3. Digitally ordered trade

This Handbook defines digitally ordered trade 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"*. This chapter describes how existing enterprise and household surveys targeting e-commerce provide a basis for measuring digitally ordered trade. It highlights the significant challenges that survey respondents, in particular households, can face when identifying and reporting international transactions, especially when these pass through digital intermediation platforms.

This chapter provides concrete country examples, as well as recommendations, in the context of the use of surveys and additional data sources by compilers to estimate the components of digitally ordered trade.

3.1 Identifying digitally ordered transactions

Digitally ordered trade, as defined in this Handbook, is:

"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".

This is aligned with the 2009 OECD definition of e-commerce (OECD, 2011), but focuses only on international transactions.

The payment and ultimate delivery of the goods or services do not also have to be conducted online. Digitally ordered trade transactions can involve participants from all institutional sectors, and can cover orders made over the internet, via an extranet[1] or via electronic data interchange (EDI) messages[2]; and orders made by phone, fax or manually typed email are excluded (see Box 3.1).

A trade transaction is "digitally ordered" when the order is placed and received *both*:

1. "over computer networks", and
2. "by methods specifically designed for the purpose of receiving or placing orders".

In most cases, the internet will be the "computer network" facilitating digitally ordered trade. Nevertheless, digital orders may also take place through private networks, such as direct network connections between (usually large) companies and their business customers. See Box 2.1 in Chapter 2 for further clarifications on computer networks.

Digital ordering covers orders placed through websites or apps via an "online shopping cart" or order form. This is the case whether the website or app concerned belongs to the seller or is that of a third party, such as an online marketplace or auction site. Digital orders can also be placed through extranet ordering systems and via EDI-type (i.e., machine-to-machine) messages.

Some "chat bots" or "virtual agents" also have features allowing digital orders to be placed. These are "a computer generated, animated, artificial intelligence virtual character that serves as an online customer service representative" (Eurostat, 2021b). Customers place orders through an automated "structured conversation", during which the customer is prompted to provide the information needed to fill in an order form. Orders placed through voice commands issued to virtual assistants (such as those embedded in mobile phones and smart speakers) also meet the criteria outlined above and international transactions should be included in digitally ordered trade.

In most cases, it is straightforward to apply the concept of digital ordering to an international transaction and to identify what transaction value should be included in digital trade. Examples of various digitally ordered transactions are given in Annex B, along with guidance for their entry into the reporting template for digital trade set out in Chapter 2.

However, digital ordering is also a feature in certain more complex transactions. Some digital orders give rise to an ongoing provision of services with accompanying payments (recurring transactions). Examples include subscriptions to streaming media, online software and gaming services, subscriptions for online platform delivery services, and clothing rental subscriptions, among many others.

Although the order is placed only once, the service continues over subsequent periods as long as it is not cancelled and the subscription fee is paid. All transactions associated with international digital orders placed in the current statistical reporting period should be included in digitally ordered trade. In principle, the subsequent transactions can be regarded as digitally ordered (i.e., as an extension of the original digital order) and can also be recorded as digitally ordered trade. However, in practice it is likely that firms will not have the information needed to identify the original ordering method associated with recurring payments – especially for subscriptions which began years or even decades in the past. It may therefore be necessary to estimate the share of total subscription income in the current period arising from digital orders. One possibility is to do so based on the share of digital ordering among subscriptions initiated in the current period. This can be conceived as reflecting the share of digital ordering which would arise if customers had to place a new order each time instead of the service automatically renewing.

In some cases, two parties in different countries may agree an over-arching "framework contract" for the provision of goods or services from one to the other. An example would be an agreement under which a company in Country A becomes the exclusive supplier of certain products to a business in Country B. The framework contract may be negotiated and agreed in person and set parameters such as unit prices, minimum purchase volumes and the duration of the agreement. Online orders ensuing under the agreement should be included in digitally ordered trade.

Box 3.2 looks at how digital ordering is identified and applied in further specific cases.

Having set out the defining features that identify digitally ordered trade transactions, Section 3.2 examines sources and methods for measuring digitally ordered trade. Section 3.3 looks at measuring the overlap between digitally ordered trade and digitally delivered trade. Finally, Section 3.4 identifies key recommendations and presents a summary table offering an overview of the strengths and limitations of the sources available.

Box 3.1: UNCTAD guidance related to the definition of e-commerce

The OECD definition of e-commerce excludes orders placed by phone, fax and manually typed emails. The reason is that these ordering methods were not "specifically designed for the purpose of receiving or placing orders".

Nevertheless, emails and other forms of manually typed messages, such as those sent via messaging apps or social networks, can be used to place and receive orders online. This is particularly the case in some developing countries, where such messaging provides businesses, and especially small businesses, with a low-cost, easily accessible way to take orders via the internet, even when access to digital equipment, infrastructure and skills is limited.

For example, the sharp increase observed in the number of businesses in Brazil selling online during the COVID-19 pandemic (from 56 per cent of all businesses in 2019 to 74 per cent in 2021) was mainly driven by orders placed via messaging apps (from 42 per cent of businesses selling online to 78 per cent), email (39 per cent to 62 per cent) and social networks (20 per cent to 39 per cent). Furthermore, such orders were especially important for firms that sell online through only one channel (UNCTAD, 2023).

In operationalizing the OECD definition of e-commerce, the UNCTAD Manual for the Production of Statistics on the Digital Economy 2020 (UNCTAD, 2021a), states that *"to take into account the different levels of technological development in countries, the Partnership [on measuring ICT for development] recommends collecting data on orders received or placed over the internet, including by email"*. Accordingly, countries may vary in their inclusion or exclusion in e-commerce statistics of orders made by means of manually typed emails. Indeed, several OECD members include orders via email in their published business e-commerce sales figures (UNCTAD, 2023).

This highlights how important it is that all aspects of survey coverage are clearly recorded and communicated to users, in order to allow proper interpretation and comparison of the resulting statistics. In cases where manually typed messages are included within the scope of e-commerce, the value of these transactions should ideally be measured separately from those occurring through other e-commerce channels. If that is not possible (e.g., due to respondent burden), it is recommended to ask respondents if the amounts reported include orders (or purchases) placed via messages, as this gives an indication of the prevalence of this ordering channel and the potential scale of transactions involved. An example of this is available in the UNCTAD model questionnaire for business surveys on the use of ICT (see UNCTAD (2021a), Annex 2).

Source: UNCTAD.

3.2 Measuring digitally ordered trade

As noted in Section 3.1 (and illustrated in Figure 1.4 in Chapter 1), digitally ordered trade consists of international e-commerce transactions. Any e-commerce transaction involves two main parties – a buyer and a seller. These roles may be filled by any combination of businesses, households, government bodies, or non-profit institutions serving households (NPISHs). The most common and widely analysed e-commerce flows are business-to-business (B2B) and business-to-consumer (B2C) transactions.

One implication of this is that measures of businesses' e-commerce revenues and households' e-commerce expenditures in a given economy will partially overlap because of businesses selling to consumers in the same economy. In the international trade context, however, either the buyer or the seller is always outside the compiling economy. Sources measuring digitally ordered sales to, and purchases from, parties abroad by businesses and households in the compiling economy will therefore yield results that are mutually exclusive and additive.

Many e-commerce transactions also involve a third party – a digital intermediation platform (DIP), which acts as an intermediary. This can introduce several complicating factors.

First, the involvement of a third party in the transaction can make it harder to assess whether the buyer and seller are resident in the same country – especially for survey respondents, who may believe they are purchasing from the DIP itself and/or might not know whether the DIP is resident in their country or not. This can lead to cases where a transaction between domestic parties is reported as international e-commerce because the DIP is a foreign resident; or where a cross-border e-commerce purchase is not reported as trade because the DIP is resident in the same country as the buyer.

Second, in facilitating the transaction, the DIP itself provides digital intermediation services to both the seller and buyer, which should be recorded as digitally ordered and digitally delivered trade in cases where the

Box 3.2: Digital ordering in specific cases

Financial, insurance and pension services

As noted in Chapter 2, financial, insurance and pension services are considered to be within scope for digital trade. This is in recognition of the very significant impact that digitalization has had on how these products are subscribed to and supplied, including across borders, even though many of the core services (such as liquidity provision and risk management) do not directly rely on their ability to be digitalized.

Financial, insurance and pension services are considered to be digitally ordered when the customer (whether an individual or organization) applied online for the service – e.g., opening a bank or trading account, taking out a loan, or subscribing to an insurance or pension contract.

Some financial, insurance and pension services may have features of both digital and non-digital ordering. For example, a customer may subscribe online to a share dealing service, paying a monthly fee which would be recorded in digitally ordered trade. Under the contract, the customer might give instructions for the purchase or divestment of shares and as a result have to pay a specific "action fee". The instruction and associated action fee should be regarded as a separate order/transaction and assessed according to whether or not the order was placed digitally.

In some cases, when a customer requests an evolution of a contract, it is necessary to consider this as giving rise to a separate transaction. For example, a business might take out an employee travel insurance policy from a provider located abroad. As the order was placed online, this transaction and ensuing subscription payments are included in digitally ordered trade. Several months later, the company contacts the insurer *by phone* to extend the policy to cover loss or damage to specialized equipment during business travel, increasing the total insurance premium to be paid. This can be regarded as establishing a new contract/transaction, and the ensuing premium payments would be excluded from digitally ordered trade, as the order was placed by phone.

The complexity of financial insurance and pension services may make the above distinctions difficult for some providers of these services to operationalize and report upon. It is recommended that specific guidelines should be developed to help such enterprises in responding to surveys, and that these guidelines should be shared internationally so that other compilers may learn from them.

Mobile roaming services

An individual using their home country SIM card to connect to and receive service from a cell network in a country they are visiting purchases this service from their home country telecommunications provider. The trade transaction is therefore between the host and home country telecommunications providers and should reflect the amount charged by the former to the latter for the roaming service. This amount should be included in digitally ordered trade.

Transactions between affiliated enterprises

A high proportion of imports and exports of goods and services are between affiliated enterprises. Affiliated enterprises can use private networks or proprietary computer systems for the purpose of receiving and placing orders between members of the group. The same principles apply as for trade between unaffiliated enterprises, and orders via such systems would constitute digitally ordered trade.

Source: IMF, OECD, UNCTAD and WTO.

DIP is resident in a different economy from the buyer/seller (even when the buyer and seller are resident in the same country). See Chapter 5 for more on measuring and recording transactions involving DIPs.

No single source can offer a holistic measure for digitally ordered exports and imports at the whole economy level. Figure 3.1 maps potential sources of data on digitally ordered trade according to coverage of digitally ordered export and import trade flows involving different institutional sectors. It also maps the sources' ability to collect data on the digitally ordered trade items in the reporting template for digital trade set out in Chapter 2. The extent of alignment with the digital ordering concept itself is also considered.

As few countries are likely to have all these potential data sources in place, a key purpose of Figure 3.1 is to support compilers in identifying potential sources and considering the coverage they can offer individually and collectively. The section references given in Figure 3.1 indicate where further details on each source can be found in this chapter, while Table 3.2 gives a complementary overview of the strengths and limitations of these data sources in terms of measuring digitally ordered trade.

A key benefit of survey sources is that they can be designed to cover the relevant institutional units, trade flows and reporting items, while also ensuring alignment with the relevant concepts. In contrast,

alternative data sources can offer the potential to avoid the cost and burden associated with surveys, but they often necessitate compromises on the coverage of institutional units or trade flows, the availability of reporting items, or on alignment with the digital ordering concept.

Business transactions are a natural starting point when measuring digitally ordered trade. E-commerce enables businesses to make sales, including across borders. Box 3.3 provides evidence that it is reasonable to assert that businesses account for a significant majority of e-commerce sales by value and that they are therefore also likely to comprise a majority of digitally ordered exports.

Figure 3.1: Institutional sector and conceptual coverage of digitally ordered trade sources

	Businesses								Households				Government/ Non-profit institutions serving households (NPISH)		All institutional sectors			
Source	Information and communications technology (ICT) surveys		Core business surveys		Multinational enterprise (MNE) surveys[1]		Value added tax (VAT) returns[2]		ICT surveys		Card payments[3]		ICT surveys		Customs declarations[4]		Low-value trade estimates[5]	
Section reference	3.2.1						3.2.2		3.2.1		3.2.2		3.2.1		3.2.2			
Exports (X) / Imports (M)	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X	M	X	M
Digitally ordered trade																		
Goods																		
of which: via DIPs																		
Services																		
of which: via DIPs																		
Digitally ordered and digitally delivered trade																		
Legend:	Partial coverage / conceptual alignment (see notes)																	
	Full coverage / conceptual alignment (depending on survey design)																	

Notes:

1 Partial coverage – MNEs only; conceptual misalignment – may include sales through local subsidiaries/affiliates outside the compiling country. MNE surveys tend to focus on sales (exports) and not to cover businesses' purchases (imports).

2 Partial coverage – only VAT registered businesses; may exclude businesses which sell online through channels other than their own website/webshop (e.g., via online marketplaces or EDI); possible over-coverage – may include offline sales by businesses selling online.

3 Partial coverage – only payments made by card; possible over-coverage – may include payments made on corporate/business cards or payments made on personal cards for business purposes. Breakdown into goods, services, digitally delivered services may be possible based on merchant category codes.

4 Partial coverage – only goods above relevant customs/statistical thresholds.

5 Partial coverage – only goods below relevant customs/statistical thresholds.

Section references indicate where further details on each source can be found in this chapter.

Source: IMF, OECD, UNCTAD and WTO.

Furthermore, according to UNCTAD estimates, around 80 per cent of businesses' e-commerce sales (by value) are made to buyers that are also businesses (UNCTAD, 2021c). Thus, sources that capture the purchases businesses make via e-commerce would, by extension, be expected to cover a significant portion of digitally ordered imports.

Businesses are also central actors and stakeholders in all the various policy areas related to digital trade set out in Chapter 1, including international trade and customs policy, competition policy, taxation policy, and economic growth and development. Measures of the value created and captured by businesses through digitally ordered trade are a key area of user need.

Digitally ordered trade involving businesses as both sellers (exports) and buyers (imports) should therefore generally be the highest measurement priority. Nevertheless, situations will vary across countries, and compilers of digital trade statistics should assess the prevalence and importance of cross-border e-commerce transactions involving government units, NPISHs, and, especially, households to establish priorities and ensure that the statistics produced are sufficiently exhaustive and representative.

As goods account for over three quarters of global trade (WTO, 2022), and the limited evidence available suggests that around two-thirds of e-commerce sales relate to goods (see Section 3.3), digitally ordered trade in goods can be another key potential starting point for measurement. The main source for merchandise trade statistics is data gathered through customs declarations. When complemented by low value trade estimates, these provide a holistic measure of all exports of goods from, and imports of goods to, the compiling economy. Implementing the identification of digitally ordered shipments in customs systems offers the possibility of measuring a large component of digitally ordered trade in a way that cuts across institutional sectors and is directly integrated with international merchandise trade statistics (see Section 3.2.2).

A key implication of Figure 3.1 is that it will be necessary to combine data sources to gain statistics representing the whole economy. The subsections following hereafter examine these various data sources in more detail. For example, in certain situations (see Section 3.2.2), card payments data might offer a robust measure for household expenditure on digitally ordered imports that is complementary to measures of business imports derived from surveys (Section 3.2.1). Customs-based measures of digitally ordered trade in goods (Section 3.2.2) would need to be complemented with figures on digitally ordered services imports derived from other sources.

Related to this is microdata linking. For example, by integrating goods and services trade data with responses from business ICT surveys, it would be possible to identify both exporting businesses which make at least some sales via e-commerce and importing businesses which use e-commerce to purchase at least some of their inputs (or to estimate the propensity that a trading business with given characteristics does either of these). With the total imports and exports of these businesses known from goods and services trade sources, further information gathered through ICT surveys or from other suitable sources could be applied to estimate the portion of those trade flows that is digitally ordered.

3.2.1 SURVEY SOURCES

The alignment between the definition of digitally ordered trade transactions and the definition of e-commerce transactions (where the only difference is that the former is confined to transactions between residents and non-residents) means that surveys used to measure e-commerce can offer a foundation from which to measure digitally ordered trade.

Up until now, most efforts to measure the value of e-commerce have focused on businesses and households. Surveys can ask businesses about their sales revenues from e-commerce transactions and about their expenditures on purchases (e.g., of material inputs, services, etc.) via e-commerce. Meanwhile, given the primary role of households as consumers, household surveys have focused more on measuring their e-commerce spending. Nevertheless, there are examples of measuring households' online income from selling items (such as crafts or second-hand items) and/or services (e.g., accommodation, transport, delivery services, etc.).

The following sub-sections examine the use of business surveys, household surveys, and surveys of government units or NPISHs to gather information relevant to measuring/estimating digitally ordered trade.

BUSINESS SURVEYS

ICT surveys

The most widely adopted vehicle for measuring business e-commerce is surveys of ICT usage in business. Including similar but more specific "business e-commerce surveys", it is estimated that nearly 80 countries worldwide have undertaken such collections (UNCTAD, 2023). Annual business ICT surveys are legally mandated for EU member states and also take place in other countries participating in the European Statistical System (i.e., Bosnia and Herzegovina, Iceland, Montenegro, North Macedonia, Norway, Serbia, Türkiye).[5] Annual or biennial surveys are also carried out in most other OECD countries and in Brazil, which also submits statistics to the OECD database on ICT access and usage by businesses.[6]

Box 3.3: Evidence on businesses and households in e-commerce

On average across OECD countries, nearly 30 per cent of businesses received orders over computer networks in 2022.[3] In the same year, around 20 per cent of individuals sold goods or services online.[4] In Canada, 12 per cent of persons aged 15 years or older reported earning money online in 2020. The average earning from online activities was CAD 2,700 (around US$ 2,000). By comparison, in the following year the average e-commerce sales value was CAD 3.7 million across all businesses and over CAD 500,000 for small enterprises (Statistics Canada, 2022a).

In Japan in 2021, it is estimated that business-to-business (B2B) e-commerce transactions amounted to over YEN 370 trillion, business-to-consumer (B2C) e-commerce to almost YEN 21 trillion, and consumer-to-consumer (C2C) e-commerce to just YEN 2.2 trillion (METI, 2022). In 2013, C2C e-commerce accounted for only 1 per cent of the total value of e-commerce sales in the Republic of Korea (Statistics Korea, 2014).

Taken together, this evidence strongly indicates that businesses are the main actors in e-commerce and therefore, by extension, in digitally ordered trade.

Source: IMF, OECD, UNCTAD and WTO.

The frequency of business ICT surveys in other economies is more variable, but there are many examples of recurring collections, especially in Asia, including in China, Indonesia, Malaysia, the Philippines, Singapore and Thailand. Statistics from these countries can be found in the UNCTAD database of core indicators on ICT usage in business.[7]

Alongside monitoring a wide range of ICT uses, these surveys have long been used to ask businesses whether they have adopted e-commerce (UNCTAD, 2021a). Both the share of businesses making e-commerce sales and the share purchasing inputs through e-commerce are among the Core ICT indicators[8] established by the Partnership on Measuring ICT for Development in which the OECD and UNCTAD are active partners, along with various other regional and international organizations.[9] The core indicators have been officially adopted by countries through endorsement at the UN Statistical Commission. Even so, and although information on the *uptake* of e-commerce among businesses is useful for analytical and policymaking purposes, measuring the *monetary value* of e-commerce transactions, including those taking place across borders, is a crucial next step, which will allow e-commerce to be integrated into frameworks for economic statistics, including trade statistics.

To investigate the *value* of business e-commerce, a logical enhancement to business surveys is to ask each business that engages in e-commerce about its income resulting from e-commerce sales and its expenditure on e-commerce purchases. These can either be requested directly as monetary values, or as a percentage of the business' total sales income/expenditure.

A majority of the countries that conduct business ICT surveys have collected at least some value information. For example, EU member states have collected data on the value of turnover from e-commerce orders since 2012. However, as of 2023 only a relatively small number have published monetary figures on the value of e-commerce sales (UNCTAD, 2023).

In many cases, business ICT surveys supplement questions about whether the respondent engages in e-commerce sales with additional requests – most commonly about the customers to whom the responding business sells (businesses, government, consumers), and the sales channels used (own websites/apps, third-party websites/apps/marketplaces, EDI messages). Another common follow-on question asks whether the business has made e-commerce sales to customers abroad. A further extension implemented in a limited number of countries asks for a breakdown of the total value of e-commerce sales, as percentage shares or monetary amounts, for each of the domestic and international components (UNCTAD, 2023). From this information, the business' digitally ordered exports can be derived.

Box 3.4 presents an example of this approach from the Department of Statistics Malaysia, illustrating how the total value of e-commerce sales can either be collected directly as a monetary value or as a percentage of businesses' total sales revenue. It also shows how respondents are requested to provide the breakdown into e-commerce sales to customers domestically and abroad in the form of shares adding up to 100 per cent. The results published in Figure 3.2 show the total value of business e-commerce sales increasing rapidly over time, while the share of sales going to customers abroad also increased.

Also notable in this example is the guidance given to responding enterprises – such as digital intermediation platforms (DIPs) – which receive internet orders on behalf of other entities. In these cases, the DIP is instructed to enter only the fees

earned on the transaction. This mitigates the risk of double counting where the sale of accommodation services, for example, is reported both by the seller (e.g., a hotel) and within the value of transactions reported by the DIP (e.g., a hotel-booking platform). The inclusion in questionnaires of specific guidance such as this to help respondents in lines of business where the digital ordering concept may not be straightforward to interpret and apply, is recommended. As well as DIPs, businesses providing financial, insurance and pension services, and affiliated enterprises might especially benefit from specific guidance (see Box 3.3). For more information on the measurement and recording of transactions involving DIPs, see Chapter 5.

Many countries request more geographical detail on e-commerce sales abroad. For example, in EU surveys, responding businesses have been asked to delineate e-commerce sales to customers in the respondent's own country, in other EU member states and in the rest of the world (see Box 3.5). This was included as a mandatory breakdown for the first time in 2021, having been optional in 2019 and 2017. Importantly, though, the EU surveys do not collect a total value for e-commerce sales, but separate (sub)totals for "web sales" (sales through web sites and apps, including DIPs) and "EDI-type sales".[10] The cross-border breakdown was only specified for web sales, which in 2020 comprised 7 per cent of the turnover generated by businesses with 10 or more persons employed across all EU member states. By comparison, EDI-type sales accounted for almost double this share – 13 per cent of turnover on average. Results from this breakdown of web sales turnover were not released as part of the 2021 Eurostat value of e-commerce sales database.[11]

Several countries have moved toward a model of measuring bilateral digitally ordered trade flows. Box 3.6 presents an example from Canada's Survey of Digital Technology and Internet Use, which collects information on the shares of e-commerce sales revenue coming from different geographic regions and, in some cases, specific countries. The published results for 2021 show that 20 per cent of e-commerce sales by businesses in Canada were to customers abroad, with over three-quarters of these orders (by value) going to customers located in the United States (see Figure 3.3).

The United Kingdom Office for National Statistics (ONS) 2021 Digital Economy Survey took a somewhat similar approach, asking respondents to break down e-commerce turnover by geographic regions (Box 3.7). However, this and other details are nested within an over-arching question on businesses' turnover from sales to customers outside the United Kingdom. This top-down approach has two potential benefits. Firstly, respondents can break down their e-commerce turnover into that coming from abroad versus from domestic customers, even if they are unable to provide further details. Secondly, it allows the turnover from e-commerce sales to customers abroad to be broken down in various additional ways.

Of particular relevance to measuring digital trade is a breakdown into sales of goods, non-digitally delivered services and digitally delivered services, which can yield an estimate for the overlap between digitally ordered trade and digitally delivered trade (i.e., of digitally delivered services ordered via e-commerce). Shown as item 4 in the reporting template for digital trade (see Table 2.1 in Chapter 2), this is crucial to avoid double counting when compiling a measure of total digital trade. Section 3.6 looks at estimation of the overlap in more detail.

The ONS survey also collected a separate breakdown isolating the turnover via "online marketplaces" (i.e., DIPs) relevant to measuring items 2.1.a (digitally ordered trade in goods via DIPs) and 2.2.a (digitally ordered trade in services via DIPs) of the reporting template (see Table 2.1 in Chapter 2). The ONS example also illustrates how business ICT surveys can be used to gather information on a key component of *digitally ordered imports* – namely the value of goods and services ordered, via e-commerce, by domestic businesses from suppliers abroad.

Spain's Instituto Nacional de Estadística (INE) provides a further example of this (see Box 3.8). Published results show that, in total, business e-commerce purchases in Spain amounted to EUR 222 billion in 2020 (for comparison, total business e-commerce sales in Spain were EUR 275 billion in the same year). Spending via e-commerce amounted to 23 per cent of purchases across all businesses, and 45 per cent of purchases by businesses which used e-commerce to buy goods and services. Almost a quarter of these e-commerce purchases by businesses in Spain, EUR 53 billion in 2020, were from sellers/suppliers abroad, the majority of which were in other EU member states (see Figure 3.4).

The examples presented above demonstrate that business ICT surveys can be used to gather extensive detail on digitally ordered exports and imports by businesses – providing a basis for completing many elements of the reporting template for digital trade. Nevertheless, each additional question increases the burden on respondents and may potentially contribute to lower overall response rates. As is always the case, statistical compilers will need to balance the competing need for detailed information with the need to manage respondent burden and response rates. In this regard, it is important to note that the reporting template (see Table 2.1 in Chapter 2) offers flexibility, allowing countries to report key items, such as total digitally ordered trade and the sub-component relating to digitally delivered services, without imposing the need to collect all breakdown items.

Box 3.4: Measuring international e-commerce sales in Malaysia

The following questions on e-commerce sales income, including an apportionment into domestic and international e-commerce sales, were included in the 2020 Malaysia Survey on Usage of ICT and E-commerce by Establishment.

4.2 **Jumlah pendapatan (Merujuk kepada jumlah hasil kendalian / perolehan / jualan dan hasil lain)**
Total income (Refers to operating revenue / turnover / sales and other revenue)

RM 080089

6.5 **Sila nyatakan jumlah pendapatan yang diterima daripada jualan barangan atau perkhidmatan menggunakan e-dagang**
Please indicate the total income that receive orders from sales of goods or services via e-commerce

RM 3100

44

Jika tuan tidak dapat membekalkan nilai,
If you can't provide the value,

Sila nyatakan anggaran peratusan jumlah pendapatan yang diterima daripada jualan barangan atau perkhidmatan menggunakan e-dagang
Please indicate an estimate of the percentage of total income that receive orders from sales of goods or services via e-commerce

45 (%)

Nota / *Notes*:
Bagi pesanan internet yang diterima bagi pihak organisasi lain, sila lapor hanya yuran atau komisen yang diterima
For internet orders received on behalf of other organisations, include only fees or commissions earned

6.8 **Sila nyatakan peratusan pendapatan e-dagang mengikut jenis pasaran**
Please indicate the percentage of e-commerce income by types of market

3100

(a) **Tempatan** *Domestic* 54 (%)

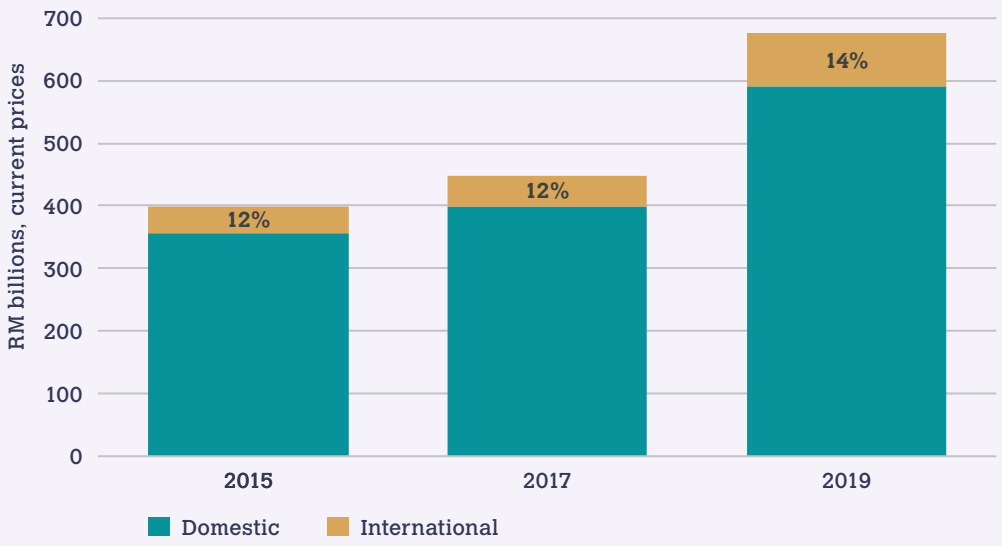
(b) **Antarabangsa** *International* 55 (%)

JUMLAH *TOTAL* 100 (%)

Nota / *Notes:*
Jika peratusan pendapatan antarabangsa e-dagang diisi, sila ke Soalan 6.9
If the percentage of e-commerce international income is filled, please go to Question 6.9

Source: Department of Statistics Malaysia, Survey on Usage of ICT and E-commerce by Establishment 2020, https://www.dosm.gov.my/v1/uploads/files/2_Censuses%26Surveys/Services/ICTeC/2020/Borang-ICTEC-2020.pdf.

Figure 3.2: Business e-commerce sales by customer location, Malaysia



Source: IMF, OECD, UNCTAD and WTO based on Department of Statistics Malaysia (2019; 2021).

Box 3.5: Measuring international e-commerce in businesses in the European Union

The following questions were included in the 2021 European Community Survey on ICT Usage and E-commerce in Enterprises (Eurostat, 2021b). This harmonized survey is implemented by EU member states and partner countries. The same questions were included as optional variables on the 2022 survey.

The harmonized survey only includes a breakdown of *sales via a website or apps* ("web sales") into domestic and international sales; as a result, this breakdown is not widely available for "*EDI-type sales*". This is important because around 65 per cent of e-commerce turnover earned by businesses in the EU27 countries comes from EDI-type sales.[12] Nevertheless, it should be noted that participating countries are free to collect additional details beyond those prescribed in the harmonized survey. For example, Spain has successfully collected and published this breakdown of EDI-type sales since 2015.

Question B2. What was the value of your web sales?
(WEB sales: the customer places the order on a website or through an app)

a) What was the value of your web sales of goods and services in 2020?
_____ (National currency, excluding VAT)

OR

b) What percentage of total turnover was generated by web sales of goods or services, in 2020? _____ %

If you cannot provide the exact percentage an approximation will suffice.

Question B8. What was the percentage breakdown of the value of web sales in 2020 to customers located in the following geographic areas?
(Please refer to value of web sales you reported in B2)
If you cannot provide the exact percentages an approximation will suffice.

a)	Own country	___ %
b)	Other EU countries	___ %
c)	Rest of the world	___ %
	Total	100 %

Source: Eurostat (2021b).

It is important to note that business ICT surveys can vary significantly in their coverage of industries and small firms. In EU member states it is usual for surveys to exclude firms that employ fewer than 10 persons, while surveys in many other countries include such microenterprises. In addition, it is common to omit "Agriculture, Forestry, and Fishing" (ISIC Rev.4 section A), "Mining and Quarrying" (B), and "Public Administration and Defence" (O) from business ICT surveys. Under the EU model, "Finance and Insurance" (K); "Education" (P); "Human Health and Social Work" (Q); "Arts, Entertainment, and Recreation (R)"; and most of "Other service activities" (S) are also beyond scope.

This affects the exhaustiveness, and thus the comparability, of business e-commerce and digitally ordered trade figures across economies (UNCTAD, 2023). For this reason, statistical compilers are recommended to ensure that the coverage of business ICT surveys, and the methods and estimations applied to the responses gathered, are sufficient to derive digitally ordered trade estimates that are representative of all businesses. In any case, it is crucial that any exclusions and limitations in terms of representativeness are communicated to users and documented in metadata.

It should also be noted that business ICT surveys are often addressed to businesses' IT departments. It is therefore recommended to clearly state that the respondent may need to draw on input from colleagues in other relevant departments (e.g., sales/accounting) when responding to questions on sales via digital ordering.

Box 3.6: Measuring international e-commerce sales by trading partner in Canada

The following questions measuring international e-commerce sales by trading partner were included by Statistics Canada in the 2021 Survey of Digital Technology and Internet Use.[13]

Question 21. What was this business's total gross sales conducted over the internet in 2021?
(If precise figures are not available or the year is not yet complete, please provide your best estimate in Canadian dollars)

_____ Rounded to the nearest CAN$

OR

Don't know

Question 22. In 2021, what percentage of the value of this business's gross sales was made over the internet?

_____ %

OR

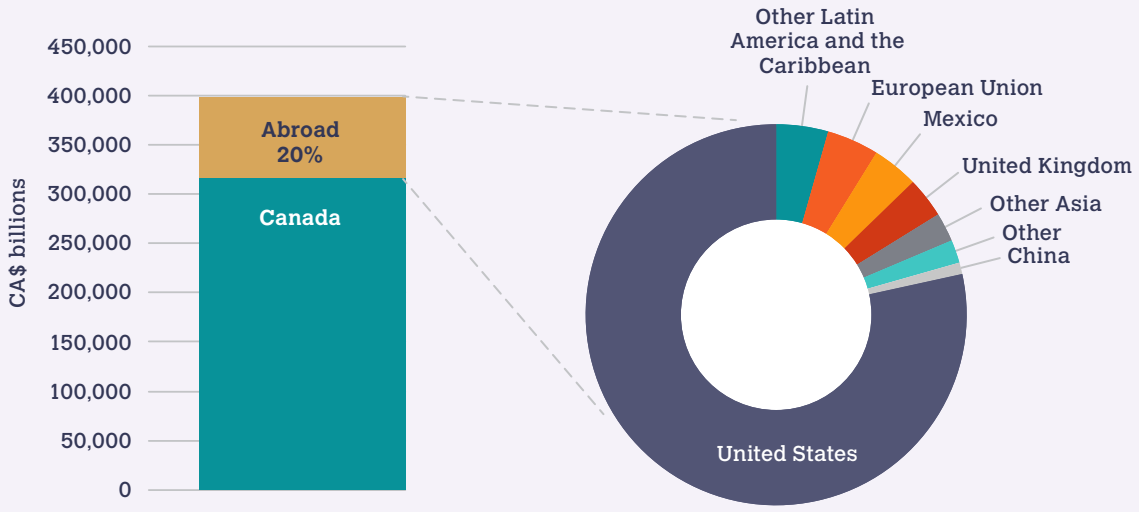
Don't know

Question 26. What percentage of the value of this business's gross sales conducted over the internet were obtained from each of these regions in 2021?

a)	Canada	___ %
b)	United States	___ %
c)	Mexico	___ %
d)	Other Latin America and the Caribbean	___ %
e)	China	___ %
f)	Other Asia	___ %
g)	The European Union	___ %
h)	The United Kingdom	___ %
i)	Other regions	___ %
	Total	100 %

Source: Statistics Canada (2021).

Figure 3.3: Business e-commerce sales by customer location, Canada, 2021



Source: Statistics Canada

Box 3.7: Measuring international e-commerce sales and purchases in the United Kingdom

The following extract from the UK Office for National Statistics 2021 Digital Economy Survey demonstrates the collection of a considerable range of details for both international e-commerce sales (exports) and purchases (imports) by businesses. These include the trading partners involved, the sales channels used – including online marketplaces (DIPs), and the types of products sold and purchased.

During 2021, what was your business's turnover from e-commerce sales to customers located outside the UK? _____ £ (pounds sterling)

How much of the value of the turnover from e-commerce sales to customers located outside the UK came from the following areas?

- **a)** European Union countries ___ £
- **b)** Other European countries (excluding UK constituent countries) ___ £
- **c)** Africa ___ £
- **d)** Australasia and Oceania ___ £
- **e)** Asia ___ £
- **f)** The Americas and the Caribbean ___ £

How much of the value of turnover from e-commerce sales to customers located outside the UK came from each platform?

- **a)** Turnover from e-commerce sales via your business's own website or app ___ £
- **b)** Turnover from e-commerce sales via your business's own social media ___ £
- **c)** Turnover from e-commerce sales via an online marketplace ___ £
- **d)** Turnover from e-commerce sales via EDI ___ £
- **e)** Turnover from e-commerce sales via other platforms ___ £

How much of the value of the turnover from e-commerce sales to customers located outside the UK came from the following?

- **a)** Turnover from e-commerce sales of goods ___ £
- **b)** Turnover from e-commerce sales of digitally delivered services ___ £
- **c)** Turnover from e-commerce sales of non-digitally delivered services ___ £

During 2021, what was your business's expenditure on e-commerce purchases from suppliers located outside the UK? _____ £

How much of the value of expenditure on e-commerce purchases from suppliers located outside the UK was spent in the following areas?

- **a)** European Union countries ___ £
- **b)** Other European countries (excluding UK constituent countries) ___ £
- **c)** Africa ___ £
- **d)** Australasia and Oceania ___ £
- **e)** Asia ___ £
- **f)** The Americas and the Caribbean ___ £

How much of the value of expenditure on e-commerce purchases from suppliers located outside the UK was on the following?

- **a)** Expenditure on e-commerce purchases of goods ___ £
- **b)** Expenditure on e-commerce purchases of digitally delivered services ___ £
- **c)** Expenditure on e-commerce purchases of non-digitally delivered services ___ £

How much of the value of expenditure on e-commerce purchases from suppliers located outside the UK, was spent on each platform?

- **a)** Expenditure on e-commerce via a business's website or app ___ £
- **b)** Expenditure on e-commerce purchases via other platforms ___ £

Source: United Kingdom Office for National Statistics.

Box 3.8: Measuring business e-commerce purchases from abroad in Spain

The following questions from the Instituto Nacional de Estadística Survey on the use of Information and Communication Technologies and Electronic Commerce in companies 2020 illustrate how ICT surveys can be used to measure the money businesses spend on purchases made via e-commerce, and to delineate domestic purchases from international purchases (digitally ordered imports).

Amount of total purchases of foreign goods and services made by the company in 2020

Net purchases of goods and services represent the value of all goods and/or services purchased during the reference year, either for resale or for consumption, in the production process or in the ordinary course of business. These purchases must be valued at the acquisition price in net terms.

Total amount of purchases of foreign goods and services (excluding VAT) _____€

Purchases by Electronic Commerce in 2020

E-commerce purchases through the web or mobile applications: *These are purchases made through a store online or through forms on a company website, extranet or via mobile applications.*

Purchases by electronic commerce through EDI: *These are purchases made through Electronic Data Interchange type messages, understanding the term EDI as a standard format suitable for automated processing (e.g., EDI (e.g., EDIFACT), XML (e.g., UBL)).*

Orders by messages or emails written manually are excluded.

Purchases of goods or services include the value of goods and services purchased during the accounting period for resale or consumption in the production process excluding the consumption of capital goods which is recorded as consumption of fixed capital.

Indicate, as an estimated percentage of the total amount of purchases made, the amount of purchases corresponding to orders/reservations of goods or services performed through web pages or mobile applications in 2020 (excluding VAT) ___ %

Break down, as an estimated percentage, of the amount of purchases made through web pages or mobile applications in 2020 by geographical area (excluding VAT)

a)	Spain	___ %
b)	Other EU countries	___ %
c)	Rest of the world	___ %
	Total	100 %

Indicate, as an estimated percentage of the total amount of purchases made, the amount of purchases corresponding to orders/reservations of goods or services made through EDI messages or similar in 2020 (excluding VAT) ___ %

Break down, as an estimated percentage, of the amount of purchases made through EDI messages or similar in 2020 by geographical area (excluding VAT)

a)	Spain	___ %
b)	Other EU countries	___ %
c)	Rest of the world	___ %
	Total	100 %

Source: Instituto Nacional de Estadística (2020).

Figure 3.4: Business e-commerce purchases from abroad, Spain, 2021

Source: IMF, OECD, UNCTAD and WTO based on Instituto Nacional de Estadística (2022c).

Core business surveys

As an alternative to ICT surveys, some countries measure the total value of e-commerce sales through questions included on "core" macroeconomic business surveys. For example, the Annual Survey of Philippine Business and Industry was used to measure "sales from e-commerce transactions", broken down by ISIC Rev.4 industry sections (Philippine Statistics Authority, 2020). In Singapore, the Annual Services Industry Survey has been used to measure the "e-commerce revenue of the services sector", with a breakdown by industry and customer type (business or consumer) (Statistics Singapore (SingStat), 2021). In the United States, the Census Bureau measures e-commerce sales through the separate annual surveys of manufacturing, services, retail and wholesale businesses. Together, these offer a fairly comprehensive overall value for business e-commerce sales (United States Census Bureau, 2021).

Although none of these surveys measure international e-commerce transactions, information on the total value of e-commerce may be combined with information collected on imports and exports by these businesses to derive first estimates of digitally ordered trade. Such collections could, in principle, be built upon in a similar top-down approach to that outlined for business ICT surveys above. In so doing, routine business activity surveys could become a vehicle for measuring digitally ordered trade. This approach could offer some benefits compared to ICT surveys, including wider coverage of industries and firm sizes and closer integration of the resulting measures with major economic aggregates such as gross value added of the business sector and GDP.

Mainstream enterprise surveys that gather headline information on digitally ordered sales and purchases can also be used alongside more detailed ICT surveys (if appropriate assumptions are made and care is taken). This approach would combine the benefits of population coverage of the mainstream surveys with the more detailed breakdowns that can be collected in the ICT survey.

Another possibility could be to add questions on digital ordering to international trade in services surveys. While these surveys do not cover digitally ordered goods, this could be a useful approach for collecting further information on digital ordering directly integrated into the key sources for data on services trade transactions, and could potentially provide insights on the overlap between digital ordering and digital delivery. Furthermore, in countries where the collection of economic data is fragmented across multiple sector specific questionnaires, and potentially across multiple statistical agencies, it may be easier for compilers of international trade statistics to add questions to the appropriate trade survey(s).

Given the emphasis on developing a better understanding of the digital economy more generally, and of digital trade in particular, statistical compilers should explore whether additional relevant questions could be mainstreamed in core business surveys used to derive structural business statistics and/or in international trade in services surveys. The sample survey questions and experiences presented for business ICT surveys could serve as a starting point for developing questions for use in other business surveys.

Multinational enterprise surveys

Surveys of multinational enterprises (MNEs) offer yet another possibility for collecting data concerning digital ordering as well as digital delivery (see Chapter 4) and digital intermediation platforms (see Chapter 5).

While MNEs comprise a subset of businesses, and such surveys will not, therefore, cover all digital trade transactions, they can account for a large share of goods and services trade. For example, in the United States, over 90 per cent of services trade and a majority of goods trade was driven by MNEs (Bruner and Grimm, 2019). Questions on surveys of MNEs therefore have the potential to measure a considerable portion of digital trade.

MNEs can be included in general balance-of-payments surveys (e.g., international trade in services surveys), or they can be surveyed separately for the required official international accounts statistics. Units in national statistics offices or central banks responsible for dealing with MNEs, known as large case units (LCUs), are common; their goal is to ensure that MNEs are well understood by statistical compilers and correctly represented in economic statistics. The LCU may collect additional information on MNEs, such as balance sheets or income statements and sales (to both domestic and foreign customers), that can contribute toward measures of digital trade.

MNEs are also often surveyed on topics of special interest, such as the digital economy. They may be asked if they engage in online sales and asked to report on the share of their sales revenues arising from digital sales, as well as the share of their sales that are digitally delivered (see Box 3.9). The resulting data can be used alone to give partial measures of digital trade or can be combined with trade data at an aggregate or microdata level to produce more exhaustive digital trade statistics. An additional benefit of collecting information on digital trade data via MNE surveys is that information can be collected for trade in goods and in services in the same survey.

HOUSEHOLD SURVEYS

E-commerce has made it much easier for households to find and buy products from abroad, as well as providing opportunities for them to sell goods and services online. Surveys of ICT access and usage in households and by individuals have been used to measure the proportions of individuals purchasing and selling goods and services online at the whole economy level (ITU, 2020).[14] As for business surveys, it is less common that information on the value (as opposed to the incidence of) of e-commerce transactions by individuals, and furthermore of cross-border transactions, has been collected.

Box 3.9: Measuring digitally ordered trade by multinational enterprises in the United States

The United States Bureau of Economic Analysis (BEA) has collected shares of sales that are digitally ordered or digitally delivered using its surveys of the activities of multinational enterprises.

Questions were first introduced in the BEA 2019 Benchmark Survey of US Direct Investment Abroad for both US parent companies and their foreign affiliates. The questions collected the shares of:

1) services sales that are digitally delivered;
2) services sales that are digitally ordered; and
3) goods sales that are digitally ordered.

Similar digital economy questions have been included in the 2022 BEA Benchmark Survey of Foreign Direct Investment in the United States.

As is typical of special topic questions, they were only included on the version of the form filed by the largest reporters. Respondents were asked to report the shares using checkboxes that indicated percentage ranges, and to provide reasonable estimates based on informed judgement, sampling techniques or prorations (i.e., proportional calculations) based on related data if direct measures were not available and indicating the basis for their responses. As many survey respondents are not familiar with the concepts of digital ordering and digital delivery, it was necessary to include simple definitions, prepare supplementary guidance and follow up directly with many respondents to ensure accurate responses.

TABLE 3.1: BEA MULTINATIONAL ENTERPRISE QUESTIONS ON DIGITAL ORDERING AND DELIVERY, 2019

Digitally ordered pertains to the sale of a good or service conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders, negotiating terms of sales or price. This covers orders placed over an electronic data interchange, the internet, mobile devices, or any other online system.

Digitally delivered services are those that are delivered remotely over information and communications technology networks — i.e., over voice or data networks, including the internet, or in an electronically downloadable format.

	Check the appropriate percentage range (check one)							**The information provided is based on (check one)**	
	0%	1- 24%	25-49%	50-74%	75-89%	90-99%	100%	Accounting records	Recall/general knowledge of operations
Percentage of sales of services reported that were **digitally ordered**	…	…	…	…	…	…	…	…	…
Percentage of sales of goods reported that were **digitally ordered**	…	…	…	…	…	…	…	…	…
Percentage of sales of services reported that were **digitally delivered**	…	…	…	…	…	…	…	…	…

Source: U.S. Bureau of Economic Analysis benchmark survey of U.S. direct investment abroad 2019 (https://www.bea.gov/be-10-benchmark-survey-us-direct-investment-abroad).

Among responding US parent companies, the overall share of services that were digitally ordered was 25 per cent (estimated by multiplying the midpoint of the percentage range by the reported sales for each respondent, then adding up all respondents), while the share of goods that were digitally ordered was 19 per cent. These shares were higher for foreign affiliates – between 30 and 35 per cent. Responses varied considerably across industries, with digital ordering being most prevalent for services in the Information Services and Professional, Scientific, and Technical Services industries, and for goods in the Manufacturing and Retail Trade industries.

Three in four US parent companies and two in three affiliates reported responding based on recall or general knowledge of operations rather than accounting. Furthermore, just over half of US parents did not respond to these questions. The BEA follows up directly with many respondents to ensure accurate responses and is exploring ways to account for non-responses and for MNEs which were not asked the digital economy questions.

Source: United States Bureau of Economic Analysis.

In principle, the information needed from households is equivalent to that needed from businesses, though as households are primarily consumers rather than producers, efforts have tended to focus more on measuring households' e-commerce expenditure. Within that expenditure, any transactions where the seller is resident in a different economic territory would amount to *digitally ordered imports*.

Several different forms of survey questions have been used to measure individuals' or households' spending online.

In the 2021 European Community Survey on the Use of ICT in Households and by Individuals (Eurostat, 2021c) respondents are asked to provide their estimated total purchases made via websites or apps [15] over the three months prior to being surveyed, or to indicate it in the form of spending bands (see Box 3.10). Countries may vary in their implementation of this question by offering either or both of these response options.

The resulting dataset, compiled and published by Eurostat, shows that it was most common for respondents to have spent between EUR 100 and 299 via websites and apps over the three months prior to being surveyed – although this varies from one country to another. In addition, 21 per cent of individuals (aged 16-74) had made online purchases from sellers outside their country of residence (Figure 3.5). However, because the questions on seller location and the value of online spending are separate from one another, the survey does not provide a measure of the share of online spending attributable to purchases from abroad.

The 2020 Canadian Internet Use Survey adopted a different approach, asking respondents for the specific amounts they spent on various online purchases of goods and services (Box 3.11). This has the benefit of allowing e-commerce transactions to be categorized into those relating to goods, digitally delivered services, and other services (Figure 3.6), and so double counting of transactions that are both digitally ordered *and* digitally delivered can be avoided when total digital imports are calculated. However, the 2020 survey did not distinguish between domestic and international e-commerce.

In contrast, the 2018 edition of the Canadian Internet Use Survey asked several questions with an international dimension. Respondents were asked if their online orders of physical goods were "delivered from" merchants in Canada, in the United States, from other countries, or from "merchants of unknown country of origin", although, as in the European survey, this breakdown was not applied to the amount spent on goods. In testing questions that link the domestic/international and monetary dimensions, it was found that respondents had difficulty identifying cross-border transactions. For example, an order placed on Amazon.ca might be reported by some respondents as an order from a local business ("Amazon Canada"), especially when the product concerned is shipped from a warehouse in Canada. But others would report it as an international transaction due to the fact that Amazon is an "American company", or due to an awareness that the products bought originate from other parts of the world. Nevertheless, such efforts provide valuable experience, and a basis on which to develop and test additional options to capture the value of digitally ordered imports by households.

In some cases, household surveys have also been used to measure the money made online by individuals. Within those earnings, any transactions with a buyer resident in a different economic territory would amount to *digitally ordered exports*. For example, the 2020 Canadian Internet Use Survey (Statistics Canada, 2020) included this among questions on "online work" (see Box 3.12). Again, the international dimension was not collected, and so these results cannot be used directly to measure digitally ordered exports by households.

The evidence suggests that household surveys can yield meaningful results on the share of digital ordering in overall household expenditure and on the income that households earn by making sales online. Comparing those shares to total business e-commerce sales and purchases would provide some insight into the potential economic significance of digitally ordered imports and exports involving households.

Ideally, household surveys should also collect information on whether the product purchased or sold is a good, a digitally delivered service, or a service delivered via another channel. Further breaking down household e-commerce spending according to the products purchased could yield useful insights relevant to measuring digital trade. If there are no major domestic suppliers of a particular product, such as music streaming services, online gaming, or online storage, for example, then spending on such products implies imports of digitally ordered and digitally delivered services. Indeed, such details are one area where household surveys can also prove useful for measuring expenditures on digitally delivered products (see Chapter 4).

Collecting details can also be useful with respect to online earnings. For example, in economies with limited domestic tourism, earnings from providing platform-based peer-to-peer accommodation will mainly imply digitally ordered exports. Such product details will not give the full picture on digitally ordered trade involving households but may nevertheless offer meaningful insights.

Other household surveys could in principle be expanded to collect information on the value of international digitally ordered transactions in a similar way to business surveys. However, some prior efforts suggest that respondents struggle to delineate domestic and international transactions accurately and consistently. Survey questions and methods in this area are still at an early stage of development and further design, testing, and experimentation is needed to identify the best ways to gain meaningful results.

Box 3.10: Measuring e-commerce spending by individuals in the European Union

The following questions from the 2021 European Community Survey on the use of Information and Communication Technologies in Households and by Individuals (Eurostat, 2021c) gathered information on the amount individuals spent online and the location of the sellers they bought from. These questions were also included in the 2020 survey.

Estimate how much money you have spent in total on your purchases via a website or app for private use in the last 3 months.

_____ national currency

Or (tick one)

- ☐ Less than 50 euro
- ☐ 50 to less than 100 euro
- ☐ 100 to less than 300 euro
- ☐ 300 to less than 500 euro
- ☐ 500 to less than 700 euro
- ☐ 700 to less than 1000 euro
- ☐ 1000 euro and more
- ☐ Don't know

From whom did you buy the mentioned goods via a website or app in the last 3 months? Include online purchases from enterprises or private persons (tick all that apply)

1. a) National sellers
2. b) Sellers from other EU countries
3. c) Sellers from the rest of the world
4. d) Country of origin of sellers is not known

Figure 3.5: Individuals' e-commerce spending, EU and partner countries, 2021

Source: IMF, OECD, UNCTAD and WTO based on Eurostat digital economy and society database.[16]

Box 3.11: Measuring e-commerce spending by individuals in Canada

The Canadian Internet Use Survey 2020 (Statistics Canada, 2020a) included questions collecting detailed information on online spending by individuals across goods, digital services, and other services. However, the survey did not attempt to distinguish domestic and international purchases.

The following questions are about your online orders of digital goods and services, physical goods and other services, including what you personally ordered online for yourself, your household and other people. Your answers should relate to your use from any location, and exclude business-related use. Include only orders where the commitment to buy was made online.

During the past 12 months, what is your best estimate of the amount you spent on physical goods ordered over the internet?

If precise figures are not available, please provide your best estimate in Canadian dollars.

_____$ OR Of the following ranges, what would you estimate to be the amount you spent on physical goods ordered over the internet during the past 12 months? (tick one)

- ☐ 1: Less than $200
- ☐ 2: $200 to less than $500
- ☐ 3: $500 to less than $1,000
- ☐ 4: $1,000 to less than $5,000
- ☐ 5: $5,000 or more

During the past 12 months, how much did you spend on the following digital goods or services?

Music downloads or streaming subscriptions	_____$	Online gambling	_____$
Video downloads or streaming subscriptions	_____$	Online gaming, gaming applications, game downloads or in-game purchases	_____$
E-books, audio books or podcast books	_____$	Online data-storage services	_____$
Video or audio podcasts, excluding podcast books	_____$	Online courses or learning	_____$
Online newspapers or magazines	_____$	Other applications, software or online subscriptions	_____$
Digital gift cards purchased online, for online redemption	_____$	Other digital goods or services ordered over the internet	_____$

[During the past 12 months,] what is your best estimate of the total amount that you personally spent on [peer-to-peer] accommodation services [such as Airbnb and Flipkey]? _____$

During the past 12 months, what is your best estimate of the amount you spent on other services ordered over the internet?

_____$ OR Of the following ranges, what would you estimate to be the amount you spent on other services ordered over the internet during the past 12 months? (tick one)

- ☐ 1: Less than $200
- ☐ 2: $200 to less than $500
- ☐ 3: $500 to less than $1,000
- ☐ 4: $1,000 to less than $5,000
- ☐ 5: $5,000 or more

Figure 3.6: Average online shopping expenditure by product type, Canada, 2020

Note: Peer-to-peer accommodation are services that connect travellers and hosts through a mobile application or website that acts as an intermediary and processes the payment from the traveller to the host. Examples of peer-to-peer accommodation intermediaries are Airbnb and Flipkey.

Source: Statistics Canada (2022b).

Box 3.12: Measuring online earnings by individuals in Canada

The question below, which measures earnings by individuals from online activities including e-commerce sales, was included on the Canadian Internet Use Survey 2020 (Statistics Canada, 2020a):

The following question is about money that you personally earned online in the past 12 months. Please remember that your answers will be kept strictly confidential.

During the past 12 months, how much did you personally earn by doing the following activities online?

Selling physical goods online that you built or created	_____$
Selling services via online bulletin boards	_____$
Providing platform-based peer-to-peer accommodation services	_____$
Providing platform-based peer-to-peer ride and delivery services	_____$
Providing other platform-based peer-to-peer services	_____$
Online freelancing	_____$
Crowd-based microwork	_____$
Earning income through online advertisements and sponsored content	_____$
Other activities	_____$

In 2022 (Statistics Canada, 2022c), the survey included instead a question collecting an overall amount of online earnings from these activities:

> *The next question relates to income earned over the internet from self-employment contract arranged through online platforms, such as on-demand jobs in the "gig economy" or the sale of services or goods that you created. Remember that your answers will be kept strictly confidential.*
>
> *Workers in the gig economy are usually not employed on a long-term basis by a single firm; instead, they enter into various contracts with firms or individuals (task requesters) to complete a specific task or to work for a specific period of time, either in person or digitally, for which they are paid a negotiated sum. Examples include Uber, Lyft, TaskRabbit, Upwork, Guru, Fiverr, Freelancer, or incomes earned through online advertisements and sponsored content.*

During the past 12 months, what is your best estimate of the income you earn from contracts arranged over the internet related to the gig economy or the sale of services or goods that you created? _____$

The results from 2020 found average earnings from online activities of CAD 2,700 (around USD 2,000). By quite some margin, the most common ways of earning money online were "selling physical goods online that you built or created" (7 per cent of those aged 15 or over in Canada, with average earnings of almost CAD 1,700) and "selling services via online bulletin boards [such as eBay or Kijiji]" (4 per cent, CAD 1,500), while the highest earnings were generated through "online freelancing" (0.7 per cent, around CAD 10,000 on average) and "other activities" (2.3 per cent and around CAD 19,000 on average).

The extent to which some of these would count as earnings from e-commerce sales, and hence be relevant for digitally ordered trade, is unclear. Income from selling accommodation, ride and delivery, or other services through online platforms, would clearly meet the definition of digital ordering. It is also likely that many online sales of physical goods by individuals also take place through digital intermediation platforms such as eBay or Etsy, although some will be sold via manually typed messages sent in response to advertisements placed on online bulletin boards. Manually typed emails or other forms of written messages may also be important for the other activities listed. Canada does not include orders placed via manually typed emails in e-commerce.

Source: Statistics Canada.

One potential area where household surveys could be directly linked to digital trade concerns expenditures abroad and tourist expenditures in the compiling economy. Specific questions could be added either to conventional household expenditure surveys or to international travel surveys to identify the share of expenditures on accommodation and (separately) travel services purchased abroad that were digitally ordered (as in Figure 3.7), which may help to identify and quantify potential underestimates in these areas (see Box 3.13).

Similarly, conventional household income surveys could be used to ask households if they provided short-term accommodation services via digital intermediation platforms and the income generated. While such questions would not differentiate (at least initially) between accommodation services provided to

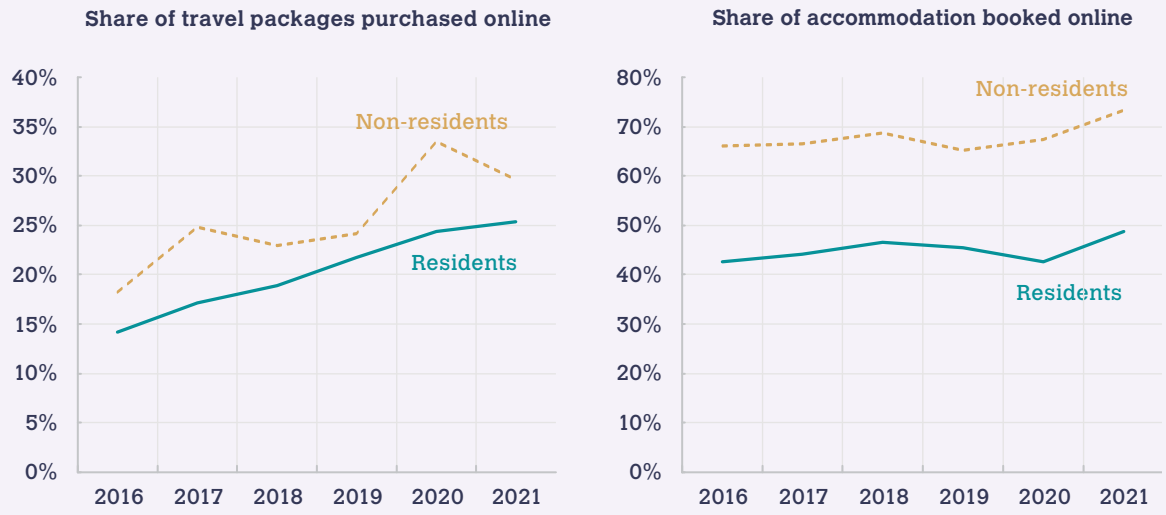
Box 3.13: Compiling digitally ordered travel transactions in Italy

The Bank of Italy has been running an extensive face-to-face border survey since 1996 providing information on various features of Italy's inbound and outbound international tourism, such as the number and characteristics of visitors and visits, the number of night stays, the means of payment used, etc.

Since 2016, specific questions have been added to gather information on the use of online tools for booking or buying travel services. Travellers are asked about: a) online purchases of "all-inclusive" travel packages; b) online booking of accommodation; and c) the channels used to book the accommodation online.

In the period 2016-21, expenditure on "all-inclusive" trips purchased or booked online increased from 14 per cent to 25 per cent for residents in Italy, and from 18 per cent to 30 per cent for non-residents. Online booking of accommodation, in the same period, increased from 43 per cent to 49 per cent (for residents) and from 66 per cent to 73 per cent (for non-residents).

Figure 3.7: Share of travel packages and accommodation booked online in Italy (%)



Source: Bank of Italy.

residents and those provided to non-residents, it would suggest an order of magnitude and an upper estimate.

Finally, it should be noted that most, if not all, e-commerce sales by individuals/households would not take place without DIPs. For more information on measuring and recording transactions involving DIPs, see Chapter 5.

SURVEYS OF GOVERNMENT UNITS AND NPISHS

As noted in Section 3.1, all kinds of institutional units can engage in e-commerce and digitally ordered trade as buyers or sellers. As a result, exhaustive measures should cover purchases and sales by government units and non-profit institutions serving households (NPISHs) – though in some cases the latter may be covered in business surveys.

There are few examples of surveys of ICT usage in these institutional sectors, and those have tended to focus on the digitalization of processes such as e-procurement rather than on the value of transactions involved. As such, it will likely be necessary to use other sources, such as government budgetary management reporting systems, to collect relevant information.

In most cases, though, it is likely that business and household transactions make up the significant majority of digitally ordered trade flows. Coverage of government and NPISHs may, therefore, have a lower priority. However, the situation in some economies will vary; statistical compilers should consider the potential for these sectors to be engaged in statistically meaningful volumes of digital trade and adapt the coverage of surveys (and other sources) accordingly.

3.2.2 CUSTOMS DECLARATIONS AND OTHER SOURCES

Although surveys are a promising source for estimating digitally ordered trade, various other sources can

Box 3.14: WCO Framework of Standards on cross-border e-commerce

The WCO's Framework on Standards on cross-border e-commerce is based on eight guiding principles for cross-border e-commerce outlined in the Luxor Resolution[17] adopted at the 2017 WCO Policy Commission meeting. In particular, Principle V – Measurement and Analysis underpins Standard 15: Mechanism of Measurement, which stipulates that: "Customs administrations should work with relevant government agencies in close cooperation with E-Commerce stakeholders to accurately capture, measure, analyse and publish cross-border E-Commerce statistics in accordance with international statistical standards and national policy, for informed decision making." The WCO E-Commerce Package[18] provides Technical Specifications for this Standard. The work to implement this standard has the following aims:

- Establish a set of common terminologies and reliable mechanisms to accurately measure and analyse cross-border e-commerce in close cooperation with international organizations such as the International Civil Aviation Organization (ICAO), Organisation for Economic Cooperation and Development (OECD), United Nations Conference on Trade and Development (UNCTAD), United Nations Statistics Division (UNSD), Universal Postal Union (UPU), World Economic Forum (WEF), World Bank Group and World Trade Organization (WTO), as well as with national statistical organizations and e-commerce stakeholders;
- Use data analytics (including "big data" modules) and the existing capabilities of international organizations, e-vendors/e-platforms, and other stakeholders, with a view to generating trends and analysis for evidence-based decision-making to support the implementation of the Guiding Principles and the efficient and sustainable growth of cross-border e-commerce;
- Establish mechanisms, including supporting legal framework, to capture data at item level to facilitate the development of e-commerce trade statistics, while implementing simplified clearance processes, for example the consolidated simplified summary declaration.

Source: IMF, OECD, UNCTAD and WTO.

provide measures for key components of digitally ordered exports and imports.

In particular, relevant information may be available, or have the potential to be collected through, various administrative and private channels, as set out in the following sub-sections.

CUSTOMS DECLARATIONS

Customs records are the main data source underpinning international merchandise trade statistics. Identifying digitally ordered shipments within customs sources therefore offers the possibility of measuring digitally ordered imports and exports in a way that cuts across institutional sectors and is directly integrated with international merchandise trade statistics.

Among these efforts, the World Customs Organization (WCO), in collaboration with public and private sector actors in international e-commerce, is leading an initiative to better identify and monitor digitally ordered trade in customs records via improved electronic identification of the origin, destination and content of packages, for example via the S10 bar code for postal items, or special (often simplified) declaration forms for e-commerce orders.

The WCO's work is governed by its "Framework of Standards" on cross-border e-commerce (see Box 3.14), which offers, among other things, structural guidance on measuring e-commerce (i.e. digitally ordered) transactions and aims to establish global standards in the e-commerce supply chain, including a harmonized approach to risk assessment, clearance/release, revenue collection, and border cooperation, from both trade facilitation and customs control perspectives.

Several economies have started to explore ways of making digital trade visible in merchandise trade statistics by exploiting specific customs procedure codes. China Customs, which is responsible for the publication of official international merchandise trade statistics in China, is making significant advances in this area, supported by government policy aiming to create an environment conducive to e-commerce development (see Box 3.15 and Chapter 6). Similarly, the Turkish Statistical Institute (TurkStat) and the Ministry of Trade in Türkiye have jointly developed a methodology based on "traditional" customs records (where a specific field was added to identify digitally ordered transactions), electronic customs declarations and postal data to derive reliable estimates of digitally ordered merchandise exports and imports (see Chapter 6).

DE MINIMIS AND LOW-VALUE INTERNATIONAL TRADE ESTIMATES

Digital ordering is a key factor behind the strong growth of international parcel shipments (Boffa, De Borba and Piotrowski, 2021). One illustration of the

Box 3.15: Measuring cross-border merchandise e-commerce using customs data in China

In recent years, e-commerce has flourished in China, making it one of the world's largest e-commerce markets. This growth has brought challenges for the accurate measurement of cross-border e-commerce involving goods, related to high-frequency and low-value transactions. As the institution responsible for producing official Chinese merchandise trade statistics, China Customs has developed new approaches to ensure the statistical coverage of these transactions, covering both B2C and B2B trade (see also Chapter 6).

For B2C cross-border e-commerce transactions, China Customs has established a specialized Cross-border E-commerce Clearance System (CBECS). Specific customs regime codes identify goods that are cleared via CBECS. Customs allow the release of B2C cross-border e-commerce goods via a simple declaration which combines and cross-validates the original orders, logistics and payment data, while e-commerce platforms declare summarized data to customs afterwards for statistical and other purposes.

Since e-commerce platforms typically have high-quality data management systems to oversee the entire chain of transactions, logistics and payments, information is easy to collect and report. China Customs uses the information on orders obtained from e-commerce platforms both within and outside China to develop statistical estimates on the overall scale of cross-border e-commerce. By also incorporating administrative records of cross-border logistics and cross-border payments, using big data methodologies, China Customs can compare and cross-validate the data to improve the accuracy of measurement. This approach delivers complete, accurate and timely statistical information.

For B2C goods cleared as mail parcels and courier deliveries rather than through CBECS, China Customs and the postal agency have carried out a pilot survey, using sampling methods to determine the proportion of e-commerce postal parcels, to estimate the scale of cross-border e-commerce merchandise trade via postal channels.

For B2B transactions, China Customs encourages exporters to declare whether the goods are ordered via e-commerce. This information will be used for a future statistical survey to further estimate and validate these data.

Source: China Customs.

Box 3.16: Low-value trade estimations in the United States

Since the 1960s, the United States has promoted the reduction of trade flow processing costs by exempting low-value transactions for both imports and exports from the burden of additional procedures and paperwork. The United States Census Bureau provides estimates for low-value trade statistics[25] below a threshold of US$ 2,500 for exports and between US$ 800 and US$ 2,000 for imports. Low-value trade does not include *de minimis* trade, which comprises certain imports below US$ 800 that are exempt from duties and some customs procedures.

Exports statistics are estimated in two parts: trade delivered by small package courier and non-courier country-specific low-value trade. For the low-value trade delivered by small package couriers, research has been undertaken to develop a "courier factor" equal to the ratio of total low-value trade to total high-value trade by small package couriers. Low-value trade transported by small package couriers is estimated by multiplying this factor by the value of high-value trade delivered by small package couriers.

Non-courier low-value trade is estimated by using a country-specific factor multiplied by each country's trade from the prior (or current, if available) month. This is done for US exports to all countries covered except Canada, estimates for which are separately generated under the United States-Canada Data Exchange.

In contrast, import statistics are mostly based on low-value import data, rather than estimated. These data are obtained from excess electronically filed data that are typically omitted from the original statistics because they are reported at a more aggregated level than the vast majority of goods trade data. These data are then supplemented with three additional types of low-value transactions: 1) estimates of low-value data filed via paper; 2) estimates of low-value trade transported by courier; and 3) data on low-value trade transacted within foreign trade zones either via paper or electronically.

Source: United States Bureau of Economic Analysis.

scale and pace of this increase is the rapid growth of the number of small consignments entering Japan, from 12.3 million consignments in 2010 to 63.4 million in 2020.[19]

Many of these shipments are of relatively low value and so fall below customs *de minimis* thresholds – a minimum value, weight, size and/or amount below which customs duties or taxes will not be collected and for which details are therefore not required to be reported to customs authorities. In many cases, *de minimis* thresholds only relate to goods intended for personal use.[20] Digitally ordered trade falling below *de minimis* thresholds will not be covered by measures based on customs declarations and therefore need to be separately measured or estimated in order to arrive at fully representative statistics.

An OECD-IMF Stocktaking Survey (OECD, 2016) showed that *de minimis* thresholds vary widely across countries. For example, among OECD countries, the threshold ranges from GBP 15 (around US$ 17) in the United Kingdom to US$ 2,000[21] in the United States. Some countries also apply a volume threshold, and these can vary for each tax or duty applied. Some countries indicated having different *de minimis* thresholds for postal shipments or which vary by type of transport. In most cases, *de minimis* trade amounts to around 1-3 per cent of total trade, but it can reach over 15 per cent for some economies.

As international trade in merchandise below *de minimis* thresholds is not directly recorded by customs authorities, the value of these flows needs to be separately estimated when merchandise trade statistics are compiled. Overall, around half of OECD countries, as well as several non-OECD countries, produce measures or estimates of *de minimis* or low value trade for balance-of-payments and international merchandise trade statistics purposes.[22]

Various sources are relied upon, including national postal services, administrative reports from customs, card payment information or estimation models (OECD, 2016). The resulting estimates can offer a perspective on digitally ordered trade flows because of the interrelation between increasing *de minimis* trade and digital ordering. However, while there is likely to be a strong correlation between growth in *de minimis* transactions and growth in digital ordering,[23] it is important to note that not all *de minimis* trade will be digitally ordered. Care is therefore needed in using *de minimis* trade estimates as a basis for estimates of digitally ordered trade. In particular, estimates based on information from postal delivery providers can provide relatively robust estimates of overall low value and *de minimis* trade but only if the estimation process covers at least major postal and courier service providers, covering all transport modes.

Some countries have a wider regime for "low-value" international trade under which traders avoid some administrative checks (e.g., customs), and possibly duties and or taxes. For example, in the Republic of Korea, goods imports for personal use and with a value of less than US$ 150 are exempt from tariff and VAT (i.e., are *de minimis*), goods with a value of between US$ 150 and US$ 2,000 are subject to a "simplified import declaration" which has 57 fields (i.e., low-value trade), and goods over US$ 2,000 are subject to the full "General Import Declaration", which has 69 fields and also requires full documentation, e.g., invoices, licences/permits, etc.

Another example is the European Union, which, following an amendment to the Union Customs Code Delegated Regulation, made it possible from 1 January 2021 to declare goods up to EUR 150 using a customs declaration that requires one third of the data compared to a standard declaration[24]. Box 3.16 provides a further example of differentiation between *de minimis* and low value trade from the United States.

Such low-value trade regimes normally collect the information needed to accurately track and measure low-value trade, and in many cases could be enhanced to gather information on digitally ordered low-value transactions as well. For example, since 2012, Türkiye has used electronic trade customs declarations to measure low value digitally ordered trade. Declarations are issued electronically by authorized express airline cargo companies and help to expedite customs processes. There is an upper limit of EUR 15,000/300 kilogrammes for exports and of EUR 150/30 kilogrammes for imports on the eligibility for electronic declaration (see Chapter 6 for more details).

Taking this a step further, some countries have started to apply different administrative procedures specifically for e-commerce enterprises. Such arrangements may offer additional data in the compilation of digitally ordered goods trade statistics. In the Republic of Korea, for instance, registered e-commerce companies are subject to special customs reporting which reduces paperwork and expedites clearance (as well as possibly offering some duty and tax exemptions). Goods arriving in Australia destined for a private individual, which are valued at less than AUD 1000 and which have been ordered through an online supplier, are subject to goods and sales tax (GST), which must be paid by the supplier (see Box 3.17).

VAT RETURNS DATA

Among other things, a business's value added tax (VAT) return includes the value of its total sales and purchases. Sales revenues and expenditures are not typically broken down by channel (e.g., online vs offline). Nevertheless, if businesses selling online can be identified within the total set of VAT returns, their responses can be used to gain insights on the value of e-commerce sales and digitally ordered trade (see Box 3.18).

Box 3.17: Capturing digitally ordered low-value imports via administrative data in Australia

On 1 July 2018, the Australian Taxation Office implemented a vendor collection model for goods and services tax (GST) on low-value imported goods. The model requires certain non-resident suppliers, including platforms, merchants and re-deliverers, to register for, apply and collect GST on low-value imported goods sold to consumers in Australia.

The model does not apply to business customers in Australia, nor to goods valued at over AUD 1,000 (this being the *de minimis* value in Australia). In other words, the model is specifically aimed at digitally ordered imports, to level the playing field for domestic businesses which previously faced unfair competition from non-resident online sellers that were not required to apply GST on the sale of their goods (creating a price advantage).

In simple terms, for goods arriving in Australia that are valued at less than AUD 1,000 and which were digitally ordered by households in Australia through a non resident supplier (e.g., a merchant platform), the GST on the value of the good is expected to be paid by the supplier directly to the Australian Taxation Office (ATO).

Since the introduction of the model, Australia has seen high compliance, with all major platforms among the suppliers registering and completing GST collection and remittance obligations. In the 2020-21 Australian financial year, the ATO collected AUD 225 million in GST revenue from low-value imported goods (up from AUD 161 million collected in the 2018-19 financial year).

Source: Australian Bureau of Statistics.

Box 3.18: Measuring cross-border e-commerce from webshops in the Netherlands

To measure expenditure by Dutch consumers in non-Dutch "webshops" located in the European Union, Statistics Netherlands (Centraal Bureau voor de Statistiek – CBS) used the Dutch VAT returns filed by foreign EU companies, which are mandatory across the European Union for all traders exporting more than a certain threshold (EUR 35,000 or EUR 100,000 per year, depending on the EU member state) to another EU member state.

To identify webshops among all the VAT returns, the information was first combined with data from the Bureau Van Dijk (a private publisher of business information) ORBIS database (see Meertens et al., 2019), to select those enterprises engaged in retail as their primary or secondary activity (and therefore which trade only in goods). In the absence of common identifiers, records were matched using company names. This process required significant editing to avoid false negatives due, for example, to differences in punctuation marks (dots, commas, dashes) or abbreviations (e.g., LTD versus LIMITED). In this process, CBS worked together with the University of Amsterdam and Leiden University to implement big data analytical techniques to achieve faster and more accurate linking.

Subsequently, this overview of companies was paired with internet data collected through web scraping to identify the websites of the shops through which products can be ordered online. Webpages were identified on the basis of the company name, with sites checked automatically for the display of a shopping cart. This identification of webshop features was re-checked manually for the largest foreign companies in terms of turnover size in the Netherlands. Through these manual checks, a rough estimate was made of the measurement errors in the algorithm, which amounted to approximately 5 per cent of turnover. Based on this, the next version of the algorithms can be "trained" using machine learning, in order to further reduce measurement errors.

The results indicate that Dutch consumers spent over EUR 1 billion (excluding VAT) on products sold by foreign EU webshops in 2016, an increase of 25 per cent relative to 2015, and a value six times higher than that previously recorded by means of demand-side surveys among consumers. More than half of all online purchases were made at webshops located in Germany, followed by the United Kingdom, Belgium and Italy. Clothing and shoes were the most common items that were purchased.

Source: Statistics Netherlands.

CARD PAYMENT DATA

Various private sector agents hold data on large volumes of online transactions. In particular, financial institutions, including banks, that issue payment cards, global payment processing networks, such as Visa and Mastercard, and specialist online payment processors, such as Alipay and PayPal, record relevant transactions in their role facilitating online payments. If access for statistical purposes can be agreed, data from these sources can provide a powerful basis for measuring digitally ordered trade. Digital intermediation platforms are also key conduits for a large number of online transactions, as considered in Chapter 5.

Card payment data (also referred to as credit card data) is a source being explored by multiple countries, especially with respect to digital ordering by households. This refers to data on individual purchases paid for using cards (credit cards, debit cards, etc.) issued by providers in a given economy. These data, or summary aggregates, may be made available to statistical compilers under agreements with card issuers.

Alongside the transaction amount, card payment data includes supplementary information. Transactions are recorded as "card-absent" (or "card-not-present") when a card is used online to pay for an order. For these transactions, the "merchant outlet country" is usually available. Combined with information on the country in which the card was issued, this gives a way to identify international transactions and thus to derive an estimate for digitally ordered trade.

Merchant category codes, another component of card payment data, that are used to identify the type of business in which a merchant is engaged, can give an indication of the product that was digitally ordered. This may be of analytical interest and can, potentially, provide a basis for trying to identify payments for digitally delivered services within the estimate of the value of digitally ordered transactions.

Box 3.19 and Box 3.20 provide examples of this approach.

While card payment data hold considerable promise as a tool for measuring household e-commerce expenditures and digital trade, there are various limitations and challenges that must be accepted or managed.

Digital ordering is defined by the order being placed, rather than the payment being made, over computer networks. Although online payment often accompanies the placement of an online order, this is not always the case. Indeed, in some countries, alternative means of payment, such as cash on delivery or wire transfer, are widespread, and differences in the prevalence of the use of cards to pay for digital orders are likely to affect the comparability of measures across economies.

Furthermore, card-absent transactions can arise in some other situations, such as when an order is placed and card details are given by phone, or when an order is placed in person but payment is made online. In addition, households are not the only institutional units that make card payments. While it may be possible to filter out transactions made with corporate or business cards, some transactions on personal cards are made on behalf of businesses (such as when an employee uses their own card to pay for business travel and accommodation that will be reimbursed by their employer). Depending on the prevalence of these various factors in a given economy, there may be a risk of significantly under- or over-estimating digital ordering by households on the basis of card-absent transactions.

Box 3.19: Using credit card data to measure cross-border online purchases in Israel

Benefitting from the legal framework in place allowing access to credit card information, and a memorandum drawn up with three major companies, the Israeli Central Bureau of Statistics (CBS) has started to develop estimates of digitally ordered purchases from abroad by consumers.

Credit card companies provided monthly or quarterly data covering the period from 2012 onwards, and currently report approximately two weeks after the end of the quarter.

Data are separately available showing expenditures by Israeli tourists abroad (providing a measure of tourism expenditures) and expenditures by Israeli residents cleared through foreign websites, providing insights on digitally ordered trade.

The data are classified according to Merchant Category Codes (MCC) – a classification of businesses made by credit card companies – and relate to households only (business credit cards were excluded), taking into account only those transactions where cards were not present (as these primarily refer to online purchases, although they may include purchases made by telephone or fax).

Source: Israel Central Bureau of Statistics (CBS).

In addition, the merchant outlet country will not always reflect the country in which the seller is located. For example, rules for payments through Visa, a major global card payment network, state that:

"A merchant must use its principal place of business as the merchant outlet location for card-absent transactions – that is the fixed location where the merchant's executive officers direct, control, and coordinate the entity's strategy, operations, and activities. A merchant may have only one principal place of business for it and its

Box 3.20: Using card payment data to measure cross-border online purchases in Spain

A collaboration between the OECD and the Spanish Bank BBVA provides an example of using card payment data to gain insights on cross-border transactions. Analysis of card payment transactions by BBVA customers in Spain provided novel insights into consumers' online consumption patterns and the determinants of domestic and cross-border expenditure flows.

Online transactions are proxied by card-not-present transactions, implying that the payment card was not physically involved for the transactions, such as when a customer makes an online purchase via a home computer or mobile device.

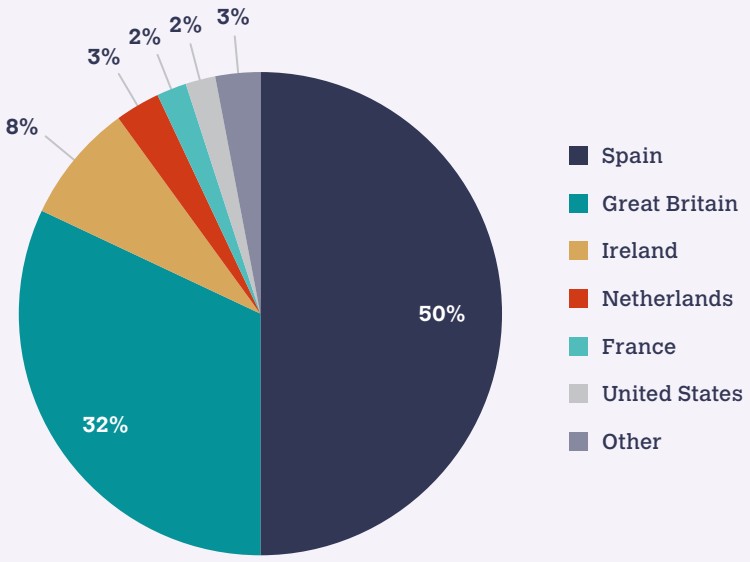
The data available for this analysis was limited to transactions taking place in 2015, though in principle the underlying data would allow the analysis to be repeated even with daily frequency.

The total number of online transactions recorded was 45.8 million in 2015, with a "total transaction value of several billion euros" across both "business" and "private" customers. The sample of transactions analysed, which comprised close to 60 per cent of the total transaction value, excluded business customers but accounted for over 96 per cent of all online transactions of private customers. About 50 per cent of these transactions were outward-bound, to a total of 115 countries. It should be noted, however, that country-specific legislation prevents certain countries from being identified in the data. These countries were excluded from the analysis but potentially account for a substantial part of online transactions. For instance, the data does not contain transactions to merchants in Germany.

Cross-border payments from Spain are highly concentrated in only a few countries (Figure 3.8), with Great Britain, Ireland and the Netherlands alone accounting for about 85 per cent of transactions involving foreign merchants. This distribution is partly explained by the fact that the data refers to monetary transactions rather than trade flows. Thus, in many cases, monetary transactions will be linked to the geographic location of merchants' fiscal headquarters and will not resemble the actual shipping route.

Figure 3.8: Online payments made with cards issued in Spain, by destination country, 2015

Share of total online payments (based on card-absent transactions)



Source: OECD (2019d).

group subsidiaries. In the case of a corporate group, the merchant location is determined at the corporate group level (i.e., as a single entity). For example, this means that a multinational merchant must use its principal place of business as the merchant location and may only use the country of a subsidiary if that country qualifies as an additional merchant location" (Visa, 2021).

For this reason, the location information recorded in card payment data can reflect corporate structures and other distorting factors, rather than geographical reality, as illustrated in Box 3.20.

While this is problematic when measuring bilateral trade flows, it is not necessarily a critical issue if the aim is simply to identify how much money cardholders in a given economy have spent via card-absent transactions with sellers abroad. In that case all that matters is that the seller is outside the economy of the cardholder; the specific country abroad in which they are located is not taken into consideration.

It may also happen that a cardholder in country A may make a purchase from a foreign subsidiary in Country B of a company that has its headquarters in country A, and for which the merchant outlet country is therefore also country A. In this case a digitally ordered trade transaction would be incorrectly labelled as a domestic transaction. This is most likely to create measurement challenges in countries that host headquarters of multinational corporations and/or DIPs.

Transactions routed through DIPs can create additional complications. If both the digital intermediation platform (DIP) and the ultimate seller are located abroad, the transaction would, in any case, be correctly identified as digitally ordered trade. However, it may be that a cardholder in country A makes a purchase from a seller also in country A, but through a DIP with its merchant outlet country abroad. In this case, the purchase would be incorrectly labelled as an international transaction in its entirety, when, in fact, only the fee for intermediation services provided by the DIP should be recorded in digitally ordered (and digitally delivered) trade.

To address this, it may be possible to work with the payment data provider to identify card payments made to popular DIPs for separate treatment. For example, in some cases payments made in the domestic currency via DIPs for services such as ride-sharing, food delivery or accommodation might imply that they are domestic transactions, while payments in foreign currencies could be recorded in digitally ordered trade.

Another limitation of the information available in card payment data is that the merchant category code may not provide an accurate depiction of the products ordered when the merchant or platform offers a wide range of products. For example, the merchant category code assigned to a company that sells computer hardware, software, maintenance services, and training is unlikely to reflect all these products.[26]

Finally, there is the overarching issue that card payment data is held by private sector banks and payment processing companies. Access to these data, subject to suitable data protection arrangements, may require payment or may otherwise need to be negotiated or legislated for. Even if access can be achieved, legislation in third countries can impact the availability of some information, as is the case for Germany in Box 3.20. In addition, although the estimates in Box 3.20 could, in principle, be updated frequently (even on a daily basis), time series analysis was not possible in this case, as the OECD was only granted access to transaction data from 2015. Ongoing access is crucial for card payment data to be useful as a source to produce statistics on digitally ordered trade. In some countries, central banks have such access – see for instance the daily Credit and Debit Card Statistics published by the Central Bank of Ireland.[27]

Overall, a favourable institutional environment, sound understanding of the payment processes and of the nomenclatures, and a widespread use of payment cards are key prerequisites for an appropriate use of payment card data in trade statistics (UN et al., 2010). In the right context, and if the issues outlined can be managed, card payment data have the potential to offer a relatively straightforward means to estimate overall household expenditure on digitally ordered purchases, as well as to estimate households' digitally ordered imports.

3.3 Estimating the overlap between digitally ordered and digitally delivered trade

Digital trade is defined as "all trade that is digitally ordered and/or digitally delivered". As set out in chapters 1 and 2, meeting either of these criteria – being digitally ordered or digitally delivered – is sufficient to qualify a given trade transaction as digital trade. As further elaborated in this chapter, any trade transaction that is digitally ordered should be measured and included when compiling statistics on digitally ordered imports and exports.

Many digitally ordered services are also digitally delivered. Examples include media streaming subscriptions, many consumer telecommunications subscriptions, medical appointments booked online and digital intermediation services (see Chapter 5). Such transactions are therefore also recorded within digitally delivered trade.

This *conceptual overlap* does not pose any particular difficulty when compiling totals for digitally ordered trade and digitally delivered trade. However, it does mean that the two cannot simply be added together to obtain total digital trade, as this would result in double counting. For this reason, measures of imports and exports of services that are *both* digitally ordered *and* digitally delivered should be compiled and entered

under item 4 of the reporting template for digital trade (see Chapter 2). This amount is then subtracted when calculating total digital trade to avoid double counting.

It is, therefore, important to find data sources that can measure not only total digitally ordered trade, but can identify the subset which is also digitally delivered. This chapter has noted several examples of relevance.

The United Kingdom Digital Economy Survey (Box 3.7) breaks down businesses' e-commerce sales abroad and purchases from abroad by product, i.e., goods, digitally delivered services and other services. The second of these will yield an estimate of services that are digitally ordered and digitally delivered.

Canada has also collected a breakdown of the total value of business e-commerce by product types using its business ICT usage survey. In 2021, 62 per cent of private sector firms' gross sales conducted over the internet were sales of physical goods, 18 per cent were digitally delivered services, and 20 per cent were other services (Statistics Canada, 2022d). Although this information does not specifically refer to international e-commerce, it offers a basis for estimating the conceptual overlap between digitally ordered exports and digitally delivered exports, in order to derive an estimate of total digital exports by businesses.

Similarly, surveys of ICT usage in households and by individuals can also collect information on the amounts spent on digitally ordered and digitally delivered services (Box 3.11), as well as online earnings from providing digitally delivered services (Box 3.12).

The product information given by the merchant category codes used in card payment data may also provide a basis for identifying international online (card-absent) payments for digitally delivered services. For example, Visa has a discrete merchant category code for "Cable, Satellite and Other Pay Television/Radio/Streaming Services", as well as codes for merchants providing various products "delivered in an electronic format", including books, films, digital artwork/images, music, games and applications (Visa, 2021).

The product information needed to measure or estimate the subset of digitally ordered trade that is also digitally delivered is an area in which it could be especially useful to combine information from multiple sources. For example, household expenditure surveys could provide an indication of household spending on digitally delivered services, that could in-turn provide a basis from which to derive an estimate of the share of households' international e-commerce expenditures relating to digitally delivered services. Similarly, information from business registers or other business surveys may be useful in identifying firms that produce digitally delivered services and whose e-commerce sales can therefore be treated as digitally delivered.

In all cases, the sources, methods, and assumptions used to measure or estimate services *digitally ordered and digitally delivered* should be clearly communicated to aid user understanding and international comparisons.

3.4 Recommendations

This chapter has examined both survey sources and non-survey sources as bases for measuring digitally ordered trade. No single approach offers direct and complete measurement of all digitally ordered exports and imports. Nevertheless, many relevant examples are available, based on which the following recommendations can be identified:

1. **Digitally ordered trade can involve businesses, households, government units, and NPISHs, as exporters or importers.** Compilers of digital trade statistics should assess the extent to which each of these are engaging in statistically meaningful amounts of digital trade, and should prioritize measurement efforts accordingly. In most cases, transactions involving businesses as sellers (exporters) and buyers (importers) are likely to be the biggest single components of digitally ordered trade. In the absence of evidence to the contrary, these transactions should be prioritized for measurement.
2. **Business ICT surveys can offer a valuable, and in many cases already existing, vehicle with which to measure digitally ordered exports and imports by businesses.** It is recommended that business ICT surveys collect the value of total business e-commerce sales and purchases, as well as a breakdown of these into domestic e-commerce and digitally ordered exports and imports. It is also recommended that information on the products concerned (e.g., goods, digitally delivered services, other services) be collected, as this provides the information prescribed in the reporting template for digital trade. In addition, identifying services digitally ordered and digitally delivered is crucial for the aggregation of total digital trade.
3. It is recommended that statistical compilers ensure that **the coverage of business ICT surveys, and the methods and estimations applied to the responses gathered, are sufficient to derive digitally ordered trade estimates that are representative of all businesses.** Furthermore, to support international comparability, business ICT surveys should follow relevant international guidelines, such as in the UNCTAD Manual for the Production of Statistics on the Digital Economy (UNCTAD, 2021a) and the OECD Model Survey on ICT Usage by Businesses (OECD, 2015a).
4. Statistical compilers are also strongly encouraged to explore whether relevant questions, along the lines of those used in business ICT surveys, could be **mainstreamed in core business surveys** used to derive structural business statistics and/or in international trade in services surveys. Surveys of multinational enterprises can also be useful vehicles for collecting information on digital ordering. Also encouraged are hybrid strategies, in

which representative totals for the value of digitally ordered transactions are collected using core business surveys and combined with breakdown details available from business ICT surveys or other business sources.

5 **In cases where manually typed emails are included, it is recommended that the value of these transactions should be measured separately** from transactions made via e-commerce channels. If that is not possible (e.g., due to respondent burden), it is recommended at least to **specifically ask respondents if they received orders, or made purchases, via email**, as this will give an indication of the prevalence of email ordering and the potential scale of transactions involved.

6 It is recommended that business survey questionnaires are designed with additional guidance or other means of **managing cases where there is a risk that the same transaction will be reported twice** (in part or in whole), such as for respondents receiving orders on behalf of other firms (e.g., operators of online marketplaces, which should only report the fees or commissions earned on the sale), and for respondents in industries where e-commerce concepts may be less straightforward to apply, such as financial services.

7 **Statistical compilers should also seek to measure digitally ordered trade involving households as buyers (importers) and sellers (exporters).** In the absence of that, it is recommended that the value of household e-commerce spending and earnings be measured in total (both domestic and international transactions), to gauge the extent of these transactions in comparison to business e-commerce sales and purchases. This comparison provides some insight into the potential economic significance of digitally ordered imports and exports involving households. Ideally, household surveys should also collect relevant information on the products purchased and sold, as this can give insights relevant to measuring digital trade (most notably whether the product concerned is a good, digitally delivered service or other service).

8 **Household and/or international travel surveys should include questions** asking respondents to identify expenditures on accommodation and (separately) other components related to their foreign travel that were digitally ordered. Non-resident visitors could also be asked, in international travel surveys, for similar (digitally ordered) purchases from residents. In addition, to assist in providing an upper limit for exports of accommodation services provided by resident households, conventional household income surveys should also ask questions about short-term accommodation services they supplied that were ordered through DIPs.

9 It is recommended that statistical compilers ensure that **the coverage of household ICT surveys, and the methods and estimations applied to the responses gathered, are sufficient to derive digitally ordered trade estimates that are representative of all households.** Furthermore, to support international comparability, household ICT surveys should follow relevant international guidelines, such as those of the ITU Manual for measuring ICT access and use by households and individuals (ITU, 2020) and The OECD Model Survey on ICT Access and Usage by Households and Individuals (OECD, 2015b).

10 **Customs records can offer direct measures of e-commerce (goods) shipments captured as they cross the border.** It is encouraged that the WCO Framework of Standards on e-commerce be implemented, including provisions for the identification of shipments ordered by e-commerce. Furthermore, statistical compilers are encouraged to work closely with customs authorities to ensure that statistical needs are taken into account when designing and implementing customs reporting processes.

11 **Many low-value international goods shipments (especially parcel trade), including those that fall below de minimis customs thresholds (or are otherwise not fully recorded in customs data) result from digital ordering.** Countries can therefore endeavour to estimate these transactions to gain a partial perspective on digitally ordered trade. A variety of sources may provide a basis, including in some cases administrative data from customs authorities which provide streamlined declaration forms and procedures for low-value transactions. Information provided by postal and express courier agencies can provide meaningful estimates, as long as coverage of providers is high and all modes of transport are representatively covered, as can tax data, in some cases.

12 **Card payment data provides considerable potential to estimate the total value of digitally ordered expenditures by households.** While there are many challenges involved in identifying the part that is international trade and the type of product covered by the transaction, countries are encouraged to explore this potential, not least as such data can offer a cost-effective way of producing estimates for a component of digitally ordered trade.

13 **Information from different sources should be integrated to derive digitally ordered trade estimates representative of all institutional units in the whole economy.** In all cases, it is crucial to record and communicate the sources used and the coverage of digitally ordered trade estimates in terms of concepts, firm sizes, industries, etc., to enable users to understand the statistics correctly and to facilitate international comparisons.

To support users in considering different sources for measuring digitally ordered trade, Table 3.2 provides a brief overview of the strengths and limitations of the sources set out in this Chapter

TABLE 3.2: STRENGTHS AND LIMITATIONS OF SOURCES FOR MEASURING DIGITALLY ORDERED TRADE

Source	Strengths		Limitations
Business ICT surveys	Can measure the two biggest components of digitally ordered trade – exports and imports by businesses in the compiling economy. Covers both goods and services trade, can be used to measure the conceptual overlap (reporting template for digital trade, item 4 – see Table 2.1 in Chapter 2). Surveys are designed to ensure representative results and to delineate businesses from other institutional sectors according to the relevant statistical definitions. Information on digitally ordered trade in goods and services can be collected on the same survey.	Measurement of digitally ordered trade integrated with the measurement of e-commerce (a closely related concept). May offer more flexibility to introduce new questions than core business surveys.	Covers only transactions involving businesses. Business ICT surveys are primarily designed to collect information on technology use rather than monetary amounts. Some ICT surveys do not cover all industries and firm sizes. Results may be challenging to integrate with economic statistics coming from other sources (e.g., due to a lack of detailed product information).
"Core" business surveys		Measurement of digitally ordered trade integrated in the same surveys used for other macroeconomic statistics. May offer greater industry/firm size coverage and larger sample sizes than ICT surveys.	Covers only transactions involving businesses. Can be more difficult to add new questions than on business ICT or MNE surveys.
MNE surveys	MNEs can account for a significant portion of goods and services trade flows and, as such, are likely to underpin a considerable portion of digitally ordered trade. Information can be collected for trade in goods and in services in the same survey.		Only covers a subset of businesses – does not cover all digitally ordered trade transactions. May be challenging to exclude some transactions e.g., e-commerce sales by affiliates/subsidiaries located in the same economy as the buyer.
Household ICT surveys	Households are active in digitally ordered trade as both buyers and sellers. Covers both goods and services trade, can be used to measure the conceptual overlap (reporting template item 4). Can cover both imports and exports. Surveys are designed to ensure representative results and to delineate households from other institutional sectors according to the relevant statistical definitions – making household surveys a compatible complementary source to business surveys.		Covers only transactions involving households. Households can find it difficult to report the amounts spent or earned online, and especially to identify international transactions.
Surveys of ICT usage in government units and/or NPISHs	Government units and NPISHs can be e-commerce buyers and sellers. Covers both goods and services trade, can be used to measure the conceptual overlap (reporting template item 4). Can cover both imports and exports.		Covers only transactions involving Government units/NPISHs. Surveys of ICT use in Government and/or NPISHs are not widely implemented and have not generally been used to measure spending or income from e-commerce/digitally ordered trade.

Source	Strengths	Limitations
	Surveys are designed to ensure representative results and to delineate government units/ NPISHs from other institutional sectors according to the relevant statistical definitions – making such surveys a compatible complementary source to both surveys of businesses and households.	
Customs records	Customs records are the main data source for merchandise trade statistics; identifying digitally ordered shipments therefore has the potential to yield integrated statistics on digitally ordered trade in goods.	Goods trade only. Excludes goods below relevant customs thresholds (i.e. *de minimis* trade) and in some cases reduced information for low value trade. Estimation of these values will require drawing on complementary sources to estimate the portion of *de minimis* and low value trade relating to digitally ordered goods. Requires implementation of data fields and processes to identify digitally ordered (e-commerce) shipments in customs reporting systems.
VAT returns data	VAT returns can offer a readymade source of data on business sales revenues.	Normally sales (exports) only. Covers VAT registered businesses only. Requires methods to identify businesses selling online from within the total population of VAT returns. These may be imprecise in identifying firms that sell online e.g., by omitting businesses which sell online through channels other than their own website/webshop (e.g. via online marketplaces or EDI). Possible over-coverage - may include offline sales by businesses identified as selling online.
Card payments data	In many countries, cards are the primary means of payment used by households for online purchases; online card payment often accompanies the placement of an online order. Merchant location information can be used to identify international transactions. Card payments data can therefore provide a meaningful proxy for the bulk of household online spending and digitally ordered trade. Breakdown into goods, services, digitally delivered services may be possible based on merchant category codes.	Purchases (imports) only. Proxy measure for digital payment rather than *digital ordering*. Not all "card-not-present" transactions are digitally ordered. Only covers imports paid for by card; imports purchased by other means are excluded. Furthermore, differences in the prevalence of cards as a means of payment for digital orders can affect comparability across countries. Likely to mainly cover household transactions but may also include payments made on corporate/ business cards or payments made on personal cards for business purposes. The location information recorded in card payment data can reflect corporate structures and other distorting factors, rather than geographical reality. Product breakdown based on merchant category codes likely to be inexact. Access to data may require negotiation, payment, or legislation.

Source: IMF, OECD, UNCTAD and WTO.

Endnotes

1 An extranet is a closed network that uses internet protocols to securely share a business' information with suppliers, vendors, customers or other business partners. It can take the form of a secure extension of an Intranet that allows external users to access some parts of the business' intranet. It can also be a private part of the business' website, which business partners can access after being authenticated via a login page (UNCTAD, 2021a).

2 Electronic data interchange (EDI) is the computer-to-computer transmission of business data – such as shipping orders, purchase orders, invoices, and requests for quotations – in an electronic format using agreed standards. The messages are composed and processed without human intervention, which increases the speed of order processing and reduces errors. EDI is used in a wide variety of industries, including food, retail, logistics, and manufacturing, to manage international supply chains efficiently (e.g., just-in-time inventory management).

3 https://stats.oecd.org/Index.aspx?DataSetCode=ICT_BUS.

4 https://stats.oecd.org/Index.aspx?DataSetCode=ICT_HH2.

5 https://ec.europa.eu/eurostat/web/digital-economy-and-society/data/database.

6 https://stats.oecd.org/Index.aspx?DataSetCode=ICT_BUS.

7 https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx.

8 https://www.itu.int/en/ITU-D/Statistics/Pages/coreindicators/default.aspx.

9 https://www.itu.int/en/ITU-D/Statistics/Pages/intlcoop/partnership/default.aspx.

10 "EDI type sales: an EDI-type order message is created from the business system of the customer" (Eurostat, 2021b).

11 https://ec.europa.eu/eurostat/databrowser/view/ISOC_EC_EVALS__custom_5510498/default/table?lang=en.

12 https://ec.europa.eu/eurostat/databrowser/view/ISOC_EC_EVALN2__custom_5510351/default/table?lang=en.

13 https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&lang=en&Item_Id=1317562

14 Guidelines on household ICT surveys are set out in ITU (2020), OECD (2015b) and the EU Survey on the use of ICT in households and by individuals (https://circabc.europa.eu/ui/group/89577311-0f9b-4fc0-b8c2-2aaa7d3ccb91/library/d3c29c57-2ce2-439d-af80-b74ffd8f5b73) and its associated methodological manual (https://circabc.europa.eu/ui/group/89577311-0f9b-4fc0-b8c2-2aaa7d3ccb91/library/3e098987-039b-402a-b925-f3c9cb0c5059).

15 EDI, while crucial for business e-commerce, is not used for consumer ordering and hence is not relevant for households.

16 https://ec.europa.eu/eurostat/web/digital-economy-and-society/data/database.

17 https://www.wcoomd.org/-/media/wco/public/global/pdf/about-us/legal-instruments/resolutions/policy-commission-resolution-on-cross_border-ecommerce_en.pdf?la=en.

18 https://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/frameworks-of-standards/ecommerce.aspx.

19 https://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/activities-and-programmes/ecommerce/e-commerce-compendium_en.pdf?db=web.

20 Some countries may make a distinction between customs and statistical thresholds. In all cases, compilers are encouraged to estimate, or otherwise quantify, flows below such thresholds to ensure comprehensive coverage of merchandise trade statistics.

21 Note in this section that the estimates for "*de minimis*" referred to above may reflect the thresholds actually used by statistics agencies to estimate small-parcel trade (statistical thresholds) and not the *de jure* thresholds set by Customs authorities (customs thresholds). For example, in the United States, the *de minimis* customs threshold is actually US$ 800, one-third of the threshold used by the United States Census Bureau to estimate small parcel trade. Also, see Global Express Association for updated *de minimis* on customs and VAT at https://global-express.org/assets/files/Customs%20Committee/de-minimis/GEA%20overview%20on%20de%20minimis_9%20March%202018.pdf.

22 Countries that do not produce *de minimis* estimates often cited limitations in source data or consider these flows as insignificant.

23 The International Post Corporation E-commerce Shopper Survey found that 80 per cent of goods purchased online for international delivery in 2021 had a value of less than Euros 100, see https://www.ipc.be/services/markets-and-regulations/cross-border-shopper-survey/2021.

24 https://taxation-customs.ec.europa.eu/news/new-form-customs-declaration-low-value-consignments-2019-07-11_en.

25 https://www.census.gov/foreign-trade/guide/sec2.html#143.

26 Merchant category codes are used by the major payment card companies to identify the type of business in which a merchant is engaged. See, for instance, https://www.citibank.com/tts/solutions/commercial-cards/assets/docs/govt/Merchant-Category-Codes.pdf.

27 https://www.centralbank.ie/statistics/data-and-analysis/credit-and-debit-card-statistics.