



1. Introduction

Why is it important to measure digital trade? This chapter outlines the multifaceted impact of digitalization on international trade and examines which policy areas require consistent, comprehensive and feasible measurement approaches.

1.1 Introduction

Digital technologies are transforming economic and societal processes. Major improvements in internet connectivity have enabled businesses and households to exchange and transfer information with greater variety, in increasing volume and at higher velocity. Computing power and data storage have surged as costs have declined, boosting the development of software tools as well as of advanced technologies and analytical techniques. Consequently, the number of new business models, products and modes of delivery that exploit digital technologies is rapidly increasing.

These developments reflect processes both of digitization and digitalization. Digitization is defined as “the conversion of analogue data and processes into a machine-readable format” (OECD, 2019a). Digitization can take many forms, such as the translation of analogue measurements into a digital format, the encoding of business and industrial processes, or the transmission of Voice over Internet Protocol (VoIP) (i.e., the conversion of voice into digital signals for transmission via the internet). Digitalization is a broader concept, understood as the use of digital technologies and data and the interconnections between them, which result in new activities or in changes to existing activities. Collectively, the changes produced by different forms of digitization and digitalization on economic and social activities constitute the *digital transformation*.

Digital technologies have profoundly impacted international trade. On the supply side, firms benefit from the use of digital technologies, as they can boost efficiency and productivity, transform business processes and foster innovation (Nguyen and Paczos, 2020; Gal et al., 2019; Sorbe et al., 2019). At the same time, digitalization has spurred the use of digital technologies on the demand side. In particular, the rise of online retail, wholesale and digital platforms has eased businesses’ access to markets, with consumers in turn benefitting from access to a broader selection of products and increased customization (Coreynen, Matthyssens and Van Bockhaven, 2017).

Arguably, the most transformative impact that digitalization has had on trade has been a rapid reduction in the costs of international transactions, which has made it affordable for firms to reach global markets. In much the same way that reductions in transport and coordination costs enabled the fragmentation of production along global value chains, falling costs of sharing information are powering this digital trade revolution. The lower costs of storing and sharing information are reducing some of the traditional constraints associated with engaging in international trade, such as asymmetric information, delays in delivery, or contract enforcement. This is encouraging a greater number of businesses and consumers to connect globally, as well as leading to a faster diffusion of knowledge and ideas across borders.

The rest of the chapter is organized as follows. Section 1.2 shows some indicators providing a view of the impact of digitalization on international trade. Section 1.3 presents the statistical definition of digital trade. Section 1.4 outlines the policy needs that call for better measurement of digital trade. Section 1.5 presents the purpose and the structure of this Handbook. Section 1.6 identifies areas where research is ongoing and may have an impact on the measurement of digital trade and the compilation guidance provided in the Handbook. Finally, Section 1.7 concludes.

1.2 The impact of digitalization on international trade is multifaceted

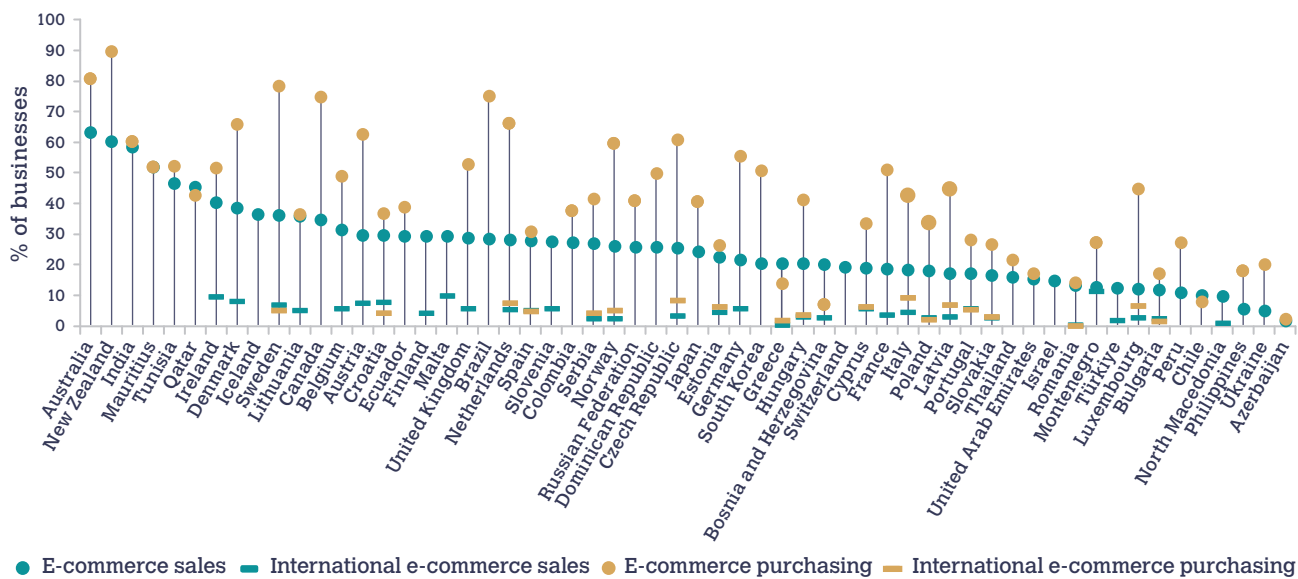
1.2.1 DIGITALIZATION HAS ENABLED THE EMERGENCE OF E-COMMERCE

Thanks to rapid technological advancements, businesses and households can now order goods and services online. The rise of e-commerce, both at domestic and international level, has spurred significant policy interest and motivated several measurement initiatives. Surveys of ICT usage have been used for a number of years as the main instrument to gather information on businesses’ participation in e-commerce and to provide insights on e-commerce trends and dynamics (see Figure 1.1). In 2021, the countries reporting the highest share of firms engaged in e-commerce purchasing were New Zealand (89.6 per cent), Australia (80.7 per cent), Sweden (78.4 per cent) and Brazil (75.0 per cent), followed by Canada (74.9 per cent) and the Netherlands (66.1 per cent). The share of firms engaging in e-commerce sales is generally lower, with the most active countries being Australia (63.3 per cent), New Zealand (60.3 per cent) and India (60.2 per cent). Widespread and comparable evidence on the split between domestic and international e-commerce, as well as on the value of e-commerce transactions, is, however, not available.

1.2.2 SERVICES ARE INCREASINGLY TRADED AT A DISTANCE

Many services that traditionally required proximity between producers and consumers can now be traded remotely, allowing firms more opportunities to reach global markets. Falling prices for voice and data communications, along with the computerization of tasks, allow service providers to segment and relocate work to take advantage of large, remote pools of lower-cost labour with the skills needed to deliver high quality services. At the same time, low-value services, such as smartphone applications

Figure 1.1: Businesses make extensive use of e-commerce



Note: The latest available figures are presented for each economy. Sales and purchases figures may refer to different years. International e-commerce sales figures relate to reporting year 2020. International e-commerce purchases relate to reporting year 2017.

Source: Eurostat Digital Economy and Society Statistics Comprehensive Database;¹ OECD ICT Access and Usage by Businesses database;² and UNCTAD core indicators on ICT use in business.³

or online banking services, are increasingly traded internationally, often via digital platforms (UNCTAD, 2022c).

In 2012, the United States Bureau of Economic Analysis (BEA) made a first attempt to measure trade in “digitally enabled” services, referring to services “for which digital information and communications technologies (ICT) play an important role in facilitating cross-border trade in services”. In the study, the BEA stated that “improvements in ICT technologies and reductions in their costs could be expected to contribute to growth in trade in services” (Borga and Koncz-Bruner, 2012).

In 2013, the Task Group on Measuring Trade in ICT Services and ICT-enabled Services (TGServ), led by the United Nations Conference on Trade and Development (UNCTAD), developed recommendations and indicators on ICT-enabled services trade.⁴ In its first report, the Task Force set out definitions for ICT services (defined in OECD (2011)), ICT-enabled services and potentially ICT-enabled services, which this Handbook builds on to define *digitally deliverable services* (UNCTAD, 2015).

Services trade as a whole and trade in digitally deliverable services have increased significantly over the past two decades (Figure 1.2). In 2012, digitally deliverable services represented 48 per cent of global exports of services. This share increased to 52 per cent in 2019 and jumped to 63 per cent in 2021, reflecting the impact of the COVID-19 pandemic on both the composition and the nature of internationally traded services.

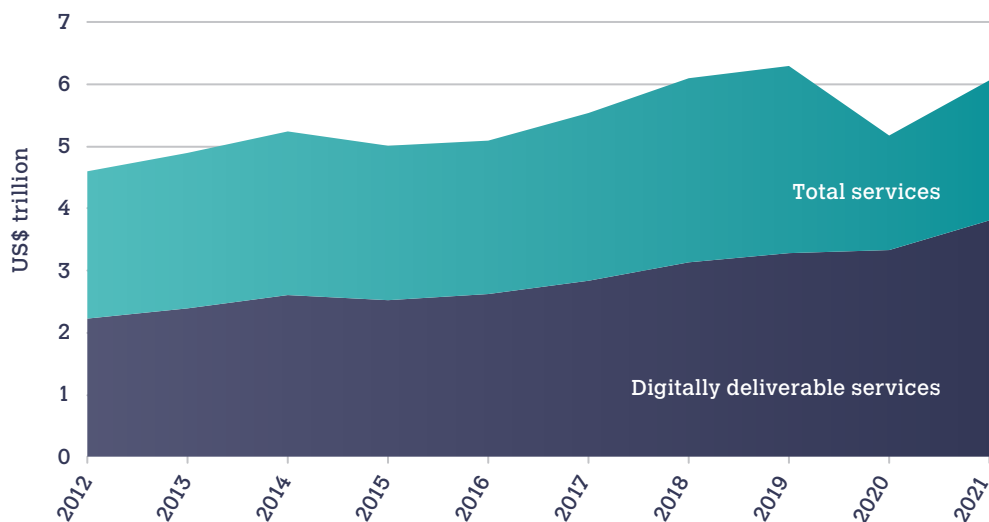
1.2.3 ONLINE PLATFORMS PLAY A TRANSFORMATIVE ROLE IN MANY INDUSTRIES

Online platforms are increasingly important “market makers”. They match supply with demand, facilitating and structuring online interactions and transactions (OECD, 2019b). They can develop and exploit large network externalities, with many online platforms offering their services on a global scale. Often considered as “catalysts” of digitalization, online platforms have transformed not only retail and wholesale trade marketplaces, but also industries such as accommodation, transport and food services, as well as many business-to-business (B2B) transactions. Just like digitally deliverable services, sales of goods and services through online platforms surged during the COVID-19 pandemic (Figure 1.3).

1.3 The statistical definition of digital trade

While relevant and informative, the stylized facts presented above only provide a partial view of what is a complex, multidimensional phenomenon. Measures of trade in digitally deliverable services shed some light on which products could be delivered digitally, yet do not fully capture the dimension of how these services were actually delivered. On the other hand, the core indicators on e-commerce target how products are purchased and sold but do not capture the monetary value of these transactions and often do not delineate domestic and international e-commerce (UNCTAD, 2023). Similarly, information on the activity of online

Figure 1.2: Global exports of digitally deliverable services have been growing steadily



Note: Digitally deliverable services are an aggregation of the BPM6/EBOPS 2010 service categories insurance and pension services, financial services, charges for the use of intellectual property n.i.e., telecommunications, computer and information services, other business services, and audiovisual and related services.

Source: UNCTAD calculations based on WTO and UNCTAD (2022).

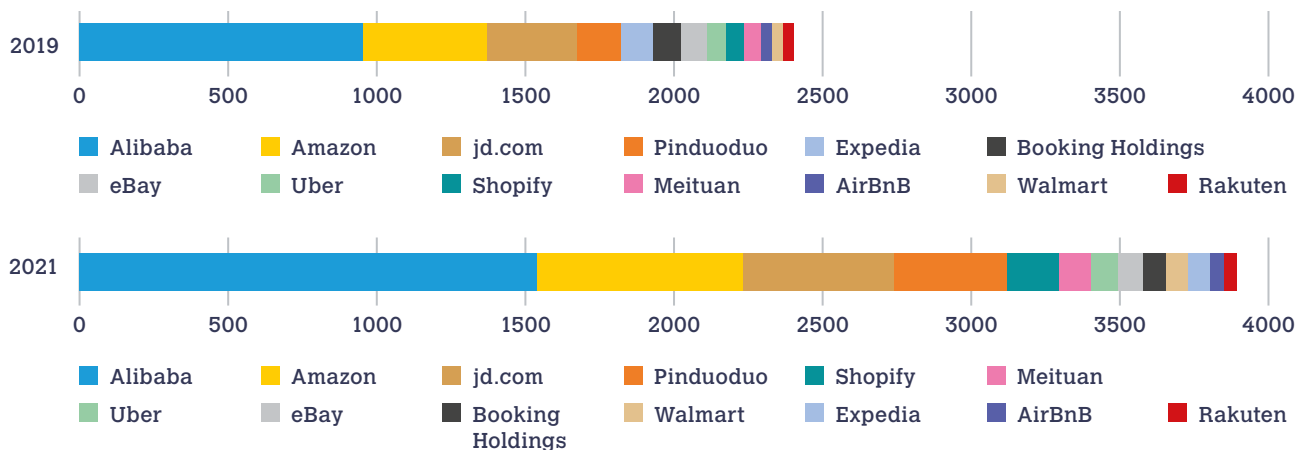
platforms is still piecemeal, focused on a specific subset of platforms, and not comparable across countries because of differences in definitions and compilation methods (OECD, 2018a).

Over the last twenty years, a number of initiatives have emerged to measure different aspects of digitalization. The most important measurement initiatives on which this Handbook draws are the OECD and UNCTAD work on defining and measuring e-commerce, UNCTAD’s work on ICT-enabled trade, and the OECD’s broader efforts on measurement in the context of the Going Digital Project.⁵ On the policy front, the WTO Work Programme on Electronic Commerce, established

in 1998, defines e-commerce as the “production, distribution, marketing, sale or delivery of goods and services by electronic means” (WTO, 1998a). More recently, the work of López-González and Jouanjean (2017) proposes a framework for digital trade useful for trade policy analysis, by which all digitally enabled transactions are considered to be in scope for digital trade.

Building on all of the above, the first edition of this Handbook (OECD, WTO and IMF, 2019) formalized for the first time a statistical definition of digital trade, combining the two key criteria of digital ordering and digital delivery: “digital trade is all international trade

Figure 1.3: Sales through online platforms are booming



Note: The chart covers digital intermediation platforms as defined in this Handbook (e.g., Uber), as well as e-tailers. In some cases, both business models may co-exist on the same platform (e.g., Amazon, Alibaba). The figures reflect the gross value of goods and services sold by/through these companies.

Source: UNCTAD (2022a), based on company reports.

that is digitally ordered and/or digitally delivered". This definition reflects the multi-dimensional character of the phenomenon by identifying the nature of the transaction as the defining characteristic of digital trade and acknowledges the overlap that may exist between digitally ordered and digitally delivered trade.

Digitally ordered trade, defined in this Handbook as *"the international sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders"*, echoes the OECD definition of e-commerce (OECD, 2011). Digitally delivered trade, which only covers services, is defined as *"all international trade transactions that are delivered remotely over computer networks"* and builds on the concept of ICT-enabled services transactions developed by TGServ (UNCTAD, 2015). This definition of digitally delivered trade is broader than that in the first version of this Handbook, as it covers any form of digital delivery, not only delivery methods *"specifically designed for the purpose of delivering services"* (see Chapter 2). The definition thereby becomes more straightforward to interpret and to implement in practice.

The alignment in concepts and terminology with previous initiatives provides clarity for users and ensures that compilers can leverage the measurement instruments already in place to produce estimates of digital trade. Importantly, the two statistical criteria of digital ordering and digital delivery are inherently encompassed by the WTO definition of e-commerce cited above. Figure 1.4 illustrates the relationships between e-commerce, digital trade and their components.

Following extensive consultations with compilers and policymakers,⁶ this definition of digital trade is now widely accepted and has proven feasible and practicable for statistical compilers. Several countries have started to implement the concepts and measurement approaches introduced by the previous edition of the Handbook (see, for example, the case studies in Chapter 6). Furthermore, the concepts of digital ordering and digital delivery have been fully integrated into, and are consistent with, the framework of digital supply and use tables (see Annex A and the OECD Handbook on Compiling Digital Supply and Use Tables (OECD, 2023)).

1.4 Measuring digital trade is key for effective policymaking

The goal of this Handbook is to help statistical compilers to address policymakers' demands for better statistical evidence on digital trade.

Starting with its Chinese presidency in 2016, the Group of 20 (G20) has been placing significant emphasis

on the measurement of the digital economy and, by extension, the measurement of digital trade. The 2017 G20 Digital Economy Ministerial Declaration, under the German Presidency, called for a review of the statistical frameworks to encompass and separately identify the digital economy (G20 Research Group and University of Toronto, 2017). The measurement dimension has remained high up on the agendas of the more recent G20 presidencies. Through the G20 Trade and Investment Working Group and the Digital Economy Task Force, the G20 has regularly emphasized the importance of measuring digital trade to enable policymakers to harness, regulate and shape digital trade flows.

International trade policy is arguably the policy area in which comprehensive and comparable evidence on digital trade is most crucial to assess existing market access in the context of a rapidly changing business environment, as well as to negotiate new digital economy agreements. However, digital trade affects and is affected at both the domestic and international levels by many other policy areas, including competition and tax policies, as well as development and economic growth. This section gives a brief overview of the policy needs that call for better measurement of digital trade.

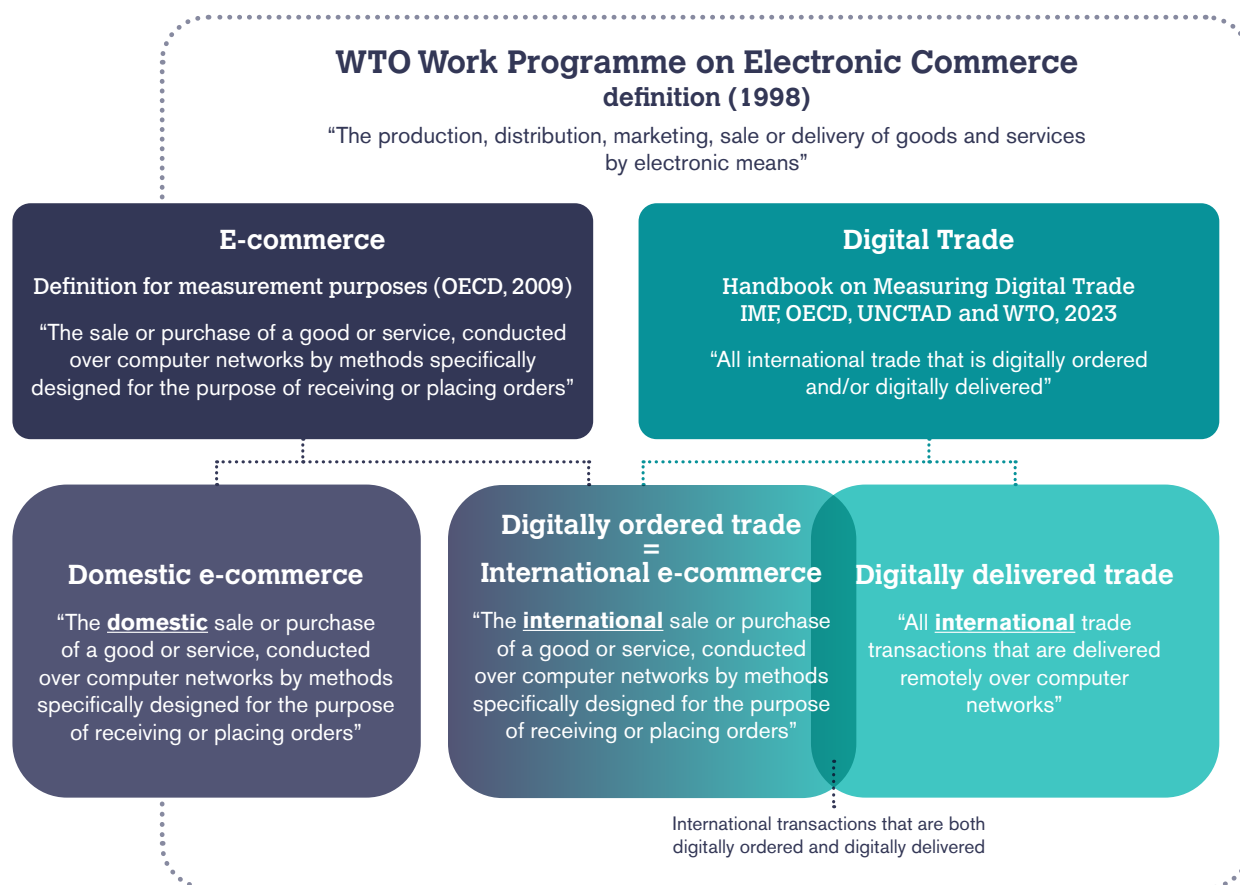
1.4.1 INTERNATIONAL TRADE POLICY

As digital trade continues to grow, so too do discussions on digital trade policies, in the context of the WTO Work Programme on Electronic Commerce, through the WTO Joint Initiative on E-commerce, in regional trade agreements (RTAs), as well as in digital economy agreements (DEAs).⁷ However, these discussions are taking place in the context of a relatively thin evidence base, which limits the understanding of the short and long-term benefits, the channels of transmission and the implications of digitalization and related policies. This underscores the importance of this Handbook in providing guidance to better capture the nature and evolution of digital trade and helping to examine its economic, social and environmental impact.

Multilateral agreements under the WTO cover important aspects of digital trade in goods and services. The General Agreement on Trade in Services (GATS), which entered into force in January 1995, remains of primary importance for digital trade. The General Agreement on Tariffs and Trade (GATT), which entered into force in October 1947, and the Trade Facilitation Agreement (TFA), which entered into force in February 2017, have supported digitally enabled trade in goods, while the Information Technology Agreement (ITA), which was concluded in December 1996, has been key in eliminating tariff barriers for certain ICT products.

Despite rapid and far-reaching technological change, the rules and commitments underpinning the digital trade environment at the multilateral level, although

Figure 1.4: Digital trade and e-commerce – fundamental concepts and statistical definitions



Note: The statistical definitions of e-commerce and digital trade are fully compatible with the WTO definition of the Work Programme on Electronic Commerce. In addition to cross-border e-commerce, the WTO Work Programme also covers the domestic e-commerce activities of foreign owned or foreign-controlled service suppliers. The definition of digital trade given in this Handbook is also compatible with the description of e-commerce in IMF (2009) (i.e., “e-commerce is a method of ordering or delivering products at least partly by electronic means, such as through the internet or other computer mediated networks”).

Source: IMF, OECD, UNCTAD and WTO.

technology-neutral, have remained unchanged. Multilateral discussions on digital trade began in 1998 with the launch of the WTO Work Programme on Electronic Commerce (WTO, 1998a). In the same year, WTO members agreed on a moratorium on customs duties on electronic transmissions, which states that “members will continue their current practice of not imposing customs duties on electronic transmission”. The moratorium has been regularly extended (most recently at the 12th Ministerial Conference in June 2022).⁸

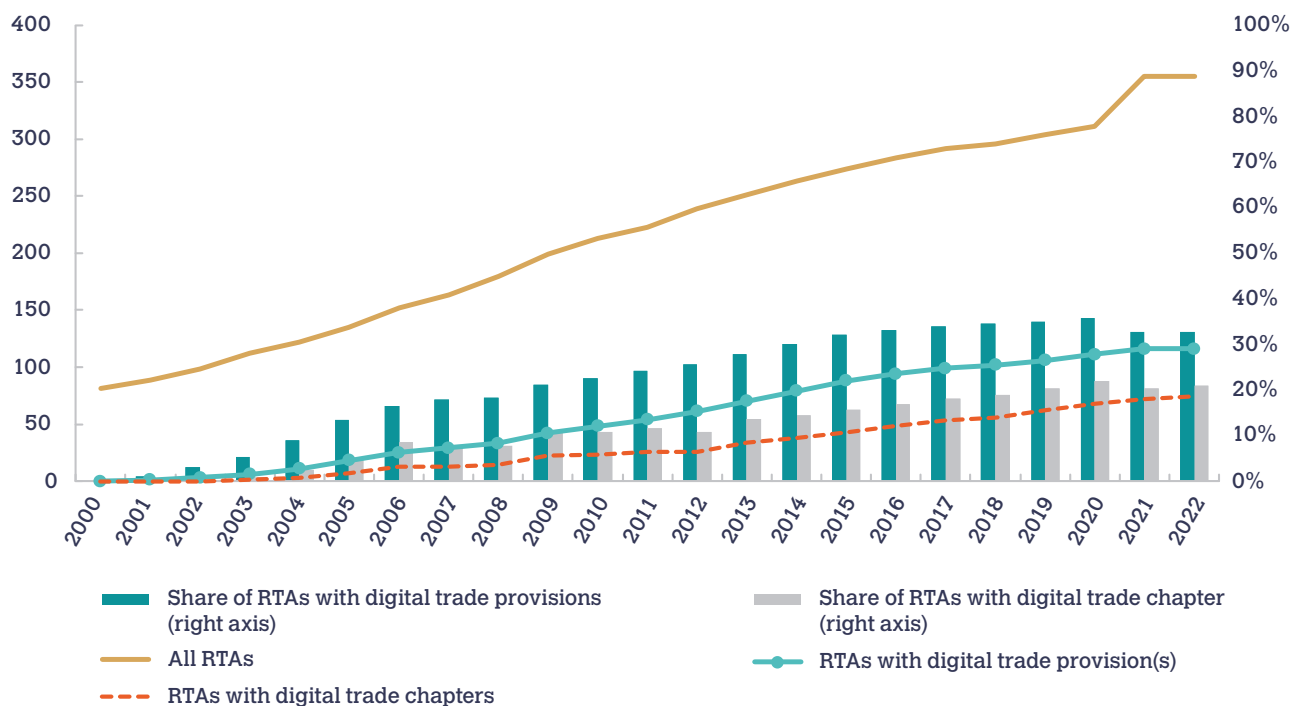
In January 2019, a group of WTO members confirmed their intention to commence negotiations on trade related aspects of e-commerce (WTO, 2019). As of July 2023, 89 members were participating in the Joint Initiative on Electronic Commerce and addressing a range of issues, including the development of disciplines on e-signatures and e-payments, as well as information flows, privacy, consumer protection and cybersecurity.⁹

Prior to the Joint Initiative on Electronic Commerce, the governance of issues related to digital trade was largely

negotiated in the context of bilateral and regional trade agreements. In 2022, there were 116 such agreements with digital trade provisions, representing 33 per cent of all agreements notified to WTO (Figure 1.5). These cover a range of crosscutting issues, from digital trade facilitation to privacy and data protection, consumer protection, source code, customs duties on electronic transmissions, and cybersecurity.

In parallel, countries have also started negotiating broader “digital economy agreements”. These include, among others, the Digital Economy Partnership Agreement (DEPA) between Chile, New Zealand and Singapore, and the DEA between Australia and Singapore.¹⁰ These agreements incorporate many of the issues discussed in existing trade agreements, such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), but extend discussions to cover further areas, such as artificial intelligence (AI).

Despite progress in discussing digital trade-related provisions internationally, evidence from the OECD Digital Services Trade Restrictiveness Index (DSTRI)

Figure 1.5: A growing number of RTAs have digital trade provisions

Note: The vertical axis shows the number of RTAs (left axis) and the share of RTAs with provisions or a chapter on digital trade (right axis). The analysis only considers agreements currently in force. “RTAs with digital trade provisions” refers to there being at least one e-commerce/digital trade provision, whether in a separate chapter of the trade agreement or not (e.g., intellectual property provisions which might be important for the digital economy but are not in an individual e-commerce chapter). RTAs are identified using the WTO RTA database (<https://rtais.wto.org/>). Digital provisions sourced from the Trade Agreements Provisions on Electronic-commerce and Data (TAPED) database (<https://www.unilu.ch/en/faculties/faculty-of-law/professorships/managing-director-internationalisation/research/taped/>).

Source: López González, Sorescu and Kaynak (2023).

suggests that domestic regulation affecting digital trade has become increasingly tight. Measures concerning infrastructure and connectivity, which include restrictions on cross-border data flows and data localization requirements, account for the bulk of the increase in the index (see Figure 1.6).

Quantifying digital trade flows in an accurate and comparable way would not only provide long-awaited information to support trade policy discussions, but also provide a basis to analyse and understand the digital trade implications of national regulatory changes, whether through the removal of restrictive measures or the introduction of new ones, and to establish good regulatory practices.

1.4.2 TRADE IN LOW-VALUE GOODS AND *DE MINIMIS* THRESHOLDS

The digitization of information can be a powerful instrument to facilitate trade, as easier data exchange paves the way for faster customs clearance procedures and improved risk management. For example, the World Customs Organization’s (WCO) “Framework of Standards on cross-border e-commerce” prescribes the establishment of a legal and regulatory framework for advance electronic data exchange among the parties involved in an e-commerce supply chain, and requires customs administrations and other relevant

government agencies to enhance facilitation and control measures (WCO, 2022).

The WCO also promotes the enhanced exchange of information and inter-agency cooperation on cross border flows of low-value packages. As a result of the emergence of online platforms, more low-value goods are crossing international borders than ever before, and while this has given rise to new opportunities, not least for individuals and micro, small and medium-sized enterprises (MSMEs), to directly engage in trade, it is also raising new challenges for both measurement and policy (López González and Sorescu, 2021).

Measurement challenges can arise as a result of *de minimis* thresholds, as these can render goods exempt from customs duties and/or taxes, as well as entitle them to expedited procedures with fewer documentation requirements. Despite recommendations to estimate low-value trade in merchandise trade statistics (UN, 2011), the value of goods falling below *de minimis* thresholds is often not recorded. By providing guidance on improving official measures of digitally ordered goods (see Chapter 3), including to better capture low-value trade, this Handbook helps to build the evidence base that will enable a better understanding of the challenges and opportunities raised by small-value goods trade.

1.4.3 COMPETITION POLICY

Online platforms have the potential to affect competition and the structure of markets across various industries. They can generate consumer benefits in many markets, including lower prices, greater accessibility and more variety.

At the same time, their business models can cause questions to be raised about how existing regulatory frameworks need to be adapted to digitalization (G7 Germany, 2022). For instance, the size and reach of certain large digital firms across multiple markets has highlighted the risks of anti-competitive conduct, durable market power (and thus less market dynamism and innovation), systemic risks and rent-seeking (for example, through lobbying) (UNCTAD, 2019).

Therefore, it is important to identify these actors in the digital trade framework separately and to develop relevant statistics that can better assess the role of these intermediaries in international trade.

1.4.4 TAXATION POLICY

Digitalization has provided greater scope for firms to export products to markets without having a physical presence in those markets. This is at odds with the allocation of taxing rights based on physical presence. In addition, digitalization exacerbates already existing challenges concerning profit-shifting, as multinational enterprises (MNEs) can more easily relocate highly valuable intangible assets to low-tax jurisdictions to reduce their tax burdens. This is the case for intellectual property assets, but it is equally true with respect to a whole range of other knowledge-based assets, notably marketing assets.

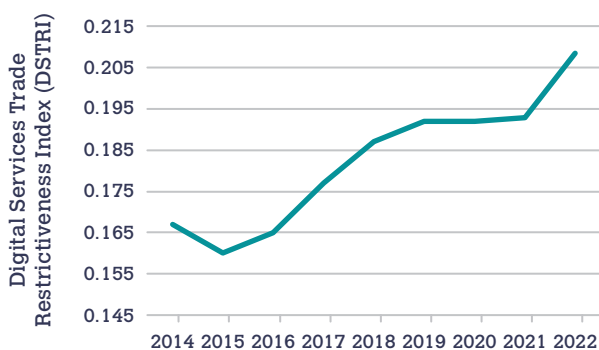
The ability to quantify such digitally delivered flows will help to inform the debate on international taxation, and will potentially administer the two-pillar solution put forward by the OECD/G20 Base Erosion and Profit Shifting (BEPS) framework (OECD and G20, 2021). Under this agreement, Pillar One involves reallocating taxing rights among economies with respect to the share of profits of the world's largest and most profitable MNEs. Pillar One also involves reallocating some taxing rights over MNEs from their home economies to the markets in which they have business activities and earn profits, regardless of whether those MNEs have a physical presence there. Pillar Two involves ensuring that all MNE groups with an annual turnover of more than EUR 750 million will be subject to a minimum effective tax rate of 15 per cent.

Besides corporate taxation, rapid digitalization has also created considerable challenges for indirect taxation frameworks globally, such as for the imposition and collection of value-added tax (VAT) on online sales of services, and physical goods in international trade. For most countries, VAT is the single largest source of indirect tax revenues, and in several developing economies, VAT is the single largest source of all tax revenues (OECD, 2022). The purpose of VAT is to generate government revenue through a broad based tax on final consumption, and it follows that its imposition in international transactions accords the right to tax international supplies to the jurisdiction in which consumption takes place.

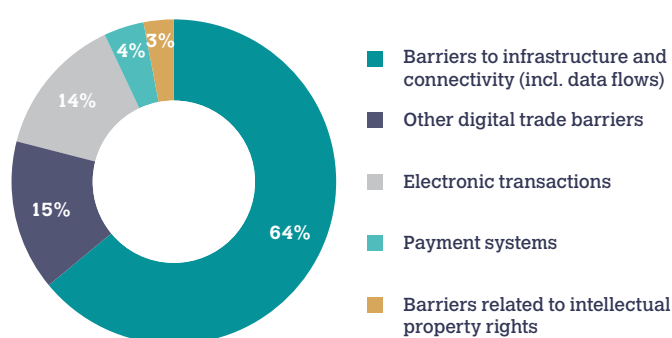
Accurate measurement of digital trade will help governments adapt their taxation frameworks to new business models. At the same time, VAT information itself can be a useful source with which to measure certain elements of digitally ordered trade and digitally delivered trade (see Chapters 3 and 4).

Figure 1.6: Digital trade barriers are intensifying and are concentrated in infrastructure and connectivity issues

A. Evolution of DSTRI over time (2014-22)



B. Share of measures across categories (2022)



Note: Panel A shows the simple average DSTRI for the 74 economies currently covered. The DSTRI ranges between zero and one, one being the most restrictive.

Source: OECD (2022).

1.4.5 ECONOMIC GROWTH AND DEVELOPMENT

Although it is widely accepted that digital trade provides significant new opportunities, there is also a sense that many developing economies are lagging behind in terms of the infrastructure, skills and regulatory environment needed to take advantage of these opportunities (UNCTAD, 2022d). Market openness is a necessary element to enable benefits from digital trade, but it is not sufficient. Comprehensive policy action is needed across skills, trade, competition, taxation, innovation and connectivity policies, if we are to avoid a growing digital divide.

At the 12th WTO Ministerial Conference, WTO members agreed to reinvigorate work under the Work Programme on Electronic Commerce, particularly in line with its development dimension.¹¹ WTO members have also agreed that digital connectivity will be one of the three priority areas in the WTO Aid for Trade work programme for 2023-24.¹² Development cooperation activities should contribute to bridging gaps in digital connectivity and information technology (IT) to support an enabling environment for business and trade facilitation in developing countries and least-developed countries (LDCs).

A challenge here is to ensure that developing economies are also not left behind in their ability to produce evidence for policymaking. This Handbook showcases various developing economy experiences of producing insights on digital trade (see Chapter 6).

1.5 Purpose and structure of the Handbook

The objective of this Handbook is to provide compilers with a statistical definition of digital trade, a conceptual measurement framework and practical compilation guidance on how to make digital trade transactions more visible in existing statistics on international merchandise and services trade.

Building and expanding on its first edition (OECD, WTO and IMF, 2019), this second edition of the Handbook provides several conceptual clarifications, while keeping the definition and the measurement framework broadly unchanged. It builds on extensive consultations with a wide range of national statistical compilers, international organizations and other key stakeholders in the domain of trade statistics and policy analysis. The work presented in this Handbook is at the frontier of statistical measurement and contributes to developing the domain of digital trade statistics by:

- Providing a statistical definition of digital trade and its components;

- Establishing a conceptual framework on how to measure digital trade;
- Proposing a reporting template to record digital trade transactions;
- Providing specific compilation guidance;
- Sharing best practices and case studies.

The Handbook is structured as follows:

Chapter 2 introduces the conceptual framework and reporting template for digital trade.

Chapters 3, 4 and 5 provide compilation guidance on the components of digital trade identified in the conceptual framework: Chapter 3 focuses on the measurement of digitally ordered trade, Chapter 4 presents the measurement of digitally delivered trade, and Chapter 5 addresses the specific challenges related to the recording of transactions enabled by digital intermediation platforms.

Finally, Chapter 6 presents detailed case studies contributed by China, Jamaica, Spain and Türkiye.

The chapters build on existing compilation practices and have greatly benefitted from inputs received from national compilers. Nevertheless, as the domain is still evolving, and compilation practices are not yet well established, the authors of the Handbook recognise that coordinated international effort is still required to address the remaining practical and conceptual challenges.

1.6 Areas of ongoing work

To the extent possible, this Handbook attempts to cover all of the digitalization issues which are of relevance for trade statistics. Nevertheless, it also recognises that in some areas, measurement efforts are still in their infancy, and therefore further conceptual research, as well as empirical testing, will be needed to improve and refine the guidance provided in this Handbook.

For example, more research is needed concerning the coverage of orders via online chat functions, the addition of new services to the list of digitally delivered services as technology advances, and the provision of additional services – such as warehouse services – by digital intermediation platforms.

There are also topics in which conceptual research was ongoing at the time of writing of this Handbook, and therefore these topics have not yet been covered by the conceptual framework. In addition, for certain topics, important compilation challenges persist. Many of these issues are currently being investigated in the context of the update of the UN System of the National Accounts (SNA)¹³ to SNA 2025, and of the IMF Balance of Payments Manual (BPM) to BPM7.

1.6.1 DIGITALIZATION, INVESTMENT AND INTELLECTUAL PROPERTY

Digitalization exacerbates some of the best-known challenges to measuring international trade. For example, intellectual property products can easily be “moved” across international borders, often within the same MNE, and in this case, attributing economic ownership of those intellectual property products, and thus determining the type and direction of the related transactions, is no trivial task (IMF, 2008).

Digitalization has also further blurred the lines between cross-border services transactions (as covered in the balance of payments) and services sales/output through the establishment of foreign affiliates. In the case of digital intermediation platforms and other platforms providing access to intellectual property product content, such as streaming platforms, the lines can become even less clear.

While these issues do not undermine the conceptual measurement framework presented in this Handbook, the complexity of the related transactions calls for the development of further guidance on feasible and comparable compilation approaches based upon country experiences.

1.6.2 CROSS-BORDER DATA FLOWS

Trade and production can be heavily dependent on data and information, which are increasingly being exchanged across borders. Cross-border data flows create new trading opportunities, but also amplify concerns related to privacy protection, digital security, national security, regulatory reach, competition and industrial policy. In order to shape adequate policies around cross-border data flows, it is crucial to develop better measurement of the volume of international data flows and better assessments of the conditions under which data cross borders effectively.

Some international data flows are a direct manifestation of digital trade, arising in the process of an order being placed, or of a service being delivered, through computer networks. The economic value associated with these data flows is accounted for by recording the value of the transaction they facilitate in digital trade. Where data assets (e.g., databases) are traded internationally as products, these transactions are also accounted for in digital trade. At the same time, not all cross-border data flows arise from or are related to trade transactions (UNCTAD, 2021b).

While digitally delivered trade already captures part of the data components of transactions, measuring and recording the value of assets based on the data underlying goods and services transactions is being discussed in the context of the update of the macroeconomic statistical frameworks. Understanding the full implications will require further research and experimentation.

1.6.3 CLOUD COMPUTING

Cloud computing services, defined as “*computing, data storage, software, and related IT services accessed remotely over a network, supplied on demand and with measured resource usage that allows charging on a pay-per-use basis*”, are increasingly used to replace ownership of on-premises IT equipment. The main suppliers of cloud computing services are MNEs with operations spanning many countries and a potentially global customer base. Although paid international transactions in cloud computing should be recorded as trade in services, determining where the service originated and where it was consumed is a challenging task in practice, even if both the countries making and receiving the payment are known.

Moreover, and related to the point above on cross-border data flows, cloud computing often relies on international data transfers between related parties, which take place without a corresponding monetary transaction (IMF, 2022).

1.6.4 NON-LIABILITY CRYPTO ASSETS

Crypto assets are defined as “*digital representations of value that rely on cryptography and decentralized peer-to-peer architecture based on distributed ledger technology (DLT), which enables two parties to directly transact with each other without the need for a trusted intermediary*”. Non-liability crypto assets are those assets designed to act as a general medium of exchange without a corresponding liability, such as Bitcoin and Ether. Within the context of the updates of the BPM6 and SNA 2008, an agreement has been reached in March 2023 to treat non-liability crypto assets as non-produced non-financial assets, and therefore excluding them from the scope of digital trade.¹⁴

A further agreement was made that the recommendation could be revisited if there are significant market, regulatory and/or accounting changes, either before or after the release of the manuals in 2025. Bearing in mind also that the measurement framework proposed in this Handbook is in general consistent with BPM6, no crypto asset is currently considered in scope for measuring digital trade.

1.6.5 COMPLEMENTARY GUIDANCE ON MEASURING THE VALUE OF E-COMMERCE

Digitally ordered trade constitutes a subset of total e-commerce, i.e., where the seller and buyer are in different economic territories. At its meeting in November 2022, the UNCTAD Working Group on Measuring E-commerce and the Digital Economy established a task team to discuss relevant international measurement practices in detail and to work toward developing guidelines to support and encourage countries in measuring the value of e-commerce.

Given the relationship between e-commerce and digitally ordered trade, this effort will support the operationalization and adoption of the compilation guidance set out in Chapter 3 of this Handbook on using surveys to measure digitally ordered trade.

1.7 Putting the Handbook into practice

This Handbook provides a common basis from which statistical compilers can work to produce measures of digital trade. Nevertheless, countries may face various challenges in putting the Handbook into practice, from applying the core concepts to the specific national context and to the available data sources, to compiling and disseminating the resulting statistics.

This Handbook establishes a foundation for an active programme of regional and bilateral technical assistance, capacity-building and workshops, by means of which the four co-authoring partner organizations, the IMF, OECD, UNCTAD and WTO, can support countries in measuring digital trade. This programme of activities can take place within existing activities conducted by the four agencies or through the development of specific programmes on digital trade measurement.

Endnotes

- 1 <https://ec.europa.eu/eurostat/web/digital-economy-and-society/data/database>.
- 2 https://stats.oecd.org/Index.aspx?DataSetCode=ICT_BUS.
- 3 https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=81140&IF_Language=eng.
- 4 Members of the Task Group included UNCTAD, the United Nations Statistics Division (UNSD), the Organisation for Economic Co-operation and Development (OECD), the World Trade Organization (WTO), the International Telecommunication Union (ITU), the Economic and Social Commission for Western Asia (UNESCWA) and the World Bank.
- 5 See <https://www.oecd.org/digital/going-digital-project/>.
- 6 The OECD Working Party on International Trade in Goods and Services Statistics (WPTGS) widely discussed and endorsed this Handbook in their 2020, 2021 and 2022 annual meetings. This Handbook has also been extensively discussed at the UNCTAD Working Group on Measuring E-commerce and the Digital Economy.
- 7 Important progress has also been achieved through the recently agreed G7 Trade Ministers' Digital Trade Principles (<https://www.gov.uk/government/news/g7-trade-ministers-digital-trade-principles>), which cover open digital markets, data free flow with trust, safeguards for workers, consumers and businesses, digital trading systems, and fair and inclusive global governance.
- 8 The original moratorium decision refers to WTO (1998b), while the latest extension is contained in WT/L/1143 and WT/MIN(22)/32 (<https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN22/32.pdf&Open=True>).
- 9 The original Joint Statement on Electronic Commerce from 2017 is accessible here: <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN17/60.pdf>. In January 2019, participants confirmed their intention to commence negotiations on e-commerce (<https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/L/1056.pdf&Open=True>). In a statement dated 20 January 2023, the co-chairs of the discussions (Australia, Japan and Singapore) noted progress on ten articles – “paperless trading, electronic contracts, electronic authentication and electronic signatures, unsolicited commercial electronic messages, online consumer protection, open government data, open internet access, transparency, cybersecurity, and electronic transactions frameworks”. (https://www.wto.org/english/news_e/news23_e/igo_20jan23_e.pdf).
- 10 In addition to the recent DEA between the United Kingdom and Singapore (December 2021), Canada has expressed interest in joining the DEPA, China officially filed an application to join (November 2021), and an agreement has been reached for the Republic of Korea to begin negotiations to join formally. Moreover, in December 2021 Singapore and the Republic of Korea concluded discussion on their Digital Partnership Agreement Korea Singapore Digital Partnership Agreement (KSDPA), which entered into force on 14 January 2023.
- 11 See <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/MIN22/32.pdf&Open=True>.
- 12 See <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/COMTD/AFTW95.pdf&Open=True>.
- 13 See <https://unstats.un.org/unsd/nationalaccount/sna.asp>.
- 14 Fungible crypto assets with corresponding liability, such as stable coins with a claim on the issuer, are considered as financial assets and are also not in scope for international trade.