow relative to total merchandise trade (see dotted line in Figure 5). This observation is often used as evidence of the dematerialisation of trade in digitisable goods, most recently by Indonesia (WTO, 2022^[5]). However, this aggregate picture hides significant heterogeneity. High-income countries account for more than 80% of the value of imports of digitisable goods globally, which is why the figure is largely reflective of the situation in those economies.

Figure 5. High-income countries account for the lion’s share of world imports of digitisable goods

Value of imports of digitisable goods by income group, USD billion, 1988-2021



Note: Based on 196 countries. ‘World merchandise imports’ reflects a counterfactual value of imports had digitisable goods imports followed the same trade pattern as global trade starting from 2007.

Source: Own calculations from UN COMTRADE.

Data on individual country imports reveals that, for the majority of non-high-income countries, imports of digitisable goods kept growing after 2009 – Figure 6. For instance, low-income countries saw their imports increase, on average in the order of 43% per annum.³¹ More generally, the average rate of growth of imports of digitisable goods appears to be inversely correlated with income status – suggesting that the plateauing or contraction in digitisable goods imports has largely taken place in high income economies. Importantly, and even in high-income countries, the data suggest that not all digitisable goods are being

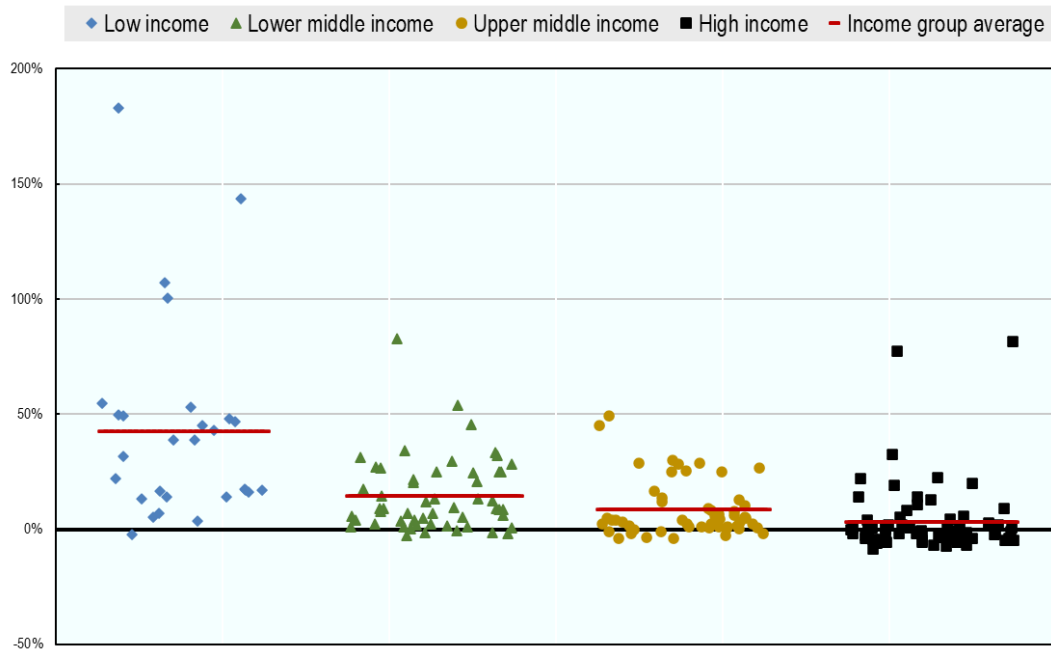
³⁰ Digitisable goods are defined in WTO (2016^[16]) as “physical goods which have the potential to be digitised and subsequently sent across borders digitally”. They are identified in this report using a list compiled from the WTO (2016^[16]) and Banga (2019^[22]). The full list of digitisable goods in all HS nomenclatures is provided in Annex B.

³¹ Only one low-income country witnessed average negative changes over the period (Democratic People’s Republic of Korea).

digitised. Trade in digitisable goods is still ongoing and, where applicable, tariff revenue on these products is still being collected.

Figure 6. Imports of digitisable goods have been growing in developing countries over the last decade

Average yearly change in physical imports of digitisable goods in 2008-2019, by income group



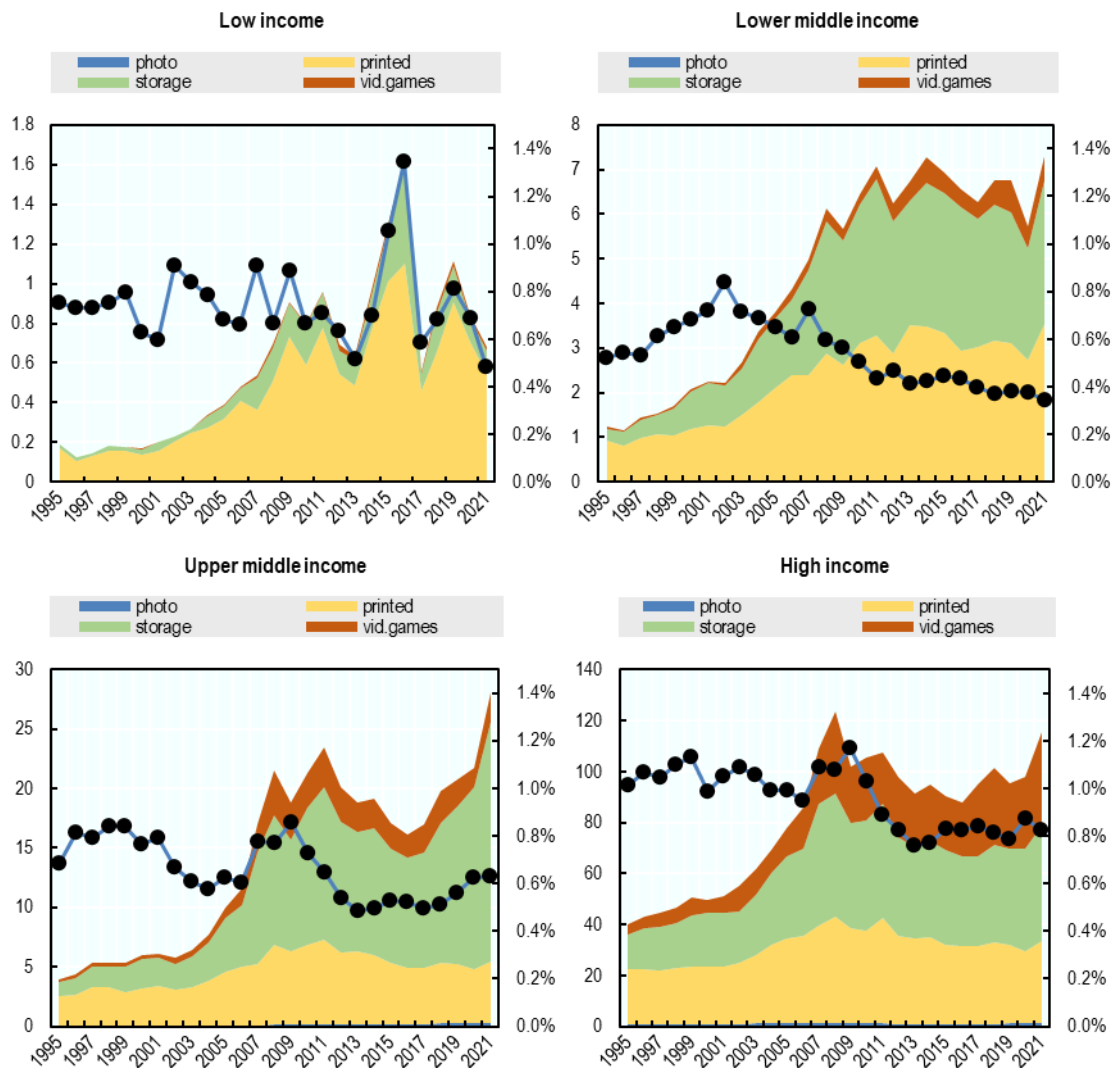
Note: Individual markers represent individual countries. Based on 206 countries & territories. Red lines show the income group average. The horizontal axis line indicates 0% average growth.

Source: Own calculations using BACI.

The composition of imports of digitisable goods also differs significantly across countries at different levels of development (Figure 7). In low-income countries, printed matter, including books, represents most imports (around 70%). In lower-middle-income countries, printed matter represents around 35% of imports, a similar share to digital storage devices (e.g. CDs, USBs, magnetic tapes). In upper-middle and high-income countries, digital storage devices represent the highest share of digitisable good imports (50-60%). Photographic material represents the smallest share of digitisable goods imports across all income groups. In addition, digitisable goods in general represent a very small, although generally declining, share of total goods trade across all income categories (between 0.3% and 0.8% of total imports).

Figure 7. The composition of digitisable goods imports varies across income groups

Share and value of digitisable goods imports



Note: Photo refers to ‘photographic film’, ‘printed’=printed matter; storage=storage devices (e.g. USB drives, CDs); vid.games=video games. The share variable represents the share of digitisable goods imports in total imports.
Source: BACI.

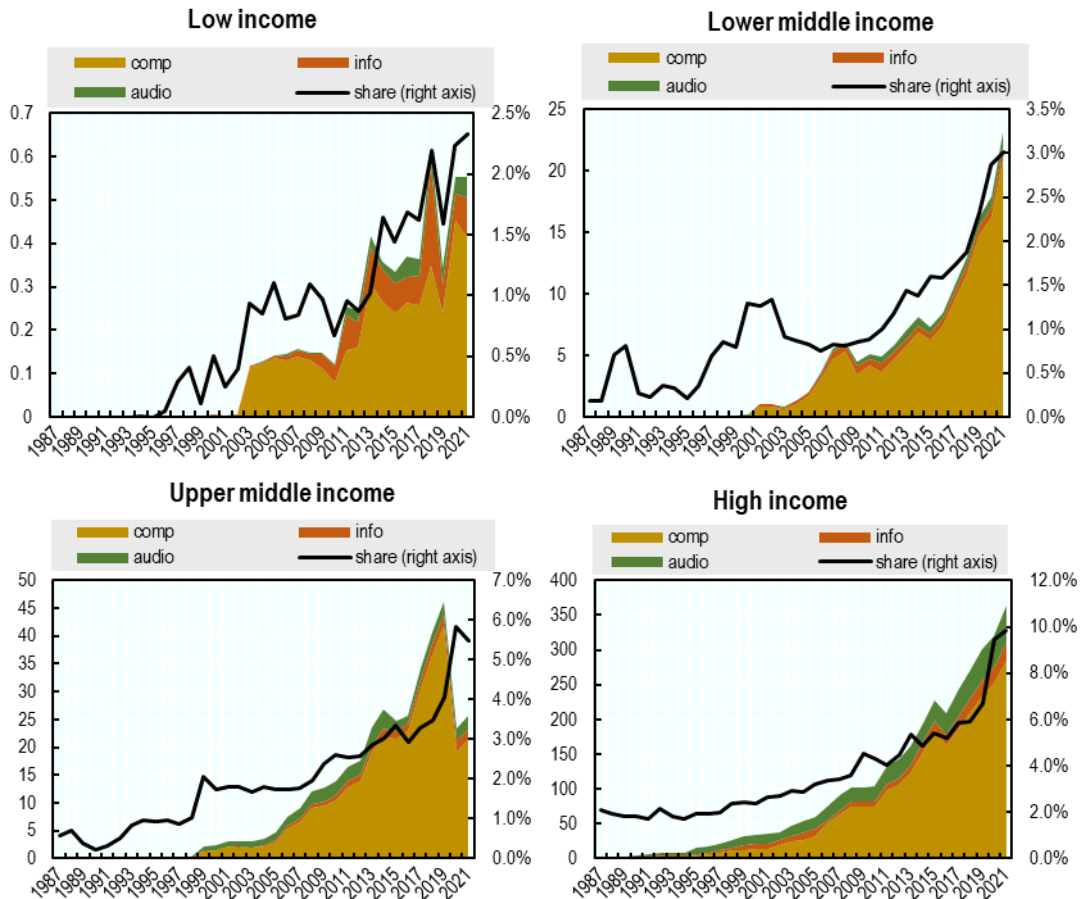
4.2. Digital services imports grew significantly across all income groups

Trade in services statistics, and in particular trade in computer, audio-visual and information services, can provide important insights for discussions on electronic transmissions (see Box 2). These statistics capture two aspects of trade. The first is the value of items that were previously being traded in physical format and that are now traded digitally. This would be the trade that tends to be associated most closely with electronic transmissions. It would include, for example, movies previously recorded in DVDs that are now being downloaded. However, these digital services statistics also capture trade that was never traded through physical carrier media. This includes services such as computer programming or cloud computing, services that are ‘born digital’. However, trade statistics do not separately identify these two flows.

Contrary to digitisable goods imports, imports of computer, audio-visual and information services (referred to as ‘digital services’) have been on a stable growth path across all income groups over the past decade (Figure 8). This increase has largely taken place in one category of services trade: computer services.

Figure 8. Digital services imports have been growing across most sectors (1987-2021)

Left axis= billion USD, right axis= share in total services imports



Note: The sudden drop in Upper middle income services imports in 2020-2021 is due to missing data for the People’s Republic of China. Based on 175 countries. comp= computer services; info=information services; audio=audio-visual services. Source: UNCTAD-WTO trade in services statistics.

As was the case for digitisable goods imports, there is a high degree of heterogeneity in how digital services imports have grown for different countries within the same income group. However, digital services imports in the last decade grew faster – on average – than imports of digitisable goods (Figure 9).

Figure 9. Digital services imports have grown across all income groups in the past decade

Average yearly change in digital services imports in 2008-2019, by income group



Note: The chart only includes countries with less than five years of missing data. It also excludes countries for which the average measured increase in digital services imports is greater than 200%, for the purpose of representation. These countries are CPV, CYP, KWT, LBN, LSO, NIC, SEN, SWZ, TLS, TUR.

Note by Türkiye: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Türkiye recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Türkiye shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Türkiye. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus. Source: UNCTAD-WTO trade in services statistics, based on 135 countries.

Heterogeneities across both digitisable goods and digital services are important from the perspective of the potential customs revenue implications of the e-commerce Moratorium. They suggest that each country experiences different circumstances when it comes to the changes in the value and type of digitisable goods and digital services imports. Analysis on the potential customs revenue implications needs to take these heterogeneities into account.

5. Assessing the potential fiscal implications of the e-commerce Moratorium

Questions around the potential fiscal implications of the e-commerce Moratorium have been around since the Moratorium was first 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 may deprive WTO Members, particularly developing countries, of an important base on which customs duties are collected.³²

These concerns have motivated a large literature aiming to quantify the potential customs revenue that is ‘foregone’ because of the e-commerce Moratorium. However, this literature

³² See dedicated discussions on e-electronic commerce (WTO, 2001_[41]; WTO, 2002_[42]; WTO, 2002_[43]; WTO, 2003_[44]; WTO, 2003_[45]; WTO, 2005_[46]; WTO, 2009_[47]; WTO, 2011_[48]).

has, to date, not taken into account that imports of digitisable goods and electronic transmissions are also subject to other commitments and practices beyond the e-commerce Moratorium. Similarly, the question of what an appropriate counterfactual for *electronic transmissions* maybe has not been thoroughly examined – notably at a country-by-country level.

In addition, foregone customs revenue from customs duties is only one part of the potential fiscal implications of the Moratorium, with the other being the offsetting effects arising from growing revenue from other non-discriminatory taxes applied on electronic transmissions, including Goods and Services Taxes (GST) or Value Added Taxes (VAT).³³ Indeed, if the dematerialisation of digitisable goods leads to growing consumption of electronic transmissions, there will be a wider economic base on which to collect VAT or GST revenues.

5.1. Calculating the customs revenue implications of the Moratorium

Analysing the potential foregone revenue implications of the Moratorium can be difficult. Uncertainties around the scope of the Moratorium and the definition of electronic transmissions imply that assumptions need to be made about issues such as what tariffs might apply on which trade absent the Moratorium – or about how much trade has already been, or will be, digitised.

This is, in part, why existing estimates of the potential revenue implications of the Moratorium vary widely. They range from USD 280 million to USD 14.3 billion, depending on the trade flows covered and tariffs applied (i.e. whether effectively applied, MFN or bound rates), as well as other underlying assumptions – See Box 3.³⁴ However, as shown in Andrenelli and Lopez-Gonzalez (2019_[11]) and Evenett (2021_[17]), these estimates represent a small share, at most 0.01-0.33%, of overall government revenue (see Table 2). This finding is also confirmed by case study evidence on Egypt and Vietnam (Köhler-Suzuki, 2020_[18]).

Moreover, as noted above, existing empirical studies have not addressed two important issues that bias current estimates. The first is that existing commitments and practices, such as NICDET provisions or other preferences granted in RTAs, affect the ability of countries to raise tariffs on digitisable goods and electronic transmissions, even in the absence of the e-commerce Moratorium. The second relates to estimating the value of *electronic transmissions* (i.e. the taxable base), with current estimates assuming that: i) all imports of digitisable goods will be electronically transmitted; and/or ii) the rate of growth of digitisable goods imports would have been the same for all countries absent the Moratorium (in contrast to the findings from Section 4 highlighting a significant degree of heterogeneity). Not taking these two issues into account in calculations is likely to lead to an overestimation of the customs revenue implications of the e-commerce Moratorium.

³³ The terms VAT and GST are used interchangeably in this paper.

³⁴ This includes the value of trade that might or might not be affected, the counterfactual scenario, or whether or not it is assumed to be possible to impose duties on trade in services.

Table 1. Estimates of revenue implications of the Moratorium in perspective

Study	Duty Type	% of total government revenues	
		Developed countries	Developing countries
Schuknecht and Pérez-Esteve (1999)	Applied	0.01	0.13
Teltscher (2000)	Applied	0.02	0.07
WTO (2016)	Applied	0.01	0.06
Banga (2017)	Bound	0.00	0.01
Banga (2019)	Applied	0.00	0.08
	MFN	0.00	0.10
	Bound	0.00	0.23
Banga (2022)	Applied		0.13*
	MFN		
	Bound		0.33*

Note: Government revenue obtained from the World Bank's World Development Indicators (WDI). *Variable used is general government final consumption expenditure.

Source: Updated from Andrenelli and López González (2019_[1]).

Box 3. Empirical evidence on the customs revenue implications of the Moratorium

The first attempt to estimate the foregone customs revenue of the Moratorium was undertaken by Schuknecht and Pérez-Esteve (1999_[19]). They used a list of goods that included cinematographic film, newspapers and videogames to provide upper bound estimates of possible tariff revenue losses, based on the assumption that all trade that could be digitised would be digitised. They suggested that the potential foregone revenue effects would be modest, amounting to less than 1% of total tariff revenue across most countries. The paper also highlighted the strong potential for electronic transmissions to enhance services trade, underscoring that modest tariff revenue losses would need to be weighed against gains arising from growing trade in services (see also Mattoo and Schuknecht (2000_[20]) and Mattoo, Pérez-Esteve and Schuknecht (2001_[21])).

More recently, and at the request of WTO Members, the WTO Secretariat (2016_[16]) re-examined and updated analysis of tariff revenue losses arising from the Moratorium. Using a list of 30 HS 6-digit goods and their applied tariff rates, WTO (2016_[16]) estimated that the revenue collected from “digitisable goods” had fallen from USD 1.2 billion in 2000 to USD 823 million in 2014 – a global loss nearing USD 400 million.³⁵ Overall, the duties collected on digitisable goods imports amounted to 0.26% of total estimated customs revenue in 2014, with only four developing countries collecting more than 1.5% of total customs revenues from such tariffs.

Banga (2019_[22]) used an updated list of 49 goods, also using the HS classification, to estimate the revenue impact of the Moratorium, focusing not only on the potential revenue loss arising from these trade flows being fully digitised, but also on the revenue not collected on trade flows that might have already been digitised such as e-books. To identify these, Banga (2019_[22]) created a counterfactual projection of the value of trade that might have already been digitised by taking the growth rates of trade in these goods

³⁵ WTO (2016_[16]) defines “digitisable goods” as “physical goods which have the potential to be digitised and subsequently sent across borders digitally”.

between 1998-2010 and extrapolating these for the period 2011-2017.³⁶ Using average *bound* tariffs, Banga (2019_[22]) argues that potential aggregate tariff revenue losses could amount to USD 8 billion for developing countries and USD 212 million for developed economies in 2017. As expected, when using *effectively applied* duties, the foregone revenue is much reduced – USD 2.7 billion for developing countries and USD 123 million for developed countries. Banga (2022_[23]), using the same methodology, updated these estimates, highlighting that potential foregone revenue for developing and least developed countries in 2020 could amount to USD 14.3 billion when calculated using bound tariffs and USD 5.5 billion when using applied duties.

5.1.1. Other commitments and practices affect the ability to impose tariffs on digitisable goods

Existing calculations of the customs revenue implications of the Moratorium assume that the e-commerce Moratorium is the only commitment through which Members *forego* the ability to levy tariffs on digitisable goods and electronic transmissions. However, this is not the case. Beyond the e-commerce Moratorium, there are other commitments and practices which also affect the ability of countries to levy tariffs on electronic transmissions and digitisable goods. They include:

- **Preferential rates in RTAs.** Countries make commitments in their RTAs affording duty free or preferential access to digitisable goods.³⁷
- **NICDET provisions not tied to the WTO E-commerce Moratorium.** Eighty-seven countries (in a total of eighty-eight agreements) signed NICDET provisions that are not tied to the WTO Moratorium (see Section 3). This means that, should the Moratorium lapse, electronic transmissions would still not attract tariffs among signatories of these agreements.
- **WTO customs valuation decision 4.1.** Countries notifying this approach to the WTO have chosen to charge tariffs on the *carrier medium* and not the *content* of imports of magnetic media (tapes) and optical media (CDs) carrying software. This means that customs revenue is already not collected on a large share of the value of imports in these items (see Box 4).
- **Customs valuation commitments in regional trade agreements.** Countries have also made customs valuation commitments in their RTAs, applying regardless of the type of carrier media (magnetic, optical or semiconductor) and of content (software or other content) involved in physical transactions (see Box 4).
- **The Information Technology Agreement (ITA) and its expansion agreement.** The first ITA granted duty-free access for some digital storage devices with so-called product ‘ex-outs’³⁸ (e.g. magnetic tapes, CDs), while the ITA expansion

³⁶ Foregone revenue on customs duties not currently imposed on electronic transmissions is calculated using the annual average rate of growth of trade in digitisable goods during the period 1998-2010 to proxy for trade in electronic transmissions for the period 2011-2017.

³⁷ This also includes unilateral preferences under the enabling clause.

³⁸ Ex-outs refer to products which are partially covered at a HS 6-digit level, i.e. where only some national tariff lines within HS 6-digit codes qualify for duty-free treatment. Products covered in the first ITA are likely to be covered with ‘ex-outs’ in today’s HS nomenclature, even though they may have been committed at the HS 6 digit level in 1996.

agreement broadened commitments in these product categories and added some video game items to the list of covered products.³⁹

- **The GATS and services commitments in Regional Trade Agreements.** In line with the understanding adopted in several E-commerce chapters (see Section 3), electronic transmissions are subject to services commitments and exceptions. However, methodological difficulties prevent the inclusion of these commitments in this exercise.⁴⁰ Information on relevant GATS commitments is however provided in Annex C.

Ultimately, the potential foregone customs revenue due to the e-commerce Moratorium should be calculated as **the revenue that could potentially be collected on imports of digitisable goods and electronic transmissions that is not subject to any other commitment or practice** and, therefore, that would become ‘dutiable’ with the lapse of the Moratorium.

The incidence of each commitment or practice will vary by country and type of commitment: preferential commitments, for instance, will be important if a high share of digitisable goods imports comes from suppliers that are party to an RTA with the importing country, for the goods where commitments have been made. Similarly, NICDET provisions will be more relevant for some developing countries and high-income countries, but not for low-income countries, as they have not signed trade agreements with e-commerce chapters. The relevance of the ITA expansion agreement will also depend on membership of this agreement and on how much Members import in the product categories to which duty-free treatment commitments apply.

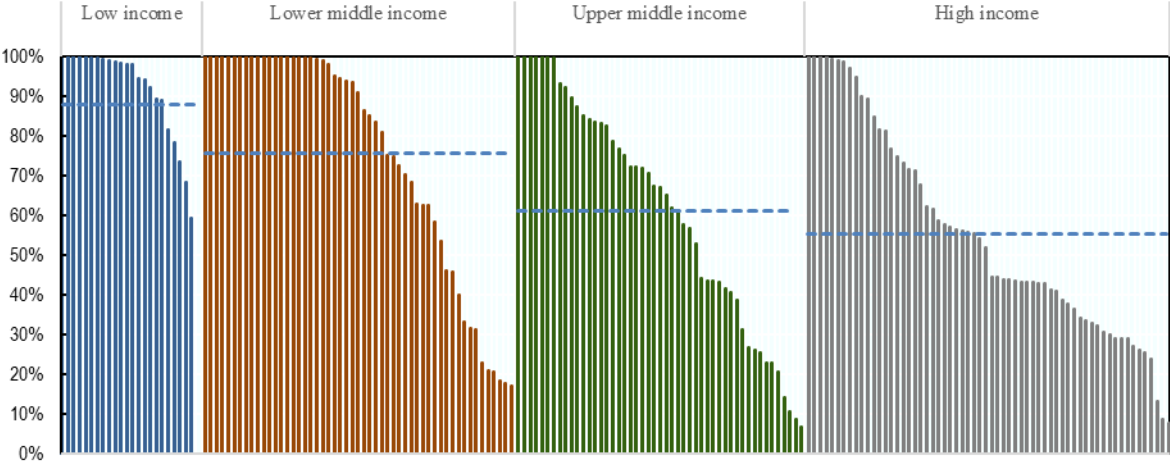
Taking these factors into account, overall, the value of digitisable goods that would be ‘dutiable’ with the lapse of the Moratorium is, on average, 67% of the value of import flows in digitisable goods. There is, however, a strong degree of variation both within and between income groups (Figure 10). The share of trade that is ‘dutiable’ is, on average, lowest for high-income and upper-middle-income countries, at 55% and 61% of digitisable goods imports respectively. It is highest, on average, for low-income countries (88%) by virtue of their more limited participation in RTAs, and hence fewer preferential commitments and NICDET provisions.

³⁹ Only commitments under the ITA expansion and with no ‘ex-outs’ are included in the analysis – in a conservative interpretation of the scope of these commitments.

⁴⁰ This is because a degree of judgement is required to determine which commitments would be relevant for electronic transmissions, and especially on how to deal with ‘asymmetric’ commitments, which arise for instance when computer services are committed but audio-visual services are not (the majority of cases). In addition, the lack of granularity in services trade statistics does not allow to differentiate the value of trade that would be covered by different commitments in services sub-sectors. These challenges also apply for services commitments undertaken in RTAs, where data availability issues also impose further barriers to use.

Figure 10. Other commitments and practices cover a significant share of imports of digitisable goods

Share of imports of digitisable goods that is not covered by existing commitments and practices, 2021 or latest available year



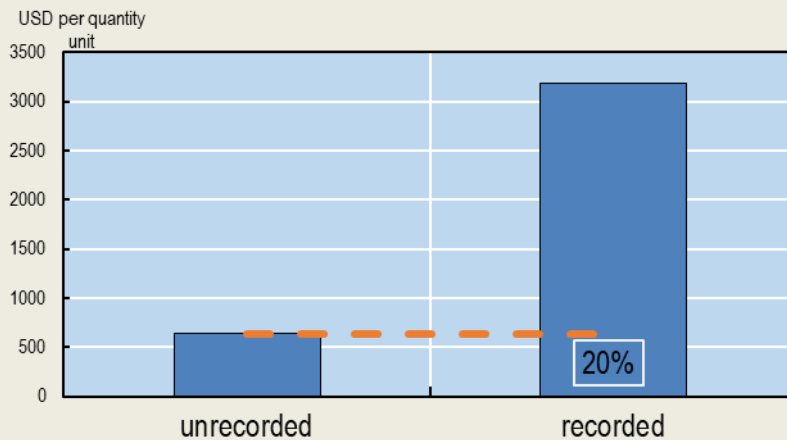
Note: Bars represent individual countries. The dotted line represents the income group average. 2021 or latest available year. Based on 188 countries for which data is available. Source: Own calculations based on TRAINS.

Box 4. Methodology to quantifying the incidence of customs valuation practices and ITA commitments for imports of digitisable goods

Customs valuation decision 4.1 and customs valuation commitments in RTAs

A unit value approach is used to distinguish the value of carrier and content elements of physically traded storage devices. For instance, to estimate the potential value of content and carrier elements of optical media, the unit value of traded unrecorded media (852342) is compared to the unit value of traded recorded media (852349). When CDs carry information, they are generally traded at a much higher average unit value than unrecorded CDs. For the category of recorded CDs, the carrier component can generally be expected to represent around 20% of the value of trade in this product category (see Figure 11).

Figure 11. On average, 80% of the value of trade in recorded optical media reflects ‘content’



Note: Based on the full sample of bilateral trade flows available in BACI for 2021 at the HS 6 digit level.
Source: BACI database.

However, the harmonised system classification does not provide sufficient detail to identify the share of content consisting of software within the recorded element of CDs or magnetic tapes, nor does it allow to distinguish – for other digital storage devices like USBs or magnetic tapes – the value of recorded vs. unrecorded media trade. This report relies on the more granular customs classifications of Canada, the European Union, and the United States to overcome these difficulties. See Annex B for greater details.

The Information Technology Agreement and its expansion agreement

Differences in the Harmonised System nomenclature revisions at the time of the signing of the ITA (1996) and today pose challenges for quantifying the incidence of commitments under the first ITA.⁴¹ Many of the products that would be covered are ‘ex-outs’ (only partially covered) and therefore excluded from the current exercise, although estimates on the potential value of digitisable goods imports they affect is provided in the statistical companion. The ITA expansion agreement, however, liberalises trade in chapter 85.23 with no ‘ex-outs’ and in the HS2012 nomenclature, which is why it is included within the scope of this section.

5.1.2. Countries are experiencing different rates of digitalisation

Identifying the tax base on which to calculate the revenue implications of the Moratorium is not straightforward. One especially difficult challenge is identifying the *counterfactual value of electronic transmissions*. This is trade that has moved from the goods accounts to the services accounts, or, in other words, items that were previously physically traded and which are now digitally traded.

Some of the existing empirical studies (i.e. Banga (2019_[22]; 2022_[23])) have used uniform average rates of growth of 8% (based on average annual growth rates of physical imports of digitizable products prior to 2010) to calculate the counterfactual value of electronic transmissions and then taking this as the tax base for calculations of the potential revenue

⁴¹ For an analysis of the scope of the first ITA agreement and its ex-outs in more recent HS nomenclatures, see the Digital Trade Review of Brazil (OECD, 2022_[50]).

implications of the Moratorium (also making the assumption that all that could be digitised would be digitised).

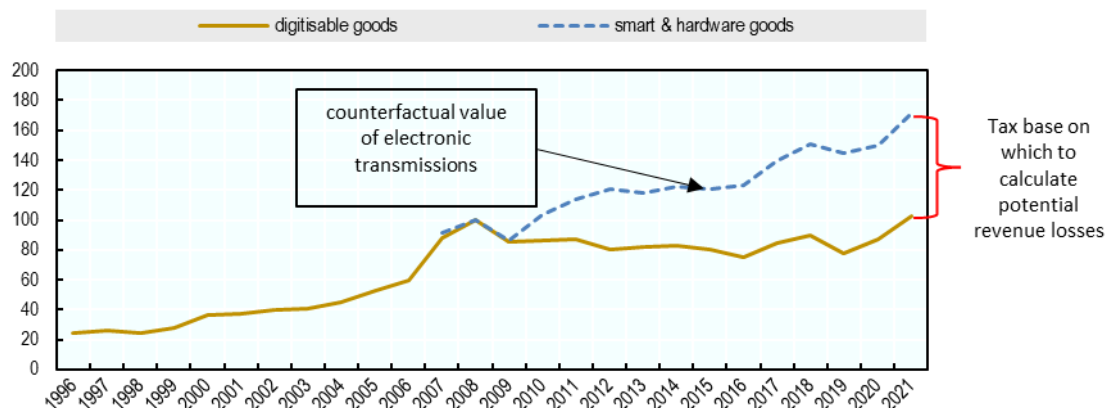
However, this does not take into account that: i) there is a high degree of heterogeneity in import growth of digitisable goods across different countries (see Section 4); ii) not everything that can be digitised is being digitised (see also Section 4); and iii) contemporaneous proxy measures for electronic transmissions can better reflect changes in demand, for instance capturing shocks such as the financial crisis in 2008 or the COVID-19 pandemic.

In order to address these shortcomings, a counterfactual, tied to country-specific changes in imports of ‘smart and hardware goods’, is used to identify the *counterfactual value of electronic transmissions*.⁴² This counterfactual includes mobile phones, projectors, headphones, speakers, smart TVs and computers, all of which can be associated with growing consumption of electronic transmissions (see Andrenelli and López-González (2019_[1]) for a list of these products). This implies that growth of imports of these products should be linked with growth in consumption of electronic transmissions.

The analysis also takes into account the fact that not everything that can be digitised will be digitised. Indeed, imports of digitisable goods actually grew for many countries, meaning that tariffs are still being collected on these items. The tax base on which to calculate the potential foregone revenue implications of the Moratorium is therefore identified as **the difference between the counterfactual value of electronic transmissions minus the actual value of digitisable goods imports** (digitisable goods that have not been digitised) – Figure 12a. The size of this tax base is, on average, highest for high-income countries and lowest for low-income countries, on a sliding scale across the different levels of development (Figure 12b), reflecting a more important slowdown of digitisable goods imports in high-income countries (see Section 4).

Figure 12. Hypothetical tax base for customs duties on electronic transmissions

a. Growth of imports by category (100=2008)



⁴² This is because smart and hardware goods imports can be expected to be closely related to the consumption of electronic transmissions. If those have been growing faster in some economies than in others, this measure will capture the heterogeneity in higher rates of growth for the associated goods. Similarly, if COVID-19 led to a sustained increase – or decrease – in the consumption of electronic transmissions, related imports of smart and hardware goods should be able to reflect this change.

- b. Difference in growth patterns for imports of digitisable goods and smart and hardware goods, by income category



Note: a): The solid lines shows the change in imports of digitisable goods from the baseline year 2008. The dotted line shows changes in imports of digitisable goods had these followed the same growth pattern as smart & hardware products.

b): bars show difference between the average rate of growth of imports digitisable goods and the average rate of imports of smart and hardware goods across income categories. Figure 12b excludes Congo in light of exceptionally high growth estimates for imports of digitisable items.

Source: Own calculations using BACI and TRAINS.

5.1.3. *The potential foregone customs revenue implications of the Moratorium are small*

Calculating the potential foregone revenue arising from the Moratorium requires combining the different elements discussed above. The **potential foregone customs revenue** is the sum of the product of:

- **The import tax base (ITB)**. This is the difference between the counterfactual value of imports of electronic transmissions and the observed value of imports of digitisable goods (on which tariffs are still being collected).
- **The share of imports that is effectively dutiable without breaching existing commitments or practices (DUT)**. This is the share of trade that would not be covered by existing commitments or practices (see Figure 10), and which would become ‘dutiable’ with the lapse of the Moratorium.
- **The tariff that could be applied (T)**. Which in this case would be the MFN tariff (since preferences are already being accounted for).

For any given country (i), the sum of the product of these variables across trade partners (j) and products at time (t), gives a measure of the potential foregone customs revenue ($PFCR_{it}$).

$$PFCR_{it} = \sum (ITB_{ijt} * DUT_{ijt} * T_{ijt})$$

Data limitations and methodological choices in the calculation introduce positive biases which imply that the resulting estimates are likely to be upward biased.⁴³

⁴³ Calculating foregone revenue as the product of the value of an import flow times the tariff does not take into consideration that countries use tariff exemption, including for imports from governmental bodies, international agencies etc (see Brenton et al. (2009, p. 3_[55])). There is an aggregation bias owing to the fact that tariff data is reported and comparable only at the 6-digit level while many countries apply tariffs at the 8 or even 12 digit level.

The analysis is undertaken for 171 countries using the latest available year – Table 2. In line with most of the existing literature, three key results emerge from this exercise.

- **The overall revenue implications of the Moratorium are small.** The potential foregone customs revenue of the Moratorium is USD 1.3 billion. This represents, on average, around 0.68% of potential total customs revenue.⁴⁴
- **Revenue implications differ across income groups.** The potential revenue effects, although small, are on average more important, as a share of potential customs revenue, for countries in lower income groups.
- **There are important heterogeneities across countries.** Estimated potential foregone revenue for countries such as Malawi or Mongolia is higher, suggesting that specific economies might be particularly affected. For such cases, specific attention to possible fiscal adaptation strategies and capacity building is warranted.

Overall, and as a share of government revenue (albeit for a reduced sample of 131 countries), the average potential foregone customs revenue implications of the Moratorium range between 0.02% and 0.33% of overall government revenue.

Moreover, the growing adoption of 3D printing technologies is unlikely to drastically change these results. Recent evidence in Freund, Mulubdic and Ruta (2022^[24]; 2019^[25]) and Andrenelli and Lopez-Gonzalez (2021^[2]) suggests that 3D printing is complementary to goods trade rather than substitutive.

Table 2. Potential foregone customs revenue

- a. By income group and as a share of as potential overall customs revenue (171 countries), 2021 or latest available year

	Average MFN tariff	Average share of imports that is dutiable	Sum of potential foregone revenue (million USD)	Average share of foregone revenue in potential customs revenue*	Highest estimates of foregone revenue*	Number of countries where the estimate equals 0%
Low income	10.3%	87%	60	1.64%	Malawi (22%), Niger (3%); Mali (3%)	8 out of 22
Lower middle income	9.0%	72%	738	1.09%	Mongolia (22%); Sri Lanka (6%); Nepal (3%)	9 out of 43
Upper middle income	5.7%	60%	256	0.40%	Paraguay (3%); Fiji (3%); Azerbaijan (2%)	7 out of 47
High income	1.9%	53%	205	0.22%	UAE (2%); Bermuda (1%); Panama (1%)	10 out of 58
All countries	5.9%	64%	1,265	0.68%		

⁴⁴ Foregone customs revenue estimated in Banga (2022) is 6 times higher than these estimates in million USD, despite the analysis presented herein covering roughly twice as many countries. The estimates using bound rates in Banga (2022) are 16 times higher.

b. As a share of as overall government revenue (131 countries), 2021 or latest available year

F	Average MFN tariff	Average share of imports that is dutiable	Sum of potential foregone revenue (million USD)	Average share of foregone revenue in total government revenue	Highest estimates of foregone revenue*	Number of countries where the estimate equals 0%
Low income	11.7%	88%	54	0.33%	Malawi (2%); Central African Republic (0.7%); Togo (0.04%)	3 out of 12
Lower middle income	8.6%	73%	689	0.20%	Mongolia (3.6%); Congo, Rep. (0.9%); Nepal (0.4%)	6 out of 35
Upper middle income	5.7%	54%	253	0.06%	Paraguay (0.7%); Azerbaijan (0.3%); Fiji (0.2%)	6 out of 37
High income	1.7%	50%	42	0.01%	Bahamas (0%); Panama (0%); Trinidad and Tobago (0%)	9 out of 47
All countries	5.6%	61%	1,038	0.10%		

Note: Analysis for 171 and 131 countries, based data availability (including Venezuela when data allows, not classified under the 2022-2023 World Bank Income group classification); 2021 or latest available year. The variable 'potential customs revenue' is calculated by importing country as MFN tariff * import flow for all country-partner-product flows at the HS 6 digit level, for the same year as the foregone customs revenue estimate for digitisable goods. The government revenue variable comes from the World Development Indicators, computed as government revenue is local currency unit, scaled by the average exchange rate with the US dollar for the purpose of comparability. Where data is missing OECD revenue statistics for total government revenue are used instead. This estimate for government revenue is computed as a simple average across 2017-2020. Data from the UAE (High income) is omitted from Table 2b because of an exceptionally high estimate.

Source: Own calculations based on BACI, TAPED and TRAINS.

5.2. Potential revenue losses can be offset from rising VAT and GST takings

The debate on the Moratorium has mainly focused on the potential impact of digitalisation on the dematerialisation of physical trade and the associated potential customs revenue implications. However, relatively little attention has been given to the impact of digitalisation on new economic activities and trade flows and how non-discriminatory consumption taxes would help offset potential revenue losses from customs duties.⁴⁵ One notable exception is Lee-Makiyama and Narayanan (2019_[26]).

5.2.1. Trade that is 'born digital' is growing

The last decade has seen a significant increase in digital services imports across all income groups – in large part driven by computer services (See Section 4). Some of these digital services reflect economic activities that involve trade that is 'born digital' and that would not have been delivered through physical carrier media. Good examples of this are cloud computing services, interactive online gaming services, or services provided through smartphone applications.

⁴⁵ These new economic activities may also help offset the fiscal implications of the dematerialisation of trade through other taxes (e.g. personal or corporate income taxes). Similarly, many other activities beyond those used in this section (i.e. imports of computer, audio-visual and information services) would grow with digitalisation (e.g. financial services, business services). Yet, quantifying the contribution of these other mechanisms is more challenging in the current framework, which is why this section largely focuses on consumption taxes applied on computer, audio-visual and information services imports.

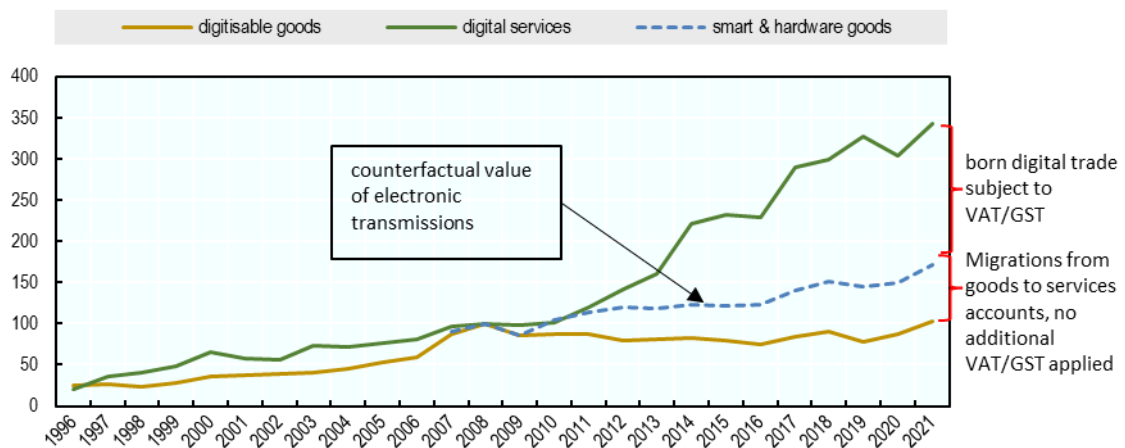
These trade flows provide a new tax base for consumption taxes, and as such can contribute to offsetting the fiscal implications arising from the dematerialisation of trade in digitisable goods. The extent to which this is the case will depend on the extent to which growth in these digital services imports has outpaced growth of hypothetical electronic transmissions (Figure 13a).

The intuition is as follows. The value of digital services imports captures both trade that has migrated from physical delivery to digital delivery (counterfactual electronic transmissions) as well as trade that was ‘born digital’. Since trade that may have shifted from physical to digital delivery would already have attracted VAT/GST taxes, the move from physical to digital delivery is neutral for VAT/GST collection.⁴⁶

However, growing imports of trade that is ‘born digital’ would generate new VAT/GST revenue, with the potential to offset foregone customs revenue. Overall, since, on average, the rate of growth of digital services imports is generally higher than that of counterfactual electronic transmissions, there is a potential tax base for these offsetting effects to take place (Figure 13b).

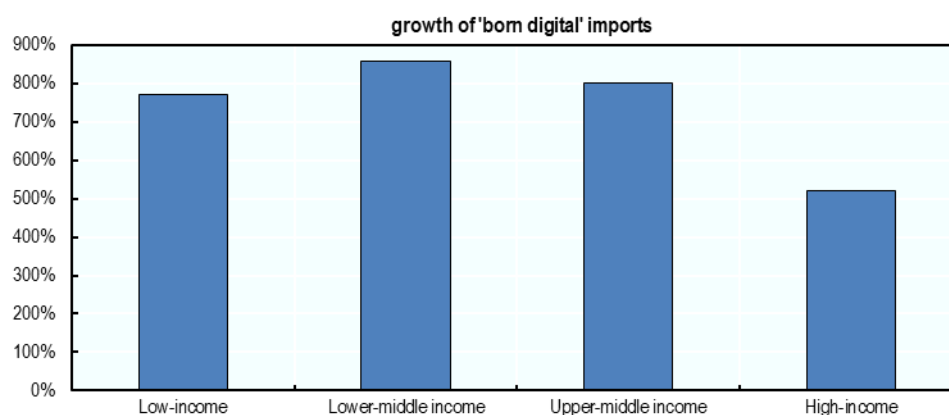
Figure 13. Estimating the benefits of consumption taxes on trade that is ‘born digital’

a. Imports of digital services outpaced the growth of ‘electronic transmissions’, 2008=100



⁴⁶ Although it has negative implications for revenue from customs duties.

- b. Difference between growth of counterfactual electronic transmissions and digital services, by income group (117 countries)



Note: Panel a shows normalised changes in imports of digitisable goods, electronic transmissions and digital services imports, with 2008 set equal to 100. Panel b shows how much more digital services imports have grown relative to the counterfactual for electronic transmissions.

Source: Own calculations based on TRAINS, BACI and UNCTAD-WTO trade in services statistics.

5.2.2. VAT/GST taxes are widespread across the globe

The potential offsetting effect of VAT/GST taxes depends on the existence of a VAT/GST regime in the importing country, the applicable rates and the taxable base. The vast majority of countries included in this analysis apply VAT/GST taxes, highlighting the widespread use of these mechanisms for fiscal revenue collection.⁴⁷ Where standard VAT/GST rates are concerned, the median rate is between 15 and 20%, depending on the income group.⁴⁸ VAT/GST rates range between 15% and 20% in low-income countries and 5% and 27% in high-income countries (Figure 14a).

VAT/GST taxes generally apply to domestic transactions as well as imports – they will be due upon importation only when digital services are used for final consumption. This means that only some digital services imports will directly generate consumption tax revenue when crossing a border. This will be the case for Business-to-Business (B2B) transactions where the importing entity (e.g. a firm) is the final consumer of the supplied service – or else for Business-to-Consumer (B2C) transactions.

The calculated tax base of ‘born digital’ imports needs to be scaled by the share of imports in these sectors that can be attributed to final demand. This is calculated using the TIVA database with information from years 2019 and 2020 on a country-by-country basis.⁴⁹ The data show that, on average, and notwithstanding strong variation across and within income

⁴⁷ VAT rates are available for 137 of the 171 countries in the dataset and are collected using a range of data sources including PwC, Avalara and KPMG. Missing data are also a reflection of the absence of a VAT system in the economy.

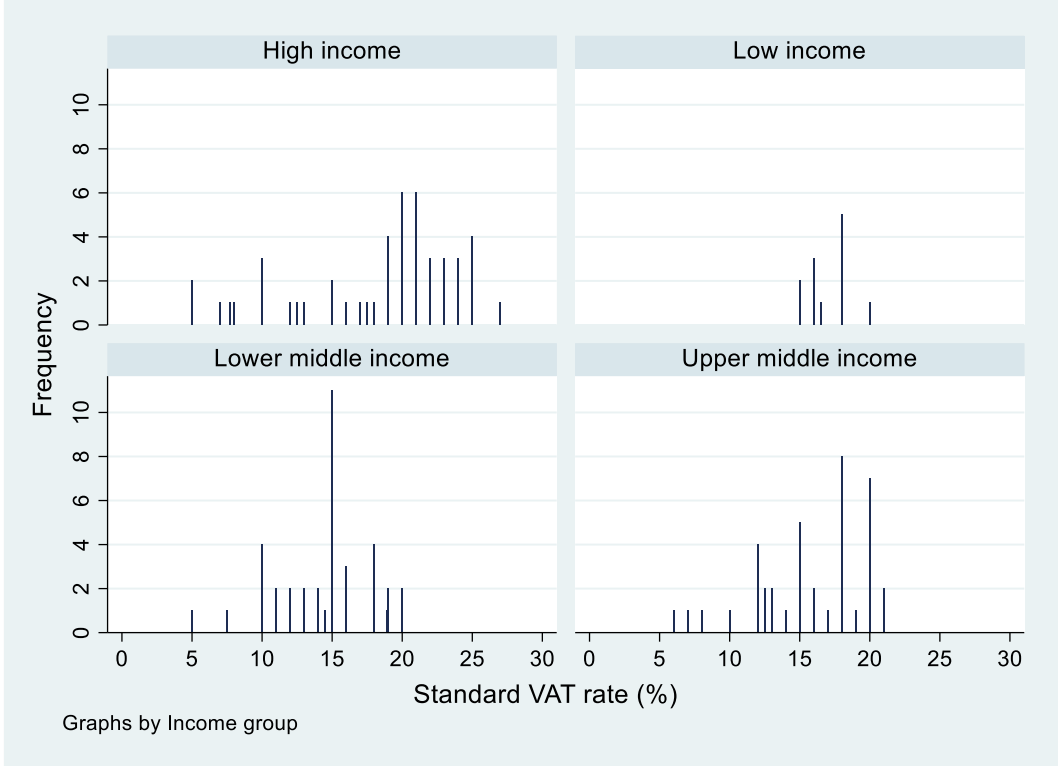
⁴⁸ A comparison of VAT rates specific to digital services imports (obtained from Avalara) and standard VAT rates (obtained from PwC) reveals that standard VAT rates normally apply to the importation of digital services.

⁴⁹ The relevant sectors for digital services imports mirror the Balance of Payment classification for digital services imports as audio-visual, information and computer services. These are Publishing, audio-visual and broadcasting activities (D58T60) and IT and other information services (D62T63).

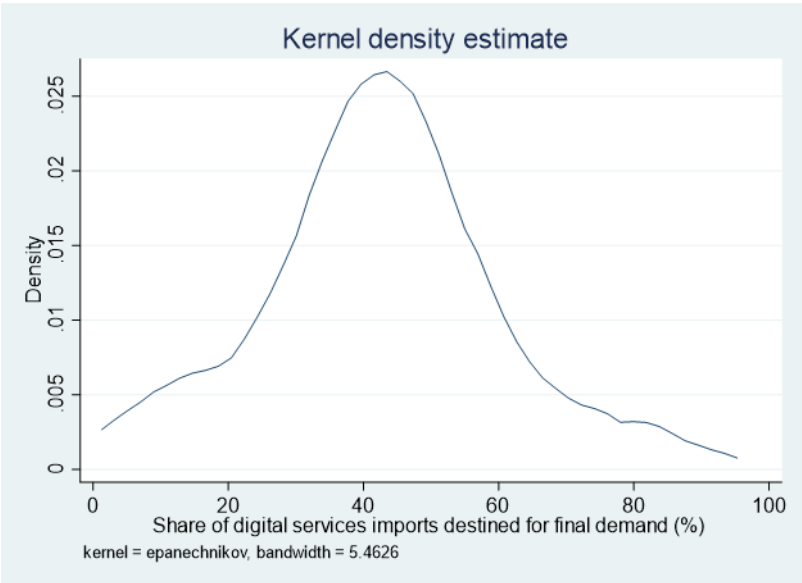
groups, around 44% of imports of digital services are destined for final demand. (Figure 14b).

Figure 14. Distribution of standard VAT rates and final demand shares

a. Distribution of standard VAT rates, by income group



b. Distribution of final demand share in digital services imports



Note: a. Based on 136 countries. b. based on 76 countries.
 Source: Own calculations based on PwC, Avalara, KPMG, IMF and TIVA.

5.2.3. The offsetting effects are important for a large number of countries

Revenue from VAT on ‘born digital’ trade is computed as the sum of the product of the import tax base for digital services (*ITBDS*), the share of these imports destined for final demand (*FCS*) and the applied VAT/GST rate (*VATGST*).⁵⁰

$$RFVAT_{it} = \sum (ITBDS_{it} * FCS_{it} * VATGST_{it})$$

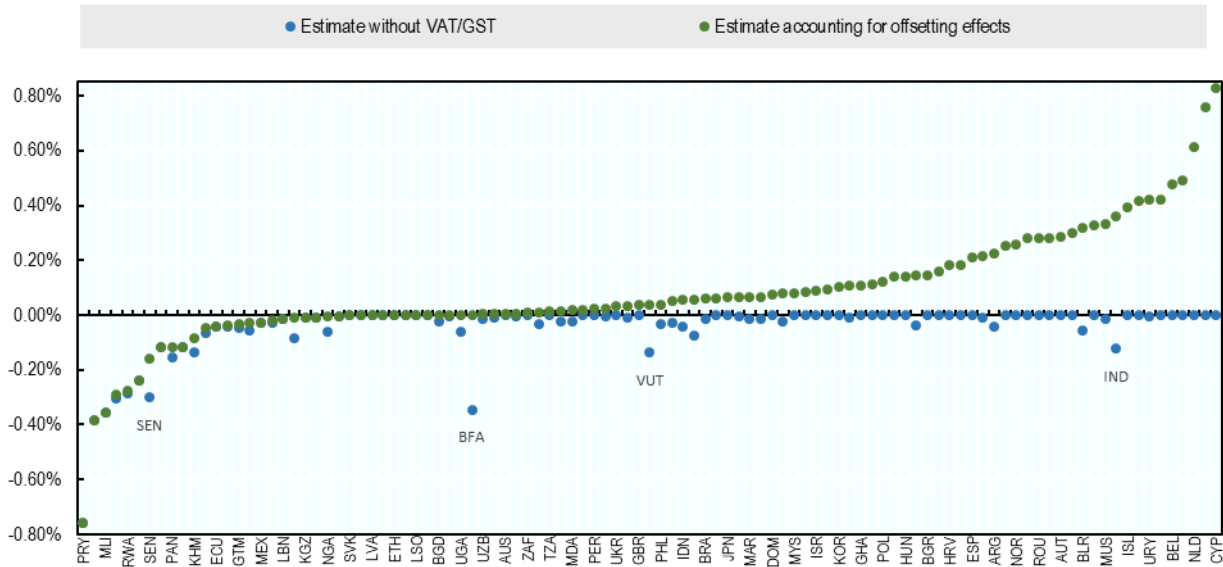
The exercise shows that – for 77 out of the 106 countries for which data is available – standard VAT/GST rates applied to growing imports of ‘born digital’ services are likely to generate more revenue than the foregone customs revenue attributable to the e-commerce Moratorium (Figure 15). Where these taxes might not fully offset the potential impact of the Moratorium, they would, in most cases, attenuate the fiscal implications of the dematerialisation of trade – although this is not the case for all countries. Indeed, for 29, mostly developing countries, the net fiscal impact remains negative – although small relative to overall government revenue. Importantly, offsetting effects of consumption taxes arise across all income categories (Figure 15). Moreover, these estimates are only based on imports of audio-visual, information and computer services, and as such they only capture a fraction of VAT/GST revenue that may be generated by the wider growth of services imports. Indeed, VAT/GST would also be collected on other goods and services which are beyond the scope of this exercise.

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 not only to address tax challenges associated with the digital transformation, but also a demonstrated capacity to increase tax revenues (Box 5). They also do not have the 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).

⁵⁰ Scaling by the final demand share may lead to an underestimation of VAT revenue generated by digital services imports, as business-to-business transactions where the importing business is not the final consumer are still likely to generate additional VAT/GST revenue through their further sales in domestic value chains. The share of VAT revenue generated through these sales is however harder to quantify and is therefore not included in this exercise.

Figure 15. Standard VAT/GST taxes applied on digital services imports would offset in most countries the fiscal revenue effects of the Moratorium

Difference between estimates that exclude the offsetting effects of VAT/GST relative to estimates that include them, as a share of government revenue. Individual dots represent countries, 2021 or latest available year.



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. The figure excludes Mongolia (-3.48%), Malawi (-1.57%) and Estonia (+3.02%) for representation purposes.

Source: Own calculations based on BACI, UNCTAD-WTO trade in services statistics, TRAINS, PwC, Avalara, KPMG, World Development Indicators and OECD Tax Revenue Statistics.

Box 5. Addressing the VAT Challenges of Digital Trade: delivering an effective global solution

Growth in digital trade has created considerable pressures on VAT. For instance, increasing values of online sales of services, including applications, music and video-streaming, often do not incur VAT taxes. This is largely due to complexities in organising, administering and enforcing the payment of the tax on these sales under traditional VAT rules.

The absence of a robust response to these challenges can lead to increasingly significant VAT revenue losses and growing unfair competitive pressure on brick-and-mortar retailers that are increasingly incapable of competing against the continuously rising volumes of online sales, where VAT is not being levied. This issue has become even more important now that the COVID-19 pandemic accelerated a further shift from bricks-and-mortar businesses to online sales.

An effective global solution based on international dialogue

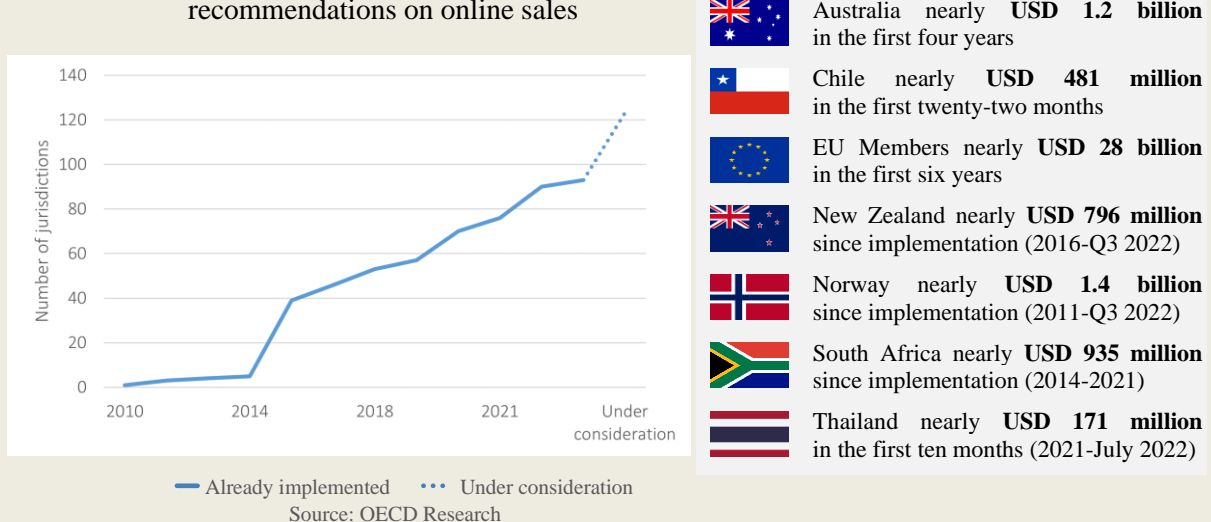
The global policy dialogue organised by the OECD in response to these challenges identified internationally agreed rules and mechanisms to address the VAT challenges of digital trade. They allow governments to secure important VAT revenues on e-

commerce and to ensure a level playing field between e-commerce and traditional businesses, without stifling innovation and economic growth. These solutions were developed in an inclusive manner, notably through the Global Forum on VAT, and reflect consensus among more than 100 jurisdictions worldwide. They were delivered as part of the OECD/G20 Base Erosion and Profit Shifting (BEPS) package and have been further complemented with detailed implementation guidance (OECD, 2017^[27]; 2019^[28]).

A growing number of jurisdictions have implemented the recommended solution with very positive results

Over 90 jurisdictions worldwide, including OECD and non-OECD countries, have already implemented the recommended rules and mechanisms for collecting VAT on online sales, and many more are planning to do so. Very positive results have been reported in terms of additional revenue collected and in achieving a level playing field between bricks-and-mortar businesses and online merchants.

Jurisdictions adopting the VAT recommendations on online sales



Regional VAT Digital Toolkits

The OECD provides assistance to jurisdictions worldwide, including developing economies, to help implement the recommended solutions for the effective collection of VAT on digital trade. Indeed, the Regional VAT Digital Toolkits present detailed guidance for the design, administrative and operational implementation of the recommended framework for the collection of VAT on digital trade. Three Regional Toolkits have been delivered for Latin America and the Caribbean (2021^[29]), Asia-Pacific (2022^[30]) and (2023^[31]), taking account of each region's specific needs and circumstances. They cover all the key implementation and operational aspects including policy design and legislative reform, building the infrastructure to support the registration and compliance processes, communication strategy, effective audit and administrative risk management strategies, including concrete measures to tackle VAT fraud associated with online trade.

Note: See also the OECD International VAT/GST Guidelines (OECD, 2017^[27]) and the 'The Role of Digital Platforms in the Collection of VAT/GST on Online Sales' (OECD, 2019^[28]).

6. Identifying the potential implications of not renewing the Moratorium

Understanding the implications of the Moratorium requires looking beyond its potential fiscal impacts and identifying some of the benefits that would be foregone with the lapse of the Moratorium. Indeed, previous OECD work (Andrenelli and López González, 2019^[1]) showed that.

Electronic transmissions could help level the playing field, in terms of trade costs, for developing countries which tend to face higher trade costs on physical products than high-income countries. Developing countries would compete on a more even keel with developed countries given that costs of transmitting items digitally would be similar across countries at different levels of development.

Removing existing tariffs on digitisable goods would lead to an overall positive welfare impact. Analysis from a partial equilibrium model shows that, if all goods that could be digitised were to become digitally transmitted today, consumer welfare would increase by USD 940 million, outweighing potential revenue losses by USD 73 million.

The use of foreign business services, which are increasingly digitally delivered, is associated with growing export competitiveness – Access to business services was found to be most important for lower-middle income and lower income countries.

Debates about the opportunity cost of the Moratorium often focus on the following three areas.⁵¹ The first is the potential impact of tariffs and trade policy uncertainty and what the lifting of the Moratorium might mean for trade in electronic transmissions. The second is about industrial policy, and whether there might be a case for tariffs on electronic transmissions with a view to spurring greater domestic value creation. The last is on the impact that lifting the Moratorium might have on the most vulnerable businesses, including SMEs and women-owned firms.

6.1. Trade policy uncertainty reduces trade

Since the Moratorium has been in place, digital trade, which includes digitally ordered and digitally delivered trade, has thrived, growing from USD 1.26 trillion in 1998 to USD 5.1 trillion in 2018. For countries like the United Kingdom, the United States, India or the Philippines, digital trade now represents more than a third of total exports (López-Gonzalez, Sorescu and Kaynak, 2023^[32]). While many different factors will have contributed to the expansion of digital trade, lower trade costs and reduced trade policy uncertainty are two which are likely to be particularly important in the context of the Moratorium discussions.

Indeed, existing empirical literature highlights that one key benefit from trade agreements is reduced trade policy uncertainty, especially for lower income countries (Limao and Maggi, 2015^[33]). On the specific case of tariffs, Osnago, Piermartini and Rocha (2015^[34]) show that trade policy uncertainty, measured as the difference between bound and applied tariff rates – the water in the tariff – is an important barrier to exports. In the face of tariffs and policy uncertainty, firms delay or reduce their trading activities. Jakubik and Piermartini (2023^[35]) argue that commitments made at the WTO can contribute to more stable policy environments.

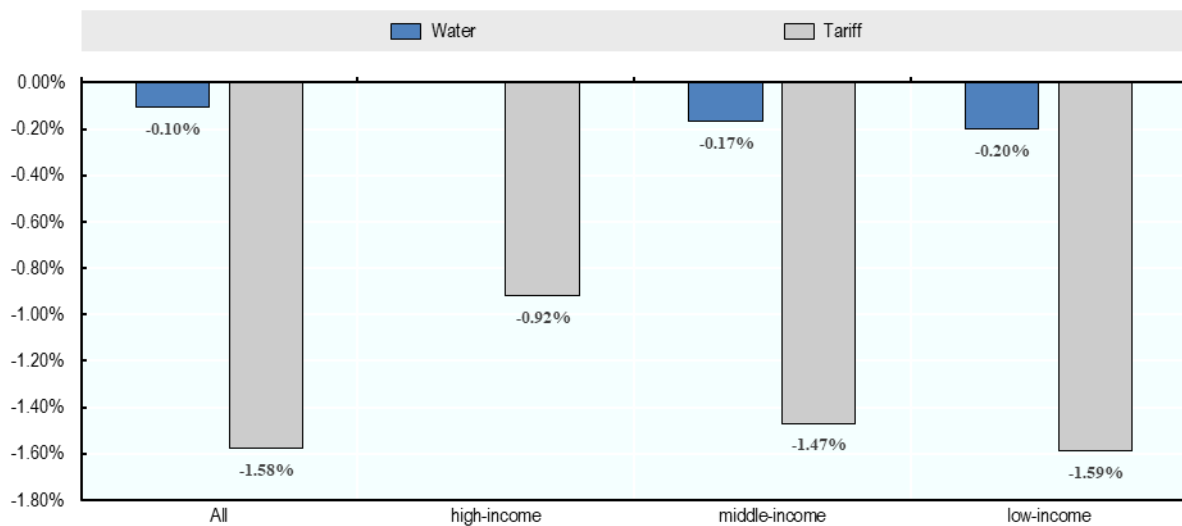
⁵¹ These, among others, were highlighted during a meeting held at the WTO on the 2nd of June 2023 during a dedicated session on the Moratorium under the e-commerce Work Programme discussions (https://www.wto.org/english/tratop_e/ecom_e/ecom_0106202310_e/ecom_0106202310_e.htm).

Identifying how the moratorium has affected trade policy uncertainty is difficult because there is no policy change that can be used to capture a direct effect. However, looking at how policy uncertainty has affected trade in physically traded items related to electronic transmissions (i.e. digitisable goods) can provide valuable insights about potential effects. If uncertainty about the trade policy environment already affects digitisable goods trade, not renewing the moratorium could entail the transpositions of this policy uncertainty to electronic transmissions.

To capture the impact of tariffs and trade policy uncertainty on digitisable goods the methodology set out in Osnago, Piermartini and Rocha (2015^[34]) is used. A negative relationship between digitisable goods trade and the existing tariff rate and the difference between the bound and the MFN rate, the water in the tariff, emerges (Figure 16). Overall, an increase in trade policy uncertainty, measured as a one percentage point change in the water in the tariff, leads to a further reduction of trade by 0.1% (in parallel, a one percentage point increase in the tariff on digitisable goods leads to a 1.58% decrease in trade).

These results confirm that trade policy uncertainty plays an important role in determining trade in digitisable goods. They also highlight that the impact of trade policy uncertainty is largest for low-income countries, followed by middle income countries. It is worth noting that this trade policy uncertainty effect is not apparent in the case of related digital services (where electronic transmissions are captured in the trade statistics). As expected, neither the tariff nor the water in the tariff have a statistically significant impact on digital services (see Annex Table D.1). This in line with the hypothesis that the Moratorium is keeping a lid on trade policy uncertainty that is affecting digitisable goods.

Figure 16. Trade policy uncertainty reduces trade in digitisable goods



Note: The bars show the coefficients observed from structural gravity model that regresses trade in digitisable goods against tariffs and the water in the tariff (the difference between applied and bound rates). The estimations also control for the presence of FTAs and use country pair, reporter-year, partner-year and sector fixed effects. Sample period is 1995-2020. Table of regression results can be found in Annex Table D.1.

Source: Own calculations based on TRAINS data.

6.2. Lifting the Moratorium would hit low-income country trade most

One question that is often asked relates to the potential impact of lifting the Moratorium and applying tariffs on electronic transmissions. This can be illustrated by applying the coefficients obtained from the estimations in the previous section to existing digital services trade, which is where electronic transmissions are currently recorded (see Box 2).⁵² The results show that the transposition of tariffs currently applied on digitisable goods to digital services would reduce low-income country exports of digital services by 2.5%, exports of middle-income countries by 0.4% and exports of high-income countries by 0.5% (Figure 17a).⁵³ For greater clarity, this reflects both the impact of greater uncertainty and of countries applying the same duties that are imposed on digitisable goods on digital services.

The higher impact on low-income countries is driven by the fact that 84% of low-income country digital services exports are currently to middle-income countries which tend to have higher applied and bound tariffs, fewer RTA commitments, and fewer NICDET and GATS commitments. In turn, middle income countries tend to export more to high-income countries where there are more commitments not to apply tariffs (Table 3).

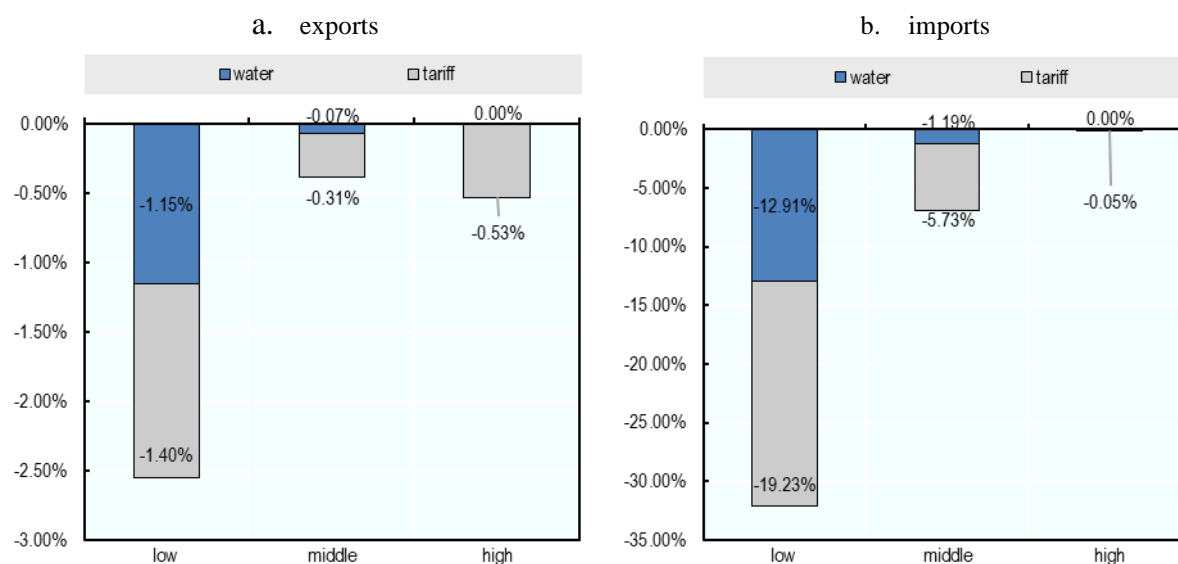
For imports (Figure 17b), the impact would be even more marked. Low-income country imports of digital services stand to fall by 32%, middle-income country imports by nearly 6% and high-income country imports by 0.04%. These results are driven by the fact that low-income countries tend to have high tariffs on digitisable goods, while high-income countries have near zero tariffs.

⁵² The impact of the tariffs and uncertainty is obtained by multiplying the value of trade in digital services (x_{ij} or m_{ij}) between two countries by the coefficient obtained for the income group in which the reporting country belongs to from Table D.1 (inc_group_beta), multiplied by either the water in the tariff ($water$) or the applied tariff ($AHSrate$). See Annex D for a description.

⁵³ These calculations take into consideration existing preferences in RTAs and NICDET commitments although not GATS commitments (which were difficult to operationalise for this type of analysis). If these are not taken into account the impact would be reductions in low-income country exports of 9% and 32% in imports. For middle income, exports would fall by 0.5% and imports by 8%. For high income, these exports would fall by 0.7% and imports by 0.1%. These differences reflect the fact that high-income countries absorb much trade in services and they currently offer strong preferences for many developing countries.

Figure 17. Tariffs on digital services would reduce trade significantly, especially in low-income countries

Potential implications of introducing tariffs and uncertainty on services trade 2019



Note: The calculation is based on applying the tariff and uncertainty coefficients from digitisable goods to digital services.
Source: own calculations using ITPDE database

Table 3. Trade in digital services by income level

Share of row nation imports and exports 2019 and tariffs faced

	a. exports to		
	Low-income	Middle-income	High-income
Low-income	5.6%	84.2%	10.3%
Middle-income	0.7%	5.5%	93.8%
High-income	0.5%	11.5%	87.9%
	b. imports from		
	Low-income	Middle-income	High-income
Low-income	0.1%	14.1%	85.8%
Middle-income	0.0%	5.4%	94.5%
High-income	0.0%	11.4%	88.6%

Note: Panel A shows share of exports from row nation to column nation as share of total exports. The first entry shows that 5.6% of low income country exports are destined to low income countries. Panel b does the same for imports.
Source: Own calculations using ITPDE database

Overall, these results suggest that there are potentially important trade losses associated with charging tariffs on digital services, including for access to imported digital inputs. Potential losses would concentrate in developing countries, both in terms of exports and imports given the structure of their trade and tariffs.

6.3. Tariffs on electronic transmissions would reduce domestic competitiveness

A key channel through which firms can benefit from electronic transmissions is through the input channel. Businesses have been adopting digital solutions, such as software or computer services (whether imported via physical carrier media or digitally), often sourced from abroad, to enable their digital transformation.

Existing empirical evidence already shows that access to digitally deliverable business services from abroad can lead to growing domestic value added in exports (Andrenelli and López González, 2019^[11]). More recently, work by Narayanan (2023^[36]) also highlights the positive impact of digital inputs on gross value added of Indian SMEs. However, there is, to date, no more systematic analysis on the role of digital services and digitisable goods on domestic competitiveness across countries at different levels of development. This is important because it gets to the question of industrial policy. If foreign digital inputs are strongly linked to domestic competitiveness, then there is a case for ensuring duty-free access to those inputs.

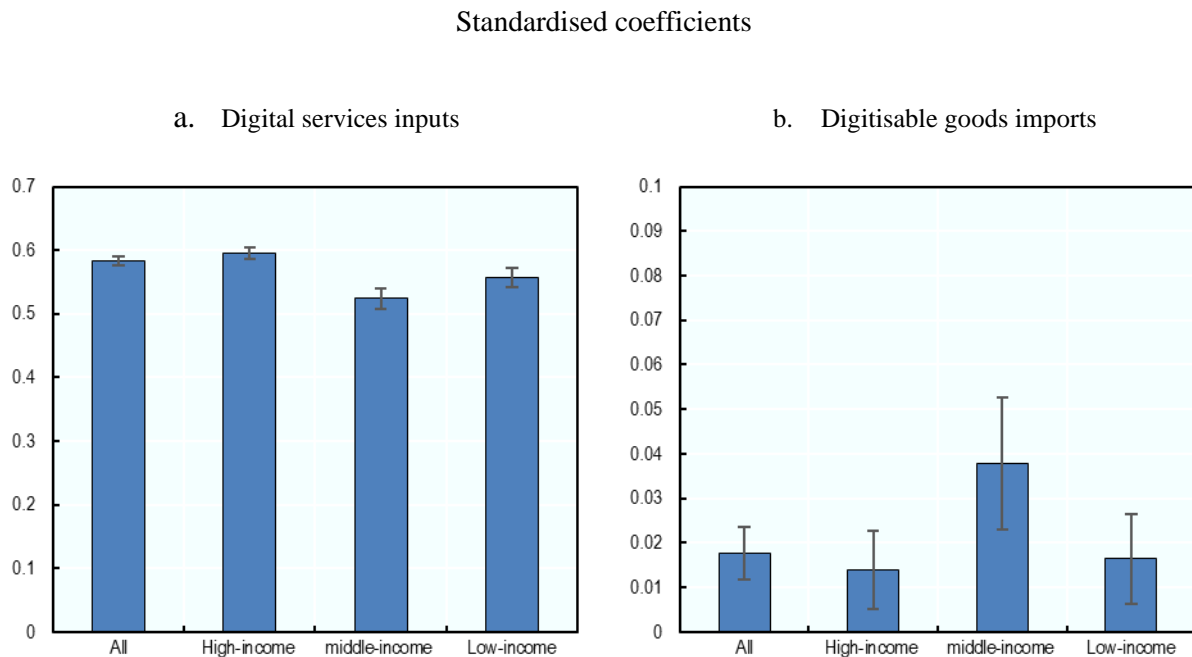
Using a similar framework to that of Andrenelli and López-González (2019^[11]), the use of imported digital services inputs and of digitisable goods is found to make a statistically significant contribution to domestic value addition and therefore competitiveness.⁵⁴ This is true across countries at all levels of development (with small differences across these).⁵⁵ Access to foreign digital services inputs, which would include internationally sourced software solutions as well as different types of computer services are important enablers of domestic and international competitiveness (Figure 18a).

Moreover, when introducing overall imports of digitisable goods (lagged by one year to avoid mechanical correlations), a positive relationship also emerges (still controlling for digital services imports). That is, imports of digitisable goods, which also include content like software solutions but delivered via a physical carrier medium, also have a positive impact on domestic competitiveness.

Overall, these results imply that any trade cost increases, whether it be on digitisable goods or on digital services, would lead to reduced domestic value added and therefore competitiveness, affecting local production and employment. There is a self-interest case for maintaining a duty-free environment for electronic transmissions.

⁵⁴ This is measured as the domestic value added in final consumption which captures the value added generated by firms located domestically. It is a broader measure than the domestic value added in exports which was used in (Andrenelli and López González, 2019^[11])

⁵⁵ The analysis controls for existing degrees of engagement in GVCs, for differences in capital labour ratios, per capita GDP as well as political stability, FDI inflows and digital connectivity.

Figure 18. Digital inputs are key determinants of domestic competitiveness

Note: Figure shows the standardised regression coefficients with their confidence intervals (95%). See Annex D for results table and model specification.

Source: Own calculations based on TRAINS and ITPDE.

6.4. Smaller and women owned firms could be most impacted from tariffs on electronic transmissions

Electronic transmissions also play a strong role in helping smaller and women-led businesses reach global suppliers and customers. SMEs make up the majority of enterprises and employ most of the domestic workforce in developed and developing countries, yet, in relative terms, they represent a low share of value added and exports (López González and Sorescu, 2019^[37]; WTO, 2018^[38]; WTO, 2016^[39]). This is because SMEs tend to be less productive than larger firms, they have more limited access to capital markets for investment in new technologies, and they tend to find it harder to attract and retain talent (WTO, 2016^[39]). Women-led firms are also fewer, smaller, younger and less well financed than those led by men (Korinek, Moïsé and Tange, 2021^[40]).

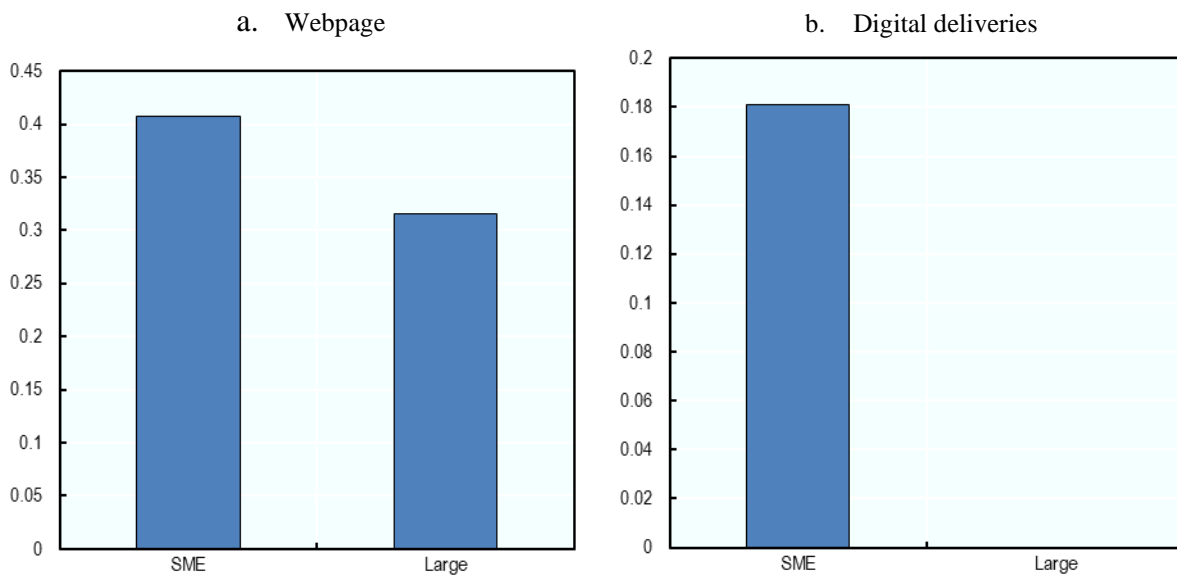
However, changes in the global trading landscape, including the digital transformation, offer SMEs and women-led businesses new opportunities to integrate and benefit from the global economy. Those that leverage digital technologies are likely to be better able to face trade costs which tend to represent a higher share of the products they ship relative to larger firms. In many ways, digitalisation and being able to deliver trade digitally levels the uneven playing field between smaller and larger firms.

Analysis using the World Bank Enterprise Survey (WBES), which largely covers developing countries, suggests that smaller firms have a lower propensity to export. Nevertheless, econometric analysis, albeit of a cross-sectional nature, suggest that those

that use digital tools like webpages have higher propensities to export (Figure 19a).⁵⁶ Moreover, being able to deliver trade digitally is found to be associated with higher propensities to export of smaller firms and not larger ones (Figure 19b). Lastly, when looking across the gender aspect of ownership, the results show that women-owned SMEs that use webpages also tend to have a higher propensity to export than male-owned firms that use webpages (Figure 20). While not directly tied to tariffs on electronic transmissions, the results show that digital tools are key for inclusive trade. By proxy, increasing costs to access or engage in digital trade is likely to impact these firms most.

Figure 19. Smaller firms benefit more from digital deliveries than larger firms

Impact of use of digital tools on propensity to export



Note: Dependent variable is whether or not a firm is an exporter. SMEs are defined as businesses with less than 100 employees. See Annex D for full results.

Source: Own calculations using World Bank Enterprise Survey, extracted July 2023.

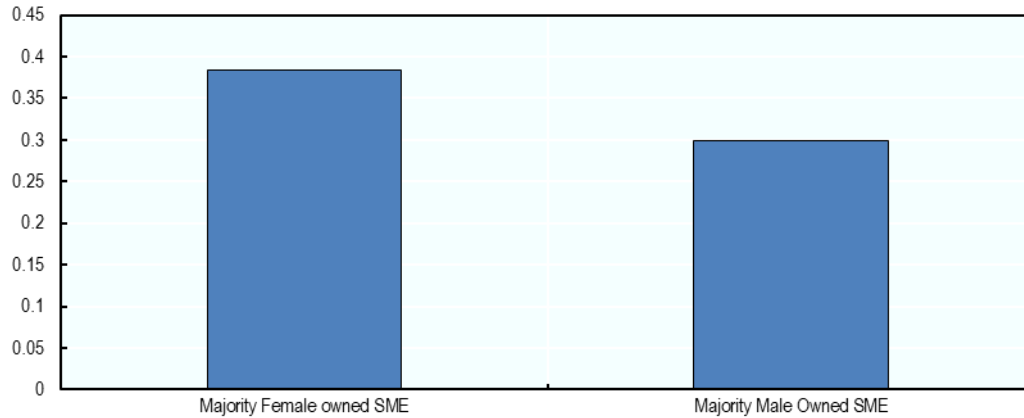
The use of digital tools is not limited to higher propensities to trade; firms that use webpages are also seen to be more productive and employ more workers, including female workers (Figure 20).⁵⁷ SMEs that use webpages are also seen to employ more female workers than larger firms (Figure 21a). They are also more productive (Figure 21b).

⁵⁶ Having a webpage often involves the purchase of a digital service through which the webpage is designed, and the purchase of hosting space online. The lapse of the Moratorium could affect businesses ability to access such services.

⁵⁷ Small sample issues made it difficult to also look at the impact of digital deliveries.

Figure 20. Women owned SMEs benefit more from use of digital tools than male owned SMEs

Impact of use of webpage on propensity to export

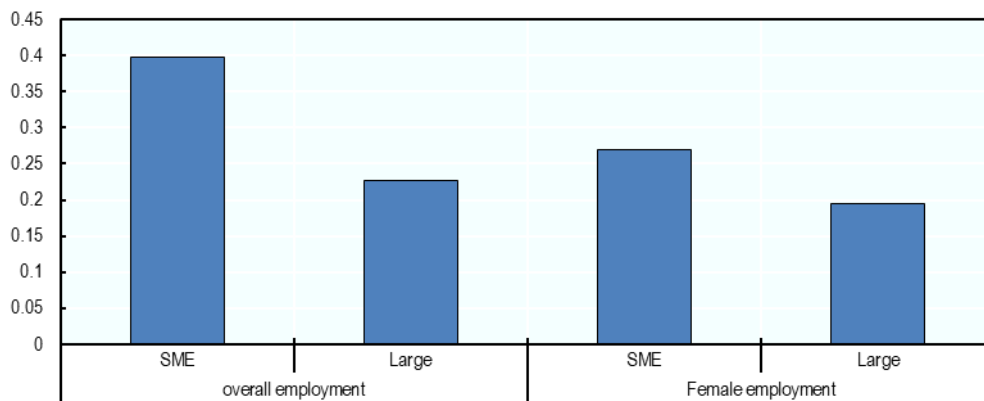


Note: Dependent variable is whether or not a firm is an exporter. SMEs are defined as businesses with less than 100 employees. Female owned firms are those where female ownership is above 50%. See Annex D for full results.
Source: Own calculations using World Bank Enterprise Survey, extracted July 2023.

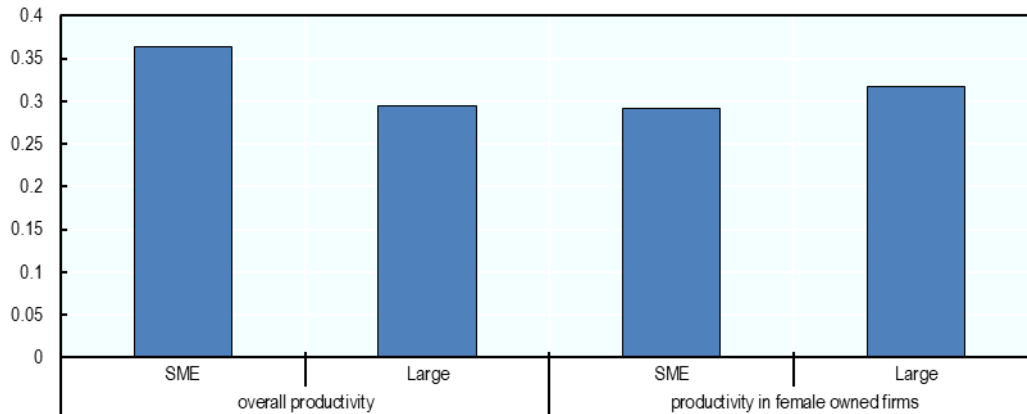
SMEs that use webpages are also seen to employ more female workers than larger firms (Figure 21a). They are also more productive (Figure 21b).

Figure 21. Digitalisation is associated with more employment, including for women

a. Impact of using webpages on employment



b. Impact of using webpages on productivity



Note: Dependent variable is employment in panel a and productivity, measured as output per worker in panel b. SMEs are businesses with less than 100 employees. Female owned firms are those where female ownership is above 50%. See Annex D for full results.

Source: Own calculations using World Bank Enterprise Survey, extracted July 2023.

7. Policy observations

The Moratorium, which is the only WTO provision that specifically targets e-commerce, has supported an environment that has enabled digital trade to thrive. Beyond providing guarantees that digital transactions will not attract tariffs, it has also kept a lid on a number of potentially conflictual trade policy issues. While some consider the lack of precision of the e-commerce Moratorium as a challenge, it can also be seen as a strength, as it allows multiple views to co-exist.

The analysis presented herein has shown that language in trade agreements can provide helpful information for discussions about the scope of the moratorium and the definition of electronic transmissions. It has also highlighted that the potential customs revenue implications of the Moratorium are small, amounting to USD 1.3 billion (for 171 countries). This represents a country average of 0.68% of potential total customs revenue. As a share of government revenue, and for a sample of 131 countries across different income levels, this is 0.1% of total revenue. These potential losses are also likely to be completely offset through fiscal revenue from GST and VAT taxes when these apply to digital services imports.

Getting to grips with the potential impact of the Moratorium also requires looking beyond its potential fiscal implications and identifying the benefits of the Moratorium or the potential costs associated with its lapse. The analysis presented herein suggests that the lapse of the Moratorium could generate trade policy uncertainty that would reduce trade. It shows that applying tariffs on electronic transmissions is likely to harm efforts to make trade more inclusive, whether it be low-income country exports, or the exports of smaller or women-owned firms. Last, it shows that tariffs on electronic transmissions would compromise domestic competitiveness, making critical digital inputs more expensive.

Overall, the analysis suggests that, given low potential fiscal costs and potentially large benefits, there is a strong case for the Moratorium to be renewed.

References

- Andrenelli, A. and J. López González (2019), “Electronic transmissions and international trade - shedding new light on the moratorium debate”, *OECD Trade Policy Papers*, No. 233, OECD Publishing, Paris, <https://doi.org/10.1787/57b50a4b-en>. [1]
- Andrenelli, A. and J. Lopez-Gonzalez (2021), “3D printing and International Trade: What is the evidence to date?”, *OECD Trade Policy Papers*, No. 256, OECD Publishing, Paris,, <https://doi.org/10.1787/0de14497-en>. [2]
- Banga, R. (2022), “WTO Moratorium on Customs Duties on Electronic Transmissions: How much tariff revenue have developing countries lost?”, *South Centre Research Paper 157*. [23]
- Banga, R. (2019), “Growing Trade in Electronic Transmissions: Implications for the South”, *UNCTAD Research Paper*, No. 29, UNCTAD, Geneva. [22]
- Banga, R. and R. Kozul-Wright (2020), “Moratorium on Electronic Transmissions: Fiscal Implications and Way Forward”, *UNCTAD/SER.RP/2020/6*, No. 47, UNCTAD. [7]
- Brenton, P. et al. (2009), “Assessing the Adjustment Implications of Trade Policy Changes using the Tariff Reform Impact Simulation Tool (TRIST)”, *Policy Research Working Papers*, No. 5045, World Bank, Washington, <https://doi.org/10.1017/S1474745610000509>. [55]
- Burri, M. and R. Polanco (2020), “Digital Trade Provisions in Preferential Trade Agreements: Introducing a New Dataset”, *Journal of International Economic Law*, Vol. 23/1, pp. 187-220, <https://doi.org/10.1093/jiel/jgz044>. [8]
- Burri, M., M. Vásquez Callo-Müller and K. Kugler (2022), *TAPED: Trade Agreement Provisions on Electronic Commerce and Data*, <https://www.unilu.ch/en/faculties/faculty-of-law/professorships/burri-mira/research/taped/>. [9]
- Evenett, S. (2021), “Is the WTO Moratorium on customs duties on e-commerce depriving developing countries of much needed revenue?”, *St Gallen Endowment for Prosperity through Trade*. [17]
- Freund, C., A. Mulabdic and M. Ruta (2019), *Is 3D Printing a Threat to Global Trade? The Trade Effects You Didn't Hear About*, <http://documents1.worldbank.org/curated/en/152701569432061451/pdf/Is-3D-Printing-a-Threat-to-Global-Trade-The-Trade-Effects-You-Didnt-Hear-About.pdf> (accessed on 18 May 2021). [25]
- Freund, C., A. Mulubdic and M. Ruta (2022), “Is 3D printing a threat to global trade? The trade effects you didn't hear about”, *Journal of International Economics*, Vol. Volume 138, <https://doi.org/10.1016/j.jinteco.2022.103646>. [24]
- IMF-OECD-UNCTAD-WTO (2023), *Handbook on Measuring Digital Trade: second edition*, <https://doi.org/10.1787/ac99e6d3-en>. [15]
- International Monetary Fund (2009), *Balance of payments and international investment position manual*, International Monetary Fund. [12]
- Jakubik, A. and R. Piermartini (2023), “How WTO commitments tame uncertainty”, *European Economic Review*, Vol. Volume 157, <https://doi.org/10.1016/j.eurocorev.2023.104495>. [35]

- Köhler-Suzuki, N. (2020), *New evidence on the impact of customs duties for digitizable products and electronic transmissions: the cases of Egypt and Vietnam*, [18]
<https://doi.org/10.13140/RG.2.2.13986.86726>.
- Korinek, J., E. Moisé and J. Tange (2021), “Trade and gender: A Framework of analysis”, *OECD Trade Policy Papers*, No. 246, OECD Publishing, Paris,, <https://doi.org/10.1787/6db59d80-en>. [40]
- Lee-Makiyama, H. and B. Narayanan (2019), “The Economic Losses from Ending the WTO Moratorium on Electronic Transmissions”, *Policy Brief*, No. 3, European Centre for International Political Economy, Brussels. [26]
- Limao, N. and G. Maggi (2015), “Uncertainty and Trade Agreements”, *American Economic Journal: Microeconomics*, Vol. 4/7, pp. 1-42, <https://doi.org/DOI: 10.1257/mic.20130163>. [33]
- López González, J. and S. Sorescu (2019), “Helping SMEs internationalise through trade facilitation”, *OECD Trade Policy Papers*, No. 229, OECD Publishing, Paris,, <https://doi.org/10.1787/2050e6b0-en>. [37]
- Lopez-Gonzalez, J. (2016), “Using Foreign Factors to Enhance Domestic Export Performance: A Focus on Southeast Asia”, *OECD Trade Policy Papers*, No. 191, OECD Publishing, Paris,, <https://doi.org/10.1787/5jlpq82v1jxw-en>. [51]
- López-Gonzalez, J., S. Sorescu and P. Kaynak (2023), “Of bytes and trade: quantifying the impact of digitalisation on trade”, *OECD Trade Policy Papers*, No. 273, OECD Publishing, Paris,, <https://doi.org/10.1787/11889f2a-en>. [32]
- Mattoo, A., R. Perez-Esteve and L. Schuknecht (2001), “Electronic commerce, trade and tariff revenue: A quantitative assessment”, *World Economy*, Vol. 24/7, pp. 955-970, <https://doi.org/10.1111/1467-9701.00391>. [21]
- Mattoo, A. and L. Schuknecht (2000), “Trade Policies for Electronic Commerce”, *Policy Research Working Paper*, No. 2380, The World Bank, Washington. [20]
- Narayanan-Gopalakrishnan, B. (2023), *The Impact of Cross-Border Digital Transmissions on the MSME Sector in India and the Benefits of the WTO e-commerce Moratorium*. [36]
- Nemoto, T. and J. López-González (2021), “Digital trade inventory: Rules, standards and principles”, *OECD Trade Policy Papers*, Vol. No. 251/OECD Publishing, <https://doi.org/10.1787/9a9821e0-en>. [56]
- OECD (2022), *Digital Trade Review of Brazil*, OECD Publishing, Paris, <https://doi.org/10.1787/0b046dfe-en>. [50]
- OECD (2022), “The Case for the E-Commerce Moratorium”, *OECD Trade Policy Brief*, https://issuu.com/oecd.publishing/docs/moratorium_policy_brief (accessed on 20 January 2023). [3]
- OECD (2019), *The Role of Digital Platforms in the Collection of VAT/GST on Online Sales*, OECD, Paris, <http://www.oecd.org/tax/consumption/the-role-of-digital-platforms-in-the-collection-of-vat-gst-on-online-sales.pdf>. [28]
- OECD (2017), *International VAT/GST Guidelines*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264271401-en>. [27]
- OECD/WBG/ADB (2022), *VAT Digital Toolkit for Asia-Pacific*, OECD, Paris, <https://www.oecd.org/tax/consumption/vat-digital-toolkit-for-asia-pacific.htm> (accessed on 17 May 2023). [30]

- OECD/WBG/ATAF (2023), *VAT Digital Toolkit for Africa*, OECD, Paris, [31]
<https://www.oecd.org/tax/consumption/vat-digital-toolkit-for-africa.htm> (accessed on 17 May 2023).
- OECD/WTO/IMF (2019), “Handbook on Measuring Digital Trade”, No. SDD/CSSP/WPTGS(2019)4, [14]
<https://www.oecd.org/sdd/its/Handbook-on-Measuring-Digital-Trade-Version-1.pdf> (accessed on 14 September 2021).
- OECD; WBG; CIAT; IDB (2021), *VAT Digital Toolkit for Latin America and the Caribbean*, OECD, [29]
 Paris, <https://www.oecd.org/tax/consumption/vat-digital-toolkit-for-latin-america-and-the-caribbean.htm> (accessed on 17 May 2023).
- Osnago, A., R. Piermartini and N. Rocha (2015), “Trade policy uncertainty as barrier to trade”, *WTO* [34]
Working Paper ERSD-2015-05, https://www.wto.org/english/res_e/reser_e/ersd201505_e.pdf.
- Schuknecht, L. and R. Pérez-Esteve (1999), “A Quantitative Assessment of Electronic Commerce”, *Staff* [19]
Working Paper ERAD, No. 01, WTO, Geneva.
- UN Department of Economic and Social Affairs (2015), “Central Product Classification (CPC) Version [13]
 2.1”, *M*, No. 77, United Nations Department of Economic and Social Affairs: Statistics Division, New York.
- UN Statistics Division (2011), *International merchandise trade statistics : concepts and definitions 2010*, [11]
 United Nations.
- WTO (2023), *Global Trade Outlook and Statistics*, World Trade Organisation, [6]
https://www.wto.org/english/res_e/booksp_e/trade_outlook23_e.pdf.
- WTO (2022), “Indonesia’s perspective on customs duties on electronic transmissions”, *WT/GC/W/859*. [5]
- WTO (2022), “Work Programme on Electronic Commerce: Ministerial Decision adopted on 17 June [54]
 2022”, *WT/MIN(22)/32 or WT/L/1143*.
- WTO (2021), “Work Programme on Electronic Commerce: Draft Ministerial Decision”, [4]
WT/GC/W/838/Rev.2.
- WTO (2018), “REcent Evolution of Developed-Economy MSME Participation in International Trade”, [38]
MSME Research note #1, *WTO*,
https://www.wto.org/english/tratop_e/msmes_e/ersd_research_note1_msme_in_developed_economies.pdf.
- WTO (2017), “Statement by Indonesia: 13 December 2017”, *WT/MIN(17)/68*. [52]
- WTO (2017), *Statement by Indonesia: Facilitator’s Consultation on Electronic Commerce, Mc11* [10]
declaration, and other relevant plenary sessions(*WT/MIN(17)/68*).
- WTO (2017), “Work Programme on Electronic Commerce: Ministerial decision of 13 December 2017”, [53]
WT/MIN(17)/65.
- WTO (2016), “Fiscal Implications of the Customs Moratorium on Electronic Transmissions: the Case of [16]
 Digitisable Goods”, WTO.
- WTO (2016), “Levelling the trading field for SMEs”, *World Trade Report 2016*, *World Trade* [39]
Organisation, https://www.wto.org/english/res_e/booksp_e/world_trade_report16_e.pdf.

- WTO (2014), “Imports of products that could be used as media to transport software: note by the Secretariat (G/VAL/W/249)”, https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S009-DP.aspx?language=E&CatalogueIdList=127543,127539,127534,127535,127551,127542,127514,127544,127552,127554,127553,127435,127430,127431,127432,127438,127436&CurrentCatalogueIdIndex=1&FullTextSearch=# (accessed on 20 June 2023). [49]
- WTO (2011), “Eighth dedicated discussion on Electronic Commerce under the auspices of the General Council on 20 and 28 October and 9 and 16 November 2011”, *WT/GC/W/644*. [48]
- WTO (2009), “Seventh dedicated discussion on Electronic Commerce under the auspices of the General Council on 8, 13, 22 and 27 October and 6 November 2009”, *WT/GC/W/614*. [47]
- WTO (2005), “Sixth dedicated discussion on Electronic Commerce under the auspices of the General Council on 7 and 21 November 2005”, *WT/GC/W/556*. [46]
- WTO (2003), “Fifth dedicated discussion on Electronic Commerce under the auspices of the General Council on 16 May and 11 July 2003”, *WT/GC/W/509*. [45]
- WTO (2003), “Fourth dedicated discussion on Electronic Commerce under the auspices of the General Council on 27 February 2003”, *WT/GC/W/492*. [44]
- WTO (2002), “Second dedicated discussion on Electronic Commerce under the auspices of the General Council on 6 May 2002”, *WT/GC/W/475*. [42]
- WTO (2002), “Third dedicated discussion on Electronic Commerce under the auspices of the General Council on 25 October 2002”, *WT/GC/W/492*. [43]
- WTO (2001), “Dedicated discussion on Electronic Commerce under the auspices of the General Council on 15 June 2001”, *WT/GC/W/436*. [41]

Annex A. NICDET provisions in RTAs

Dedicated discussions on E-commerce at the WTO

Starting in July 2001, WTO Members held eight “dedicated discussions” on E-commerce under the auspices of the General Council. These touched on a variety of topics including: the meaning of ‘electronic transmissions’, the fiscal implications of the Moratorium, technological neutrality, or the extent to which e-commerce, as defined by the WTO, may replace traditional forms of commerce (WTO, 2001^[41]; WTO, 2002^[42]; WTO, 2002^[43]; WTO, 2003^[44]; WTO, 2003^[45]; WTO, 2005^[46]; WTO, 2009^[47]; WTO, 2011^[48]).

These documents testify to a degree of diversity of views among Members as to how electronic transmissions might be defined. However, they also reflect a degree of common understanding across a number of areas. For instance, as summarised by the WTO Secretariat (WTO, 2001^[41]; WTO, 2002^[42]): “[a] majority of delegations agreed that a majority of electronically transmitted products were indeed services. However, there was still a lack of clarity with regard to the classification under GATT or GATS or certain products which can be delivered both in electronic form and on a physical carrier”.

From the early days of the decision, it was indeed clear that there were strong links between the term ‘electronic transmission’ and the concept of products that can be delivered both electronically and in physical format (e.g. cassettes and movies, tapes and music, diskettes and software). Indeed, according to (WTO, 2002^[43]) “[s]everal delegations had made useful contributions on classification, and there was a need to address the ‘grey’ areas, i.e. classification of electronically delivered products with a physical equivalent”.

A view that emerges from the texts is also that “a premature classification of the products in question could be a mistake” (WTO, 2002^[43]), as “[m]any delegations [...] felt that it was not desirable to try to seek a definitive determination of the classification of digital products in their entirety as either goods or services” (WTO, 2002^[42]).

These documents also highlight diverging views among Members, helping understand why the current use of the term ‘electronic transmissions’ remains ambiguous. A good example arises from the Fifth Dedicated Discussion on E-commerce (WTO, 2003^[45]). While some delegations called for a classification of electronic transmissions as services, by virtue for instance of their intangibility, other highlighted that items like e-books, software, or movies shared the features of goods, as they could be separated from the producer and could be stored (WTO, 2003^[45]). One delegation raised that “[w]hile classifying all electronic transmissions as services might be a quick and easy way to provide legal certainty, the stakeholders following the present discussion did not think the easiest way was the appropriate way” (WTO, 2003^[45]).

While these extracts do not provide definitive answers as to the exact meaning of the Moratorium, they tend to refer to electronic transmissions as the “grey areas” (WTO, 2002^[43]) of items that could potentially be traded in both physical (e.g. a CD, book) as well as in digital formats (e.g. a movie, an e-book). These items are perceived as challenging the distinction between goods and services, creating what is commonly understood as the ‘classification issue’ (WTO, 2001^[41]; WTO, 2002^[42]); etc..

These discussions seem to suggest that electronic transmissions might relate to a subset of goods that might be digitisable, or some sub-categories of digitally deliverable trade, but perhaps not e-mail exchange or data traffic.

Table A.1. Codebook for NICDET provisions in Regional Trade Agreements

Equals one if the condition in the description is met, zero otherwise

Variable	Description
content	The NICDET provision clarifies that the 'content' of electronic transmissions is covered
tax	The NICDET provision clarifies that internal taxes are not covered by the commitment, if applied in a manner consistent with the agreement.
fees	The NICDET provision prohibits the imposition of customs duties, plus 'fees or other charges' on electronic transmissions
prefe	The NICDET provision clarifies the preferential nature of the commitment, for instance 'between parties' to the agreement
ecom	The NICDET provision refers to the multilateral practice established in the WTO E-commerce work programme
temp	The NICDET provision is tied to the outcome of the WTO E-commerce Work Programme
dig_prod	The NICDET provision refers to 'digital products', typically accompanied by definitions in the E-commerce/Digital trade chapter (e.g., computer programs, text, video, images, sound recordings and other products that are digitally encoded)
nddp	The agreement includes a provision on the non-discriminatory treatment of digital products, typically with accompanying definitions of digital products (see dig_prod)
cust_val	The agreement includes a commitment to charge tariffs based on the value of carrier media rather than on the 'content' of carrier media transactions
excl_serv	The agreement clarifies, typically in a separate article or in the 'scope and general provisions' article of the chapter, that measures affecting the supply of services using electronic means fall within the obligations contained in relevant provisions of other chapters in the agreement, typically trade in services, financial services or investment chapters, as well as their exceptions.
et_serv	The agreement clarifies that deliveries by electronic means shall be considered as the provision of services

Source: Own calculations based on TAPED.

Annex B. Separating the carrier and content elements of physical transactions involving digital storage devices; list of digitisable goods

As highlighted in the body of the report, assessing the potential incidence of the WTO customs valuation 4.1 and of customs valuation commitments in Regional Trade Agreements requires to make a distinction between the value of ‘content’ that is carried on a media storage device as opposed to the value of the carrier media itself (i.e., the value of the plastic component of magnetic or optical media).

For the customs valuation 4.1, this also requires estimating, for magnetic and optical media, the share of ‘content’ that may be classified as software as opposed to other content, such as audio-visual or information content. The harmonised system classification, which is common among countries up to the 6 digit level of detail, makes a distinction between unrecorded and recorded media for the category of CDs. In order to estimate the potential value of content carried on optical media, the unit value of traded unrecorded media (852342) is compared to the value of traded recorded media (852349). When CDs carry information, they are generally traded at a much higher unit value than unrecorded CDs. For the category of recorded CDs, this means that the carrier component can generally be expected to represent around 20% of the value of trade in this product category in 2021.

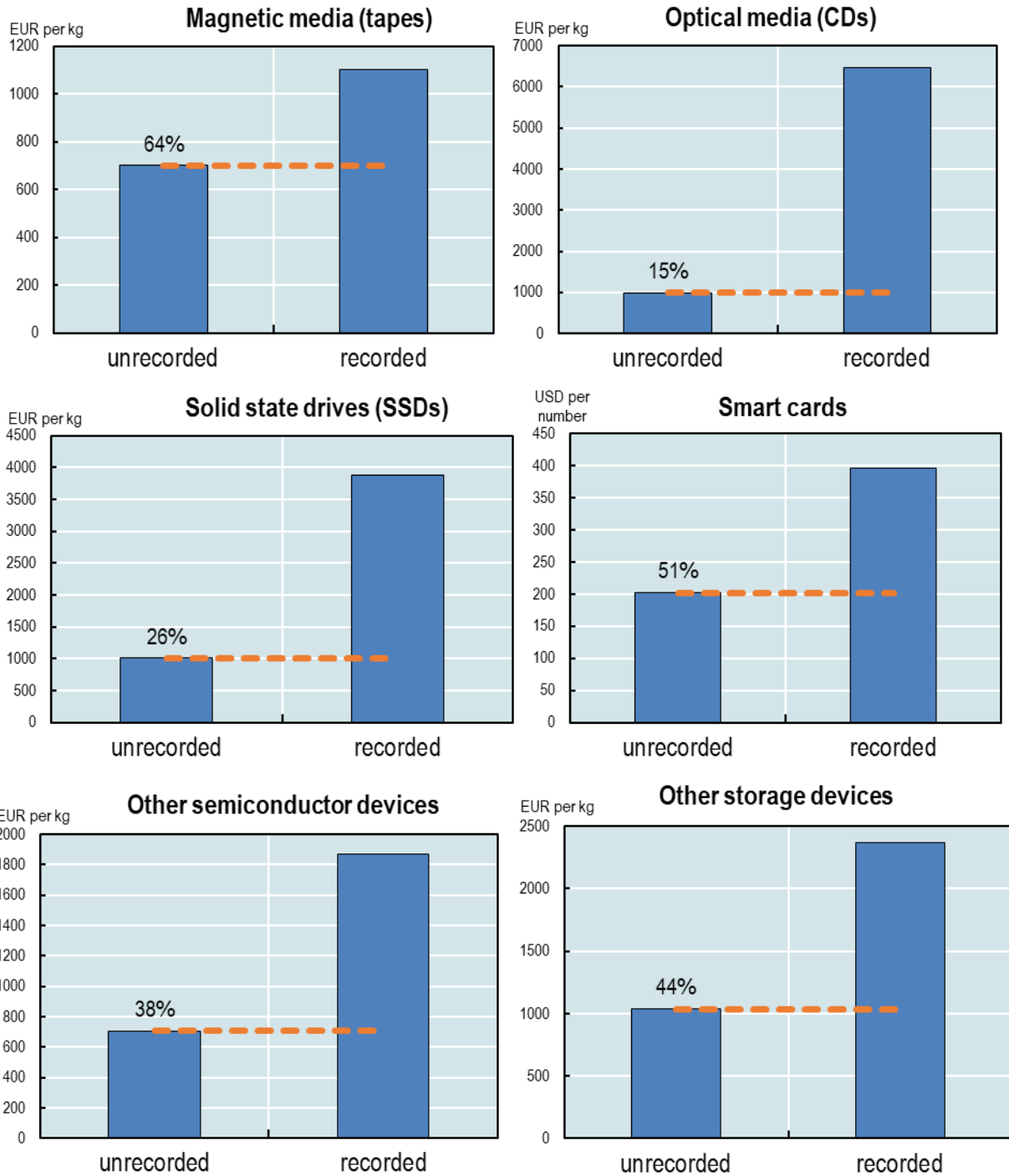
Beyond the category of optical media, however, the harmonised system does not differentiate storage devices such as video tapes or SSD cards based on whether they carry ‘content’ or not. In order to distinguish the carrier and content elements of these goods, this report uses more granular national classifications for digital storage devices. It finds that the United States classifies ‘smart cards’ depending on whether they carry content, and that the EU includes this separation for all other goods in chapter 8523, conventionally associated with trade in storage media (see WTO (2014_[49])).

These national classifications are used to compute the average carrier to content ratio for the 6-digit codes that appear in chapter 8523. This is computed as the simple average of the unit value of all product-export and product-import combinations for the USA in the category of smart cards and the EU27 for other carrier medium goods. The results of this estimation are presented below (Figure B.1).

Optical media tends to show the lowest carrier to content ratio. Magnetic media the highest. This may be due to the more limited storage capacity of magnetic media, able to carry less data, less widely used today (obsolete). For semiconductor media, the cost of the support may explain the somewhat higher shares of carrier to content estimates. This also shows that data from the European Union offers a close estimate to BACI for the year 2021: 15% against 20% for the value of carrier media vs. content on optical supports. The difference is in large part driven by content component being generally less expensive in other trade flows, while the estimate for the plastic component is relatively similar.

Figure B.1. Using a unit value approach to disentangle the value of carrier and content elements in digital storage devices

Estimates for 2021, for both export and import flows



Note: The products refer to HS digit codes 852329 (magnetic media), 852341 and 852349 (optical media), 852351 (SSDs), 852352 (smart cards), 852359 (other semiconductor devices), 852380 (other storage devices). The indicator unit value EUR reflects euros as well as other national currencies in the EU.

Source: Based on USITC and EUROSTAT COMEXT data – 10-digit and 8-digit trade flows respectively.

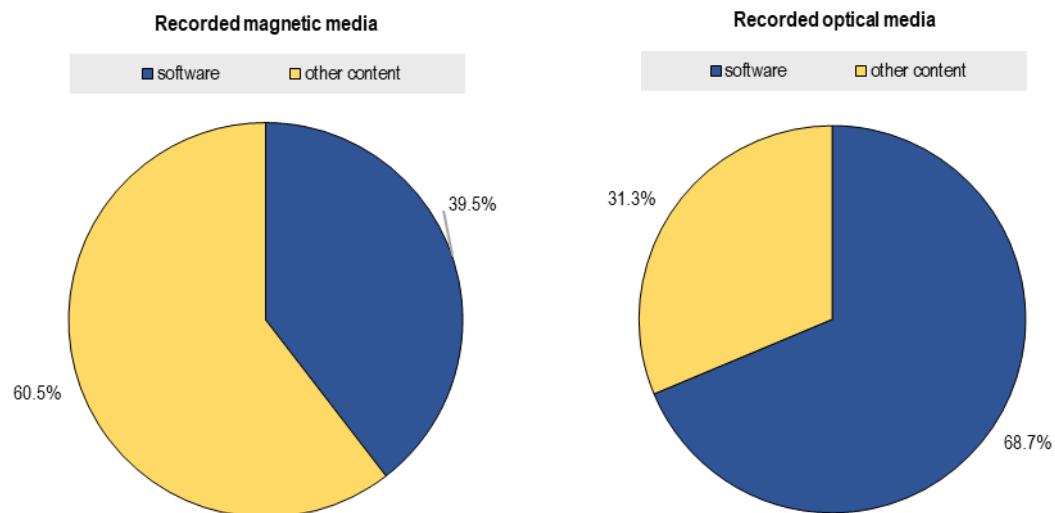
While customs valuation commitments among countries generally exempt the content of physical transactions from the imposition of tariffs regardless of what this consists of (e.g. movies, software, music), the WTO customs valuation decision 4.1 only applies to carrier medium bearing software in the category of magnetic and optical media. Efforts to expand the coverage of this decision to semiconductor media have been underway since 2014 – but have not yet produced a change of approach in multilateral rules.

This means that it is necessary to know what is the share of software that is carried as content on magnetic and optical media for a more accurate estimation of the potential incidence of this decision on tariff revenue. The customs nomenclatures of the United States and Canada distinguish international trade in recorded media based on the content they carry, e.g., whether video tapes, software and instructions, musical records, etc. These national nomenclatures are used to estimate the value that carrier media bearing software occupy in total recorded carrier media imports – for magnetic and optical media only as these are the goods that fall under the coverage of customs valuation 4.1.

Estimates are computed on a country-level basis and summarised for the world on average in Figure B.2. Magnetic media carrying software usually accounts for 39% of recorded magnetic media that is imported from the United States, while around 71% of imported carried media from Canada and the United States carries software.

Figure B.2. The share of software on recorded magnetic and optical media imports

Estimates from Canadian and American national customs nomenclature, 2021



Note: For magnetic media, other content includes sound cassettes, video tapes, and other content, while software includes content 'other than sound & image' (Schedule B number 8523.29.20.00). For optical media from the United States, other content includes sound content and other content, while software includes optical media carrying pre-packaged software (Schedule B number 8523.49.2010) and application software (Schedule B number 8523.49.4000). For Canada, software includes Pre-packaged software, customized software, and other software (Customs tariff numbers 8523.49.00.11, 8523.49.00.12 and 8523.49.00.18 respectively), while other content includes other recorded optical media and optical media carrying sound or image. The estimate for recorded optical media is a simple average across trade flows for exports from these two countries to the rest of the world. Source: USITC and Statistics Canada 10-digit trade flows.

Table B.1. List of digitisable goods across changes to the Harmonised System, with correlated items

The left column indicates the group of products while the other codes indicate HS 6-digit codes. Correlated items are at the bottom of the table

HS version:	1988/1992	1996	2002	2007	2012	2017
photographic material	370510	370510	370510	370510	370510	
photographic material	370590	370520	370520			
photographic material	370520	370590	370590	370590	370590	
photographic material	370610	370610	370610	370610	370610	370610
photographic material	370690	370690	370690	370690	370690	370690
printed matter	482110	482110	482110	482110	482110	482110
printed matter	490110	490110	490110	490110	490110	490110
printed matter	490191	490191	490191	490191	490191	490191
printed matter	490199	490199	490199	490199	490199	490199
printed matter	490210	490210	490210	490210	490210	490210
printed matter	490290	490290	490290	490290	490290	490290
printed matter	490300	490300	490300	490300	490300	490300
printed matter	490400	490400	490400	490400	490400	490400
printed matter	490510	490510	490510	490510	490510	490510
printed matter	490591	490591	490591	490591	490591	490591
printed matter	490599	490599	490599	490599	490599	490599
printed matter	490600	490600	490600	490600	490600	490600
printed matter	490700	490700	490700	490700	490700	490700
printed matter	490810	490810	490810	490810	490810	490810
printed matter	490890	490890	490890	490890	490890	490890
printed matter	490900	490900	490900	490900	490900	490900
printed matter	491000	491000	491000	491000	491000	491000
printed matter	491110	491110	491110	491110	491110	491110
printed matter	491191	491191	491191	491191	491191	491191
printed matter	491199	491199	491199	491199	491199	491199
storage devices					852349	852349
storage devices				852380	852380	852380
storage devices	852410	852410	852410			

HS version:	1988/1992	1996	2002	2007	2012	2017
storage devices	852421					
storage devices	852422					
storage devices		852432	852432			
storage devices		852439	852439			
storage devices		852451	852451			
storage devices		852452	852452			
storage devices		852453	852453			
storage devices		852460	852460			
storage devices		852499	852499			
storage devices				852351	852351	852351
storage devices				852352	852352	852352
storage devices				852359	852359	852359
storage devices		852431	852431			
storage devices		852440	852440			
storage devices		852491	852491			
storage devices		854212				
video games	950410	950410	950410	950410		
video games	950430	950430	950430	950430	950430	950430
video games	950440	950440	950440	950440	950440	950440
video games					950450	950450
video games					950490	950490
Correlated digitisable goods (based on UN correlation tables)						
photographic material						370500
storage devices	852390	852390	852390			
storage devices				852321	852321	852321
storage devices				852329	852329	852329
storage devices				852340		
storage devices	852423					
storage devices	852490					
Total	34	41	40	34	35	34

Source: Own calculations, based on WTO (2016) and Banga (2019).

Annex C. Fiscal implications of the Moratorium – commitments and practices

Table C.1. Existing commitments on digitisable goods and electronic transmissions

Commitments & practices	Scope	Inclusion in estimations
Preferential rates in regional trade agreements	Preferential rates negotiated in schedules of commitments apply to imports of digitisable goods where commitments have been made, only for imports from trade partners that are party to the agreement.	Preferential rates are included in estimations based on the TRAINS database.
NICDET provisions not tied to the WTO E-commerce Moratorium	NICDET provisions that are not tied to the WTO E-commerce Moratorium apply to all imports of digitisable goods - only with respect to exports from partners that are party to the agreement.	Bilateral pairs covered by 'non-temporary' commitments are included in the estimations
Current practice under WTO customs valuation decision 4.1	For countries that notified this approach on customs valuation to the WTO, magnetic media (tapes) and optical media (CDs) carrying software attract tariffs only on the basis of the value of their carrier component, and not their content. This practice applies for imports from all WTO Members.	See Annex B for customs valuation estimates
Customs valuation commitments in regional trade agreements	Customs valuation commitments in RTAs have a broader scope - they apply regardless of the type of carrier media (magnetic, optical or semiconductor) and of content (software or other content) - but are only included with respect to exports from the trade partners that are party to the agreement.	See Annex B for customs valuation estimates
Information Technology agreement and its expansion	Building on existing work (OECD, 2022 ^[50]), this report identifies five products as potentially covered by the ITA. Four of the products are included with ex-outs and one with no ex-out. Digital storage devices are included in the ITA expansion without ex-outs.	Only commitments under the ITA expansion agreement are included in the estimations.
'Free lines' in tariff schedules	Several countries exempt imports of digitisable goods from tariffs when they are classified under national 'free lines' (e.g. school books within the broader category of books). While it is possible to assess the incidence of 'Free lines' by product type, conventional tariff databases (i.e., TRAINS and WTOIDB) do not allow a comparable analysis of the value of imports under dutiable vs. free lines at lower levels of aggregation than the HS6 level. The value of imports under free lines is hence not included in current estimates.	Not included
GATS and services commitments in Regional Trade Agreements	GATS and services commitments in RTAs also impose market access and national treatment obligations that would apply to electronic deliveries. The incidence of these commitments was not quantified as a degree of judgement is required to assess which commitments would be relevant for electronic transmission, and because the lack of granularity in services trade statistics does not allow to differentiate the value of trade that would be covered by different commitments. These challenges also apply for services commitments undertaken in RTAs, where data availability issues also impose further barriers to use.	Not included

Source: Own calculations.

Table C.2. Number of GATS sub-sectors where commitments exist in computer, audio-visual and information services, by country

Country	Comp	Info	Audio	Country (continued)	Comp	Info	Audio
Afghanistan	5/5	1/1	1/6	Liechtenstein	5/5	1/1	0/6
Albania	5/5	1/1	0/6	Macao, China	0/5	0/1	0/6
Angola	0/5	0/1	0/6	Madagascar	0/5	0/1	0/6
Antigua and Barbuda	3/5	1/1	0/6	Malawi	0/5	0/1	0/6
Argentina	5/5	1/1	0/6	Malaysia	3/5	1/1	2/6
Armenia	5/5	1/1	4/6	Maldives	4/5	0/1	0/6
Australia	4/5	1/1	0/6	Mali	0/5	0/1	0/6
Bahrain, Kingdom of	0/5	0/1	0/6	Mauritania	0/5	0/1	0/6
Bangladesh	0/5	0/1	0/6	Mauritius	0/5	0/1	0/6
Barbados	1/5	1/1	0/6	Mexico	1/5	1/1	2/6
Belize	0/5	1/1	0/6	Moldova, Republic of	5/5	1/1	0/6
Benin	0/5	0/1	0/6	Mongolia	0/5	1/1	0/6
Bolivia, Plurinational State of	0/5	0/1	0/6	Montenegro	5/5	1/1	0/6
Botswana	5/5	0/1	0/6	Morocco	1/5	1/1	0/6
Brazil	0/5	0/1	0/6	Mozambique	0/5	0/1	0/6
Brunei Darussalam	5/5	1/1	0/6	Myanmar	0/5	0/1	0/6
Bulgaria	5/5	1/1	0/6	Namibia	0/5	0/1	0/6
Burkina Faso	0/5	0/1	0/6	Nepal	5/5	0/1	0/6
Burundi	0/5	0/1	0/6	New Zealand	4/5	1/1	5/6
Cabo Verde	5/5	1/1	3/6	Nicaragua	4/5	1/1	2/6
Cambodia	5/5	1/1	2/6	Niger	0/5	0/1	0/6
Cameroon	0/5	0/1	0/6	Nigeria	0/5	1/1	0/6
Canada	5/5	1/1	0/6	North Macedonia	5/5	1/1	0/6
Central African Republic	0/5	0/1	6/6	Norway	5/5	1/1	0/6
Chad	0/5	0/1	0/6	Oman	5/5	1/1	2/6
Chile	0/5	1/1	0/6	Pakistan	4/5	1/1	0/6
China	4/5	1/1	3/6	Panama	5/5	1/1	4/6
Colombia	4/5	1/1	0/6	Papua New Guinea	1/5	0/1	0/6
Congo	0/5	0/1	0/6	Paraguay	0/5	0/1	0/6
Costa Rica	4/5	0/1	0/6	Peru	0/5	1/1	0/6
Cte d'Ivoire	0/5	0/1	0/6	Philippines	0/5	1/1	0/6
Croatia	5/5	1/1	0/6	Qatar	4/5	0/1	0/6
Cuba	1/5	0/1	0/6	Romania	5/5	1/1	0/6
Democratic Republic of the Congo	0/5	0/1	0/6	Russian Federation	5/5	1/1	3/6
Djibouti	0/5	0/1	0/6	Rwanda	0/5	0/1	0/6
Dominica	0/5	1/1	0/6	Saint Kitts and Nevis	0/5	0/1	0/6
Dominican Republic	5/5	0/1	2/6	Saint Lucia	0/5	0/1	0/6
European Union 25	5/5	1/1	0/6	Saint Vincent and the Grenadines	0/5	0/1	0/6
Ecuador	4/5	1/1	0/6	Samoa	5/5	1/1	4/6
Egypt	0/5	1/1	0/6	Saudi Arabia, Kingdom of	5/5	1/1	2/6
El Salvador	1/5	0/1	2/6	Senegal	0/5	0/1	0/6
Eswatini	1/5	0/1	0/6	Seychelles	5/5	1/1	2/6
Fiji	0/5	0/1	0/6	Sierra Leone	5/5	0/1	0/6
Gabon	0/5	0/1	0/6	Singapore	3/5	1/1	2/6
The Gambia	5/5	1/1	4/6	Solomon Islands	0/5	0/1	0/6
Georgia	5/5	1/1	4/6	South Africa	5/5	1/1	0/6
Ghana	0/5	0/1	0/6	Sri Lanka	0/5	0/1	0/6

Grenada	0/5	1/1	0/6	Suriname	0/5	0/1	0/6
Guatemala	3/5	0/1	0/6	Switzerland	5/5	1/1	0/6
Guinea	0/5	0/1	0/6	Chinese Taipei	5/5	1/1	4/6
Guinea-Bissau	0/5	0/1	0/6	Tajikistan	5/5	1/1	3/6
Guyana	0/5	1/1	0/6	Tanzania	0/5	0/1	0/6
Haiti	0/5	0/1	0/6	Thailand	4/5	1/1	2/6
Honduras	2/5	0/1	0/6	Togo	0/5	0/1	0/6
Hong Kong, China	4/5	1/1	3/6	Tonga	5/5	1/1	4/6
Iceland	5/5	1/1	0/6	Trinidad and Tobago	2/5	1/1	0/6
India	5/5	1/1	1/6	Tunisia	0/5	0/1	0/6
Indonesia	2/5	0/1	0/6	Türkiye	3/5	1/1	0/6
Israel	4/5	1/1	1/6	Uganda	0/5	0/1	0/6
Jamaica	3/5	1/1	0/6	Ukraine	5/5	1/1	0/6
Japan	5/5	1/1	3/6	United Arab Emirates	4/5	0/1	0/6
Jordan	5/5	1/1	3/6	United States of America	5/5	1/1	6/6
Kazakhstan	5/5	1/1	3/6	Uruguay	5/5	0/1	0/6
Kenya	0/5	1/1	2/6	Vanuatu	5/5	1/1	1/6
Korea, Republic of	5/5	1/1	2/6	Venezuela, Bolivarian Republic of	5/5	0/1	0/6
Kuwait, the State of	4/5	0/1	0/6	Viet Nam	5/5	1/1	3/6
Kyrgyz Republic	5/5	1/1	5/6	Yemen	5/5	1/1	2/6
Lao People's Democratic Republic	5/5	1/1	0/6	Zambia	0/5	0/1	0/6
Lesotho	5/5	1/1	4/6	Zimbabwe	0/5	1/1	0/6
Liberia	5/5	1/1	2/6				

Note: Computer services refer to GATS subsectors 1.B.a, 1.B.b, 1.B.c, 1.B.d, 1.B.e. Information services refers to GATS subsector 2.C.j. Audiovisual services refers to GATS subsector 2.D.a, 2.D.b, 2.D.c, 2.D.d, 2.D.e, 2.D.f.

Source: WTO-World Bank I-TIP database.

Annex D. Benefits of the Moratorium

Impact of uncertainty on digitalisable goods and digital services

The impact of trade policy uncertainty on digitisable goods and digital services is estimated following the methodology set out in (Osnago, Piermartini and Rocha, 2015^[34]). Digitisable goods are identified based on the list of products in (Banga, 2019^[22]; WTO, 2016^[16]) updated as per Annex B. Gravity variables are from the CEPII database and trade and tariff data is from the TRAINS database. This implies that the database is compositional meaning that tariff data is only observed when there is positive trade.

Trade between country i and j in digital good product k at time t is a function of gravity explanatory variables X_{ijkt} as well as the Water in the tariff, calculated as the difference between the bound and the applied rate ($Water_{ijkt}$), the existing applied tariff ($Tariff_{ijkt}$) and whether or not there is an RTA (RTA_{ijt}):⁵⁸

$$m_{ijkt} = \alpha + \beta_1 X_{ijkt} + \beta_2 Water_{ijkt} + \beta_3 Tariff_{ijkt} + \beta_4 RTA_{ijt} + \delta_{ij} + \vartheta_{ij} + \mu_{jt} + \sigma_k + \varepsilon_{ijkt}$$

The model is estimated using different combinations of fixed effects to control for unobserved heterogeneity. Preference is given to the model that uses bilateral, as well as country-year and product fixed effects. The analysis is first undertaken for digital goods using the COMTRADE database (Table A.6a) but then also for aggregate measures of digital goods and digital services using the ITPDE database (Table A.6b).

⁵⁸ Where there is an existing RTA, the water in the tariff is the effectively applied, preferential, tariff. Mostly, this is zero, but where this is not, it reflects uncertainties about preferences granted, including the ability to meet requirements to meet these.

Table D.1. The impact of trade policy uncertainty on digitisable goods and digital services

	(a) COMTRADE 6 digit				(b) Aggregate	
	All	High-income	Middle-income	Low-income	digital services	digitisable goods
Water	-0.00104*** (-4.06)	0.000354 (0.95)	-0.00168*** (-3.50)	-0.00202*** (-3.80)	-0.00187 (-1.51)	-0.00684*** (-8.17)
RTA	0.0523*** (4.06)	0.0455*** (2.61)	0.0887*** (3.75)	0.0598 (1.61)	-0.0342 (-1.22)	0.0696*** (2.7)
MFN rate	-0.0159*** (-33.13)	-0.00924*** (-9.52)	-0.0148*** (-17.23)	-0.0160*** (-17.59)	0.00147 (0.61)	-0.0228*** (-14.72)
Constant	1.858*** (270.25)	2.283*** (307.98)	1.559*** (105.4)	1.369*** (63.2)	-2.387*** (-112.87)	3.749*** (196.69)
Sector	YES	YES	YES	YES	YES	YES
rep-part	YES	YES	YES	YES	YES	YES
reporter-year	YES	YES	YES	YES	YES	YES
partner-year	YES	YES	YES	YES	YES	YES
N	1148464	1151196	1148682	1148464	126995	150510
R-sq	0.527	0.426	0.509	0.527	0.867	0.865

Source: Own calculations using TRAINS and ITPDE data.

Impact of tariffs on services

The impact of tariffs on services exports by income group is calculated as the value of exports of digital services from country i to country j , x_{ij} , multiplied by the coefficient obtained from Table A.6a ($\beta_{inc_group}^{water}$ and $\beta_{inc_group}^{water}$) and either the water in the tariff faced by country i in country j ($Water_d_{ij}$) or the applied tariff ($AHSrate_{d_{ij}}$). To get the country value of trade that would be affected by tariffs and uncertainty the sum across all destinations is taken. We then sum countries losses across income levels..

$$totalxwater_i = - \sum_j x_{ij} * (\beta_{inc_group}^{water} * Water_d_{ij})$$

$$totalxtariff_i = - \sum_j x_{ij} * (\beta_{inc_group}^{tariff} * AHSrate_{d_{ij}})$$

For imports a similar technique is used. Here, the value of imports, m_{ij} , is multiplied by the coefficient for the water and the tariff and this is then multiplied by the water or the tariff faced by importers.

$$totalxwater_i = \sum_j m_{ij} * (\beta_{inc_group}^{water} * Water_{ij})$$

$$totalxtariff_i = \sum_j mij * (\beta_{incgroup}^{tariff} * AHSrate_{ij})$$

To ensure a wider coverage of countries at different income levels, the ITPDE database is used. Digital services are identified as sectors D58T60 – Publishing, audiovisual and broadcasting activities and D61 – Telecommunications.

Impact of digital inputs on domestic competitiveness

The empirical strategy follows (Andrenelli and López González, 2019^[1]; Lopez-Gonzalez, 2016^[51]) which categorises the determinants of specialisation patterns into three broad categories: i) structural factors – such as factor endowments; ii) policy variables – including institutional setting and trade and investment variables; and iii) international linkages.

To control for structural determinants three measures are used: i) the ratio of capital to labour; ii) the per capita GDP of the country at constant prices; and iii) the share of the population which is connected to the internet. The policy variables capture; i) the institutional setting using the political stability index from the World Governance Indicators; and ii) investment openness (using the share of foreign FDI stocks in GDP from the WDI database).

The international linkages are identified using: i) digital services inputs, which is the foreign value added used to produce output at a sector level (a temporal lag is taken to avoid mechanical associations or reverse causality with the dependent variable); ii) digitisable good imports, identified as they have been throughout the paper; and iii) the degree of backward participation, which is the import content of exports, as a control variable for existing degree of GVC participation.

The dependent variable is the domestic value added, from a particular sector, used to produce aggregate output. These variables are calculated from first principles using the OECD TiVA database 2023 which is available for 77 countries during the period 1995-2020.

The estimated model takes the form below. It is estimated using standardised coefficients to facilitate comparison across different income categories. Reporter-sector and time Fixed effects are added so as to capture the impact of changes in international linkages on changes in domestic competitiveness by sector

$$\begin{aligned} DVA_{ikt} = & \alpha + \beta_1 \ln(ImpDigInputs)_{ikt} + \beta_2 \ln(DigitGoods)_{ikt} \\ & + \beta_3 Backward_{ikt} + \beta_4 \ln(KL)_{it} + \beta_4 \ln(GDPcap)_{it} \\ & + \beta_4 \ln(FDIshare)_{it} + \beta_4 \ln(PolStab)_{it} + \delta_{ik} + \vartheta_t \\ & + \varepsilon_{ikt} \end{aligned}$$

Table D.2. Impact of digital inputs on domestic competitiveness

	All	High-income	Middle-income	Low-income
Log of Foreign Digital Services Inputs(-1)	0.583*** (161.57)	0.596*** (123.78)	0.524*** (65.89)	0.558*** (73.21)
Log of Foreign Digitisable goods imports(-1)	0.0177*** (5.98)	0.0139*** (3.08)	0.0378*** (4.97)	0.0164*** (3.19)
Log of Backward participation	-0.189*** (-63.99)	-0.183*** (-35.34)	-0.191*** (-37.57)	-0.172*** (-39.09)
Log of Capital-labour ration	0.115*** (21.55)	0.0993*** (11.48)	0.111*** (11.38)	0.0528*** (4.24)
Log of Per Capita GDP	0.00195** (2.09)	0.00206 (1.31)	0.000907 (0.54)	0.00184 (1.17)
Log of FDI inflow share	-0.00705*** (-5.17)	-0.00944*** (-5.41)	-0.00239 (-0.63)	-0.00209 (-0.56)
Political Stability Index	0.00997*** (3.33)	0.0229*** (3.69)	-0.00809 (-1.44)	0.0350*** (7.35)
Log of share of pop connected to the Internet	0.0681*** (19.56)	0.0799*** (7.4)	-0.0234** (-2.52)	0.0159*** (2.66)
Constant	0.0262*** -20.23	-0.0928*** (-10.92)	0.174*** -27.66	0.0977*** -7.08
Reporter-sector FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
N	40507	22815	8624	9068
R-sq	0.98	0.978	0.985	0.981

Source: Own calculations based on TiVA database.

Table D.3. Impact of webpage or digital deliveries on propensity to export

	SME	Large	SME	Large
Age	0.000738 (1.32)	0.00240*** (3.42)	0.000391 (0.33)	0.000959 (0.84)
Employees	0.0102*** (16.37)	1.28E-05 (0.61)	0.0123*** (16.43)	0.000221* (2.5)
Share of foreign inputs	0.00523*** (11.72)	0.00722*** (9.72)	0.00273** (2.69)	0.00577*** (4.62)
Line of credit	0.148*** (8.23)	0.251*** (5.57)	0.229*** (4.36)	0.277** (3.06)
Managerial experience	0.00158 (1.87)	0.00314** (3.04)	0.181*** (3.5)	0.147 (1.42)
Webpage	0.407*** (15.82)	0.315*** (7.67)		
Digital deliveries			0.0113*** (6.54)	0.00534*** (5.37)
Foreign ownership	0.00639*** (14.41)	0.00682*** (14.63)	0.00249 (1.49)	0.00145 (0.59)
purchases of fixed assets	0.121*** (7.29)	0.169*** (4.82)	0.0877 (1.54)	0.111 (1.14)
Constant	-2.599*** (-18.06)	-1.477*** (-7.26)	-2.016*** (-22.18)	-0.361* (-2.48)
N	76421	20445	3062	1508
R-sq				

Note: Results show impact on propensity to export using a probit model.

Source: Own calculations based on World Bank Enterprise Survey.

Table D.4. Women owned SMEs benefit more from use of digital tools than male owned SMEs

	All	Fem owned	non-Female owned
Age	0.00240*** (4.9)	0.00386*** (5.46)	0.00120* (2.14)
Employees	1.72E-05 (0.69)	-3.1E-06 (-0.34)	0.000327*** (4.55)
SME	-0.651*** (-16.77)	-0.658*** (-16.76)	-0.559*** (-11.65)
Share of foreign inputs	0.00581*** (12.69)	0.00503*** (11.39)	0.00619*** (11.55)
Line of credit	0.212*** (9.82)	0.152*** (6.65)	0.233*** (9.66)
Managerial experience	0.466*** (16.98)	0.441*** (13.98)	0.463*** (15.64)
Webpage	0.00724*** (18.47)	0.00751*** (10.88)	0.00709*** (19.56)
Foreign ownership	0.00180* (2.31)	0.00191 (1.85)	0.00177* (2.23)
purchases of fixed assets	0.170*** (9.62)	0.184*** (6.25)	0.150*** (8.09)
Constant	-1.651*** (-12.53)	-1.246*** (-6.99)	-1.745*** (-12.90)
-----	-----	-----	-----
N	96904	29636	67131
R-sq			

Note: Results show impact on propensity to export using a probit model. Female owned firms are identified as those where female ownership is above 50%.

Source: Own calculations based on World Bank Enterprise Survey.

Table D.5. Impact of having a webpage on overall and female employment

	Overall employment		Female employment	
	SME	Large	SME	Large
age	0.00638*** (29.01)	0.00545*** (18.5)	0.00519*** (10.91)	0.00423*** (3.83)
Share of foreign inputs	0.00104*** (11.14)	0.00137*** (7.61)	-6.6E-05 (-0.31)	0.00175* (2.51)
Line of credit	0.211*** (31.03)	0.0725*** (6.05)	0.134*** (8.36)	0.161*** (3.48)
Managerial experience	0.000471 (1.63)	0.000567 (1.13)	0.00126 (1.79)	-0.00065 (-0.34)
Webpage	0.397*** (59.81)	0.227*** (18.44)	0.269*** (16.74)	0.194*** (3.56)
Foreign ownership	0.00433*** (28.12)	0.00307*** (16.35)	0.00338*** (9.09)	0.00301*** (4.03)
purchases of fixed assets	0.216*** (26.38)	0.128*** (10.23)	0.146*** (9.16)	0.0729 (1.52)
Constant	2.319*** (304.69)	4.956*** (296.4)	1.040*** (54.14)	3.143*** (45.89)
-----	-----	-----	-----	-----
N	76002	20400	18175	3130
R-sq	0.199	0.131	0.147	0.346

Note: Results show impact on volume of employment using cross-sectional data with country, sector and year controls.

Source: Own calculations based on World Bank Enterprise Survey.

Table D.6. Impact of having a webpage on productivity

	Overall productivity		Productivity in female owned firms	
	SME	Large	SME	Large
age	0.00163*** (5.39)	0.00274*** (5.58)	0.00296*** (6.05)	0.00248*** (3.79)
Share of foreign inputs	0.00280*** (16.86)	0.00287*** (8.19)	0.00252*** (9.05)	0.00326*** (7.47)
Line of credit	0.217*** (19.19)	0.214*** (9.27)	0.237*** (12.7)	0.223*** (7.73)
Managerial experience	0.00219*** (4.72)	0.00273** (3.08)	0.00271*** (3.49)	0.00219 (1.93)
Webpage	0.364*** (31.46)	0.295*** (11.02)	0.291*** (14.28)	0.317*** (10.17)
Foreign ownership	0.00579*** (19.67)	0.00344*** (10.03)	0.00385*** (7.11)	0.00284*** (6.82)
purchases of fixed assets	0.113*** (10)	0.204*** (8.47)	0.172*** (9.56)	0.157*** (5.27)
Constant	16.18*** (1225.11)	16.44*** (461.97)	15.61*** (624.88)	16.57*** (397.86)
N	74856	20163	22549	13340
R-sq	0.928	0.924	0.941	0.919

Note: Results show impact on volume of employment using cross-sectional data with country, sector and year controls. Productivity calculated as sales, in dollar terms, by employee.

Source: Own calculations based on World Bank Enterprise Survey.