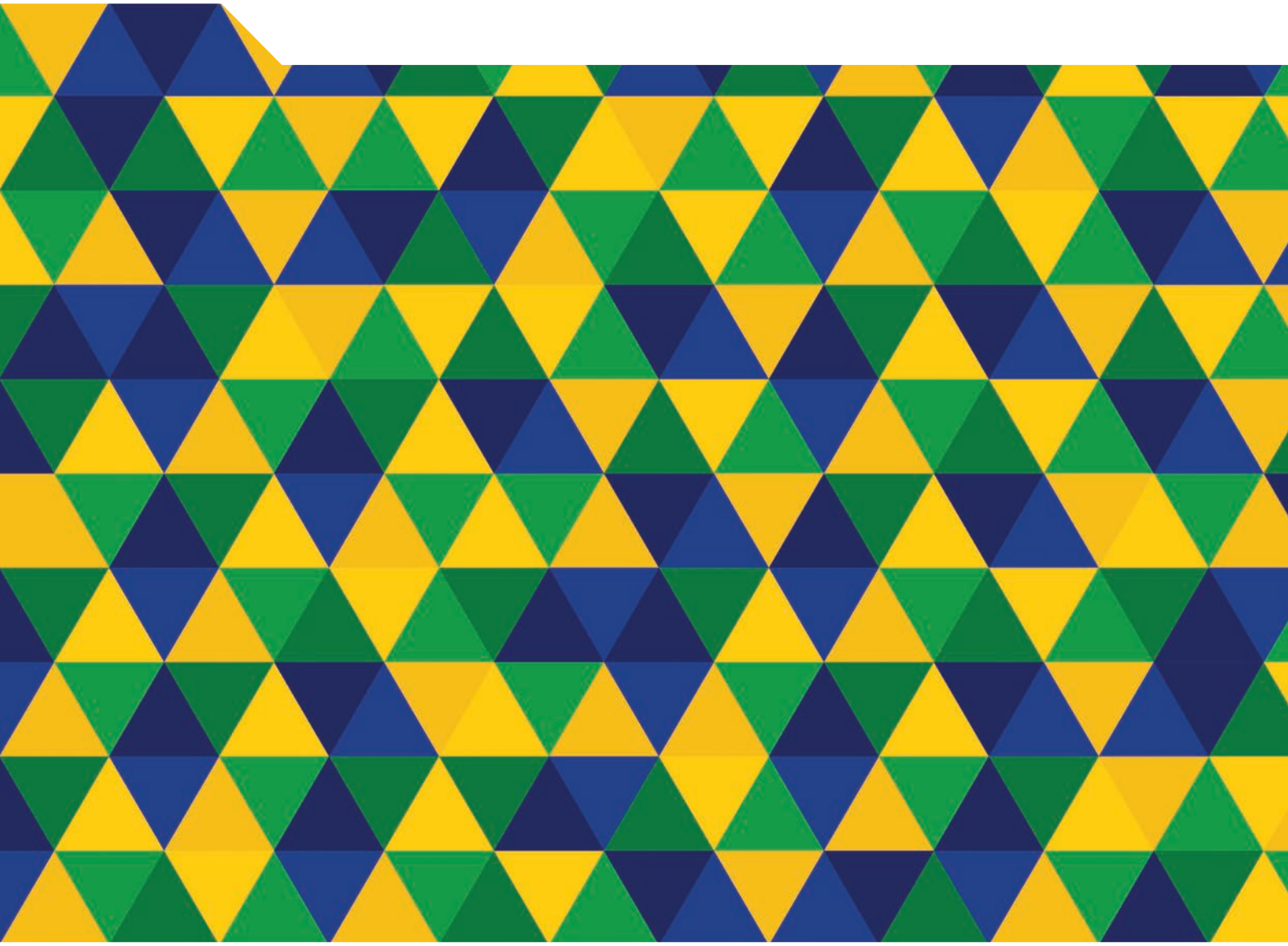
# Digital Trade Review of Brazil



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# Digital Trade Review of Brazil

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# Foreword

The *OECD Digital Trade Review* is a new series analysing the challenges and opportunities that the digital transformation raises for trade for particular countries, offering policy recommendation on how to ensure that new challenges can be met and benefits shared more inclusively.

This *Digital Trade Review of Brazil 2022* is the first of the series and is composed of five chapters. The first chapter discusses how the digital transformation is changing international trade and what this implies for Brazil. The second maps the nature and evolution of Brazil's participation in digital trade. The third investigates the possible economic impact of Brazil joining the World Trade Organisation's Information Technology Agreement. The fourth maps the evolving regulatory environment as it relates to issues of importance to digital trade, benchmarking Brazil's performance against that of other countries. The fifth and last chapter uses detailed firm level data to identify how access to ICT goods and services enables greater competitiveness for Brazilian firms and how digital restrictions affect Brazil's exports of services.

The *Review* was prepared by a team led by Javier López González and included Andrea Andrenelli, Charles Cadestin, Janos Ferencz, Irene Oliván García, Taku Nemoto, Silvia Sorescu, and Francesca Spinelli. The authors would like to thank the Government of Brazil for its support throughout, providing guidance, data and comments. In particular, we are grateful to Lucas Ferraz, Daniela Ferreira de Matos, Herlon Brandão, Paulo Felipe Alencar de Oliveira, Diego Afonso de Castro, Saulo de Souza Guerra Ferreira de Castro, Paula Costim and Cassia de Lima Pierobon from the Ministry of Economy (Secretaria de Comércio Exterior). And to Leandro Magalhaes Silva de Sousa, Gustavo Gerlach da Silva Ziemath and Cosmo Ferreira from the Ministry of Foreign affairs. The authors are also grateful to the OECD Working Party of the Trade Committee for useful guidance. Any errors or omissions are those of the authors.

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# Executive summary

The digital transformation is affecting all parts of the economy, fundamentally changing the way countries, businesses and people trade. This is largely driven by the considerable reduction in the costs of engaging in international trade enabled by digitalisation which has given consumers, and firms of all sizes, new opportunities to benefit from trade. However, in this new and evolving environment, new approaches to market openness are needed to help ensure that the benefits from the digital transformation for trade can be reaped and shared more inclusively. This is especially the case in the context of accelerating digitalisation as a result of the COVID-19 pandemic.

Brazil has embraced the digital transformation – tripling the share of its population with access to the Internet in just 15 years. With trade representing nearly a third of its GDP, Brazil has strong potential to benefit from digital trade. Against this background, this Digital Trade Review of Brazil examines the specific challenges and opportunities that the digital transformation raises for Brazilian trade, offering insights and policy recommendations on how Brazil can maximise the benefits from digitalisation for trade. The main findings are set out below.

- ICT goods and services play a critical role in enabling access to digital networks yet barriers on these products remain high. For instance, ICT goods, which comprise around 9% of Brazil's total imports, face tariffs that are 9-10 percentage points higher than world averages. At the same time, ICT services, which represented around 12% of services imports in 2020, also face significant regulatory hurdles; for instance, Brazil ranked 44th out of 48 countries in the OECD Services Trade Restrictiveness Index (STRI) for computer services in 2020.
- The higher cost of ICT goods and services may help explain why, relative to world averages, Brazil lags in the use of ICT inputs in the production of its exports. This is especially the case in agriculture, forestry and fishing, which represent a significant share of Brazilian exports (around a sixth of total gross exports) and where ICT use is associated with growing export competitiveness. The same is also true for manufacturing sectors (which represent over a third of total gross exports), where the use of ICT goods and services in Brazil is well below the average in OECD countries.
- The modelling analysis undertaken in this report suggests that Brazil's potential accession to the Information Technology Agreement would promote use of ICT goods, lead to value added gains in most sectors and contribute to export diversification. However, accession will also result in tariff revenue losses which will require identification of alternative revenue streams. Additionally, firm level econometric analysis confirms that policy-makers wishing to promote export competitiveness need to act to enable greater access to imported ICT inputs.
- Digitally deliverable services, which include ICT services, as well as business services such as financial or consultancy services, as well as audio-visual services, have grown to represent 65% of Brazil's services exports in 2020 (up from 46% in 2005). In this area, Brazil outperforms many regional partners. Firm-level econometric analysis suggests that Brazil should seek to reduce barriers to digitally enabled trade in foreign markets, including through RTAs and at the WTO, to reap benefits from its increased capacity for export penetration.

- The number of exporting firms using postal delivery (an indicator of trade in digitally ordered parcels) increased nearly six-fold, with an even higher increase in the value of this trade (nearly nine-fold) over the period 2014-2017. This trade in parcels is particularly important for smaller firms. In 2017, 89% of firms using postal deliveries in Brazil were small, representing 92% of the value of postal exports. By contrast, small firms represented 51% of firms engaged in trade by other means of delivery and only 28% of this trade by value.
- The regulatory and policy environment that underpins digital trade in Brazil has undergone important and positive changes; however, it remains more restrictive than many OECD or G20 economies across a number of areas. Some of the key remaining regulatory challenges include reducing barriers to ICT infrastructure services, such as telecommunications and broadcasting services, and promoting greater competition in order to incentivise investment in better quality communication services. Further reforms in other supporting services sectors, such as transport and logistics, could also facilitate the physical delivery of digitally ordered products.
- Brazil is increasingly active in international digital trade and e-commerce discussions, including as a participant in the ongoing discussions under the WTO Joint Statement Initiative on e-commerce. That said, Brazil has only recently begun incorporating digital trade provisions in its trade agreements. The recently concluded agreement with the European Union includes certain digital trade provisions, and agreements with Chile and Mercosur can pave the way for the more comprehensive inclusion of such provisions, already being contemplated in ongoing negotiations. It will be important that Brazil continues to pursue such provisions in the future, with a view to helping expand market access for Brazilian firms engaging in digital trade.

## Key recommendations

- Lowering tariff and non-tariff barriers to trade on ICT goods, including via seeking accession to the Information Technology Agreement so that firms and individuals can access the goods they need to take advantage of digital networks at lower cost.
- Reducing regulatory barriers to: computer services to reduce costs of access to digital networks; telecommunications and broadcasting services to promote more competition and incentivise investment in higher quality communications services; courier and transportation services to enable more trade in parcels; and commercial banking services, by implementing recent reforms undertaken by the Central Bank of Brazil to ease the establishment and operation of foreign financial institutions.
- Ensuring that the new General Data Protection Law continues to provide a balanced approach fostering regulatory certainty and trust by enabling the regulatory body to act in a manner autonomous and independent from the government.
- Increasing engagement in international discussions on digital trade, including through increased use and adoption of digital trade provisions in trade agreements to ease the restrictions faced by Brazilian exporters in growing digitally deliverable exports.
- Continue efforts to bridge digital divides within Brazil to ensure that benefits of digital trade to be shared more inclusively.

# 1 Trade, digitalisation and Brazil

This chapter identifies the challenges and opportunities that digitalisation raises for trade, including in the context of the COVID-19 recovery. It suggests that Brazil's ability to benefit from digital trade will depend on whether it can create a policy environment that is conducive to further digital adoption. This will allow Brazil to leverage digital technologies to enable i) more trade in sectors of existing comparative advantage (namely natural resource based sectors); ii) more trade in sectors that have a high digital footprint (e.g. digitally deliverable services); and iii) greater participation in regional and global value chains which, to date, remains low.

## Key messages

- Although growing digitalisation implies new opportunities for Brazil's trade, it also raises a number of new challenges requiring new and more holistic approaches to market openness.
- Brazil's ability to benefit from digital trade will depend on its ability to create a policy environment that is conducive to further digital adoption to enable:
  - more trade in sectors of existing comparative advantage (namely natural resource based sectors);
  - more trade in sectors that have a high digital footprint (e.g. digitally deliverable services); and
  - greater participation in regional and global value chains where participation remains low.

## Trade in the digital era

The digital transformation has led to unprecedented reductions in the costs of engaging in international trade, changing both how and what we trade and contributing to growing competitiveness (López González and Jouanjean, 2017[1]; WTO, 2018[2]).[1] At the same time, digitalisation has changed the scope and speed of the activities undertaken by firms; allowing value to move faster and with greater ease; providing new ecosystems for exchange; and helping firms, especially micro, small and medium-sized enterprises (MSMEs), better connect with each other, including in the context of greater supply chain integration, and with consumers across the globe.

The COVID-19 pandemic has also underscored the importance of digital technologies in enabling people to stay connected to markets, jobs and each other, including across borders. *Digital enablers* such as computers, smartphones, network equipment and telecommunications services have played a key role in alleviating the social and economic consequences of confinement and social distancing measures. They have allowed people to shop online and cushioned some of the economic impacts of health-related restrictions, enabling the digital delivery of services, remote working and teleconferencing. The benefits of digital trade were already apparent before the COVID-19 pandemic (López González and Ferencz, 2018[3])), however the crisis has accelerated the shift towards a digital economy and underscored the need for governments to enable digital trade as a means to mitigate the economic slowdown and speed up recovery. The new normal will be digital, with a higher degree of online activity across all sectors of the economy.

However, as a result of digitalisation, trade has also become more complex, and how and what measures affect trade has changed (López González and Ferencz, 2018[3])). In today's rapidly evolving digital trade environment, and in the context of enabling a speedy and robust recovery, governments are facing regulatory challenges to ensure that the opportunities and benefits from digital trade, for both consumers and for businesses, can be realised and shared more inclusively. Understanding the changes that the digital transformation brings for trade and trade policy making is key to placing Brazil in the context of this transformation.

### *What is digital trade?*

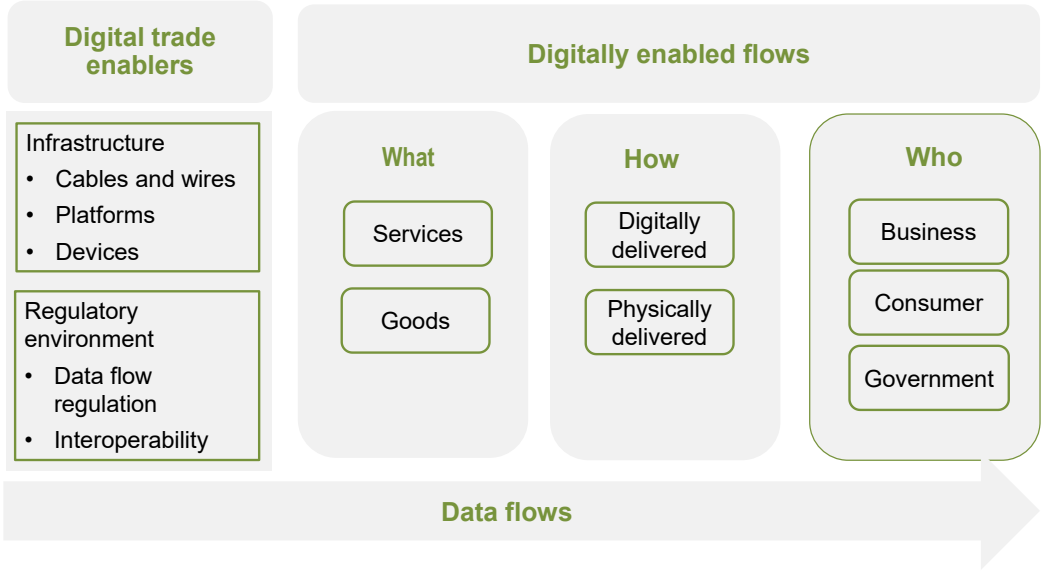
According to the OECD definition, digital trade involves digitally enabled cross-border transactions in goods and services which can be digitally or physically delivered (Figure 1.1). This includes physically delivered

goods ordered from an on-line marketplace as well as digitally delivered services. Data, and its flow across borders, underpins any and all digital trade transactions, whether as a means of production; a way for connecting supply and demand internationally; an asset that can be traded; a means through which services are delivered; or a means through which global value chains are coordinated (López González and Jouanjean, 2017[1]).

To identify how different measures might affect different forms of engagement, it is useful to break down trade transactions into their constituent elements. For instance, distinguishing between transactions that involve goods and services can be useful given that trade commitments, whether at the World Trade Organisation (WTO) or in Regional Trade Agreements (RTAs), differ along these dimensions. Moreover, with the ability to deliver services in person or remotely and, increasingly, the ability to deliver goods digitally, including through the use of 3D printing technology, the mode of delivery can also be of importance. By way of example, a book ordered through a digital platform and delivered physically at home will face a different trade policy environment than a digital delivery of an e-book to an e-reader.

A number of *digital trade enablers* will affect all digital trade transactions, albeit to different degrees. Elements of physical infrastructure, such as the cables and wires that connect devices to the Internet as well as the devices themselves will matter whether you are trading goods or services (or if you are a business, a consumer or the government). The regulatory environment in which these operate, which includes broadband policy and data flow regulation and its interoperability, will also matter to the extent to which countries can engage in digital trade. Good physical infrastructure coupled with appropriate regulations are a necessary condition for digital trade in goods and services to flourish.

### Figure 1.1. Typology of digital trade




Source: Adapted from López González and Jouanjean (2017[1]).

### *How has the digital transformation changed trade?*

Digitalisation increases the scale, scope and speed of trade. It allows firms to bring new products and services to a larger number of digitally-connected customers across the globe. It also enables firms, notably smaller ones, to use new and innovative digital tools to overcome barriers to growth, helping facilitate payments, enabling collaboration, avoiding investment in fixed assets through the use of cloud-based services, and using alternative funding mechanisms such as crowdfunding. Today, and more than ever,

digitalisation has become an indispensable tool, enabling more trade to take place and helping reduce the impact of restrictions arising from the COVID-19 pandemic. Digitalisation will also play a key role in fast-tracking recovery.

Digitalisation is also changing how we trade goods. For example, the growth of online platforms has led to a rising number of small parcels crossing international borders (López González and Sorescu, 2021[4]). This is giving rise to a variety of issues for policy-makers, including at the border, ranging from the physical management of parcel trade, through to the implications for risk management (such as in relation to counterfeit goods or biosecurity standards), and revenue implications in relation to collection of taxes and tariffs (Andrenelli and López González, 2019[5]).

At the same time, new technologies and business models are changing how services are produced and supplied, blurring already grey distinctions between goods and services and modes of delivery and introducing new combinations of goods and services. A smart fridge requires market access not only for the good, but also for the embedded service. An article produced by 3D printing may cross a border as a design service, but becomes a good at the moment of its consumption. Together, these issues pose new challenges for the way international trade and investment policy is made.

Rapid technological developments also facilitate the rise of services in international cross-border trade. Information and communication technology services form the backbone of digital trade, providing the necessary network infrastructure and underpinning the digitisation of other types of services. New technologies have also facilitated the rise of digitally enabled services that are supported by a range of new services building on data-driven innovative solutions such as cloud computing.

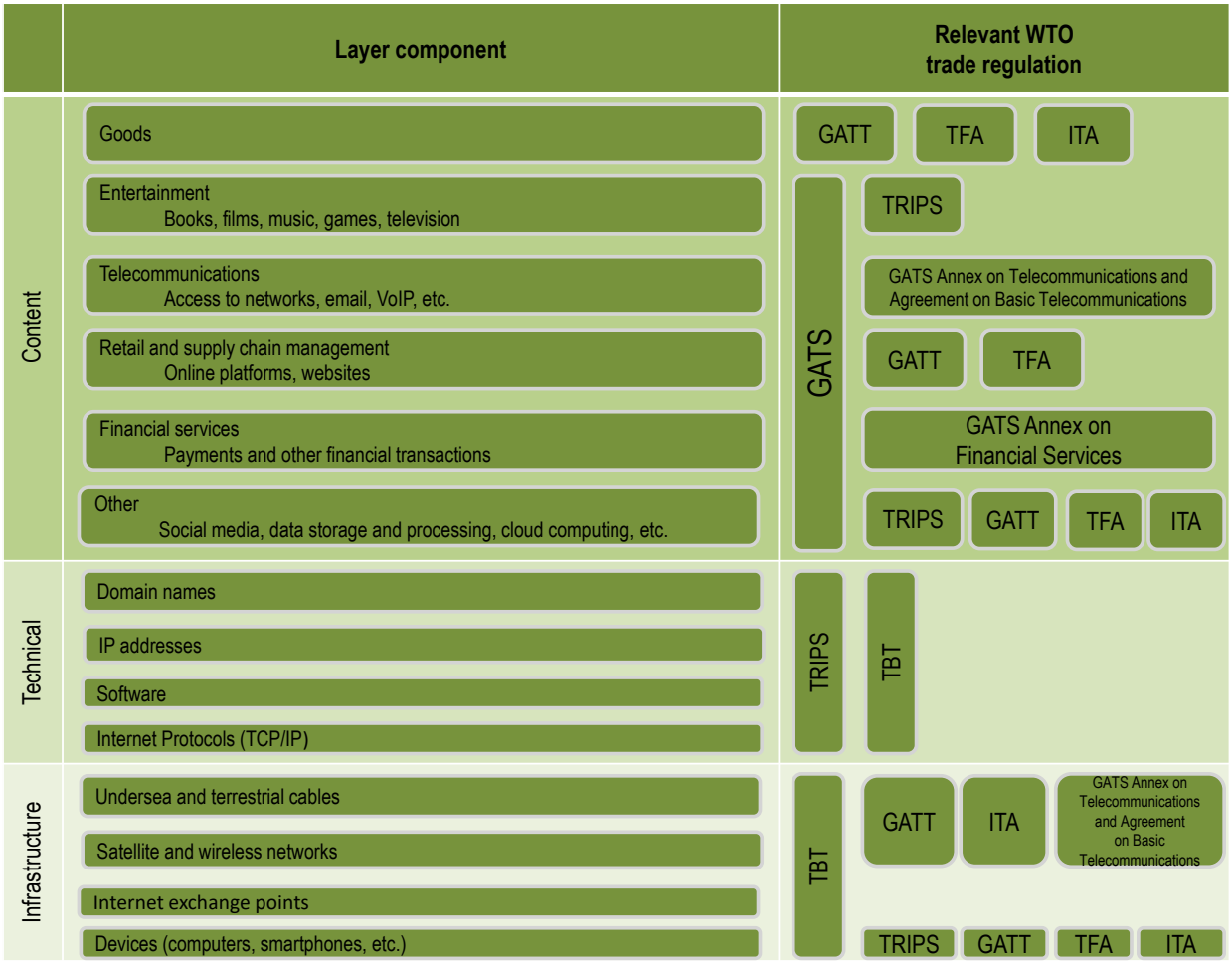
In the world of digital trade, old trade issues may have new consequences – such as the impacts of cumbersome border procedures on parcel trade, or restrictions on newly tradable services – and new issues for trade policy are emerging, such as differing regulations among nations in relation to data flows or electronic payments. Understanding the nature and extent of these changes can help policy makers create an environment that nurtures innovation and promotes digital trade in goods and services.

### *What are the key implications for trade policy?*

Against the background of rapid and far-reaching change, it is often said that the rules that underpin the digital trade environment have struggled to keep pace with changing business models. Indeed, existing multilateral trade rules were negotiated when digital trade was in its infancy, and despite being technologically neutral, questions are arising over whether they adequately address the needs of firms engaged in digital trade or if they might require clarifications to reflect new forms of, and issues raised by, digital trade.

Although WTO rules were adopted at a time when no one could have anticipated the far-reaching effects of digital technology on trade, the regulatory framework established under the WTO agreements has full bearing on digital trade. The General Agreement on Trade in Services (GATS) establishes important rules that are crucial for the digital world and in particular for digitally delivered services. At the same time, digital technologies facilitate trade in goods, especially for parcels which are ordered online which means that obligations under the General Agreement on Tariffs and Trade (GATT) and related agreements play an important role. In fact, there are many different agreements under the WTO that will have bearing on digital trade (Figure 1.2).

## Figure 1.2. WTO rules and digital trade




Source: López González and Ferencz (2018[3]).

The question is therefore not whether the rules apply, but rather *how* they apply and what gaps might exist in the multilateral rulebook. Trade rules are predicated on identifying whether products are goods or services and the borders they cross, but new business models and the global nature of the Internet blur these distinctions. Today, firms can flexibly service markets from different locations, and their products bundle goods and services (for example, a smart home speaker connected to a voice-controlled digital personal assistant), making it increasingly difficult to identify the particular trade rules that apply to specific transactions.

This means that the nature of the measures that affect digital trade is changing. Measures that affect access to and use of digital networks have become more important. Likewise, in the digital era, as foreshadowed earlier, there are new consequences from some traditional trade issues (such as trade facilitation and *de minimis* thresholds in the context of growing parcel trade); and there are new issues that are emerging for trade (e.g. related to the movement of data or the interoperability of e-payment systems).

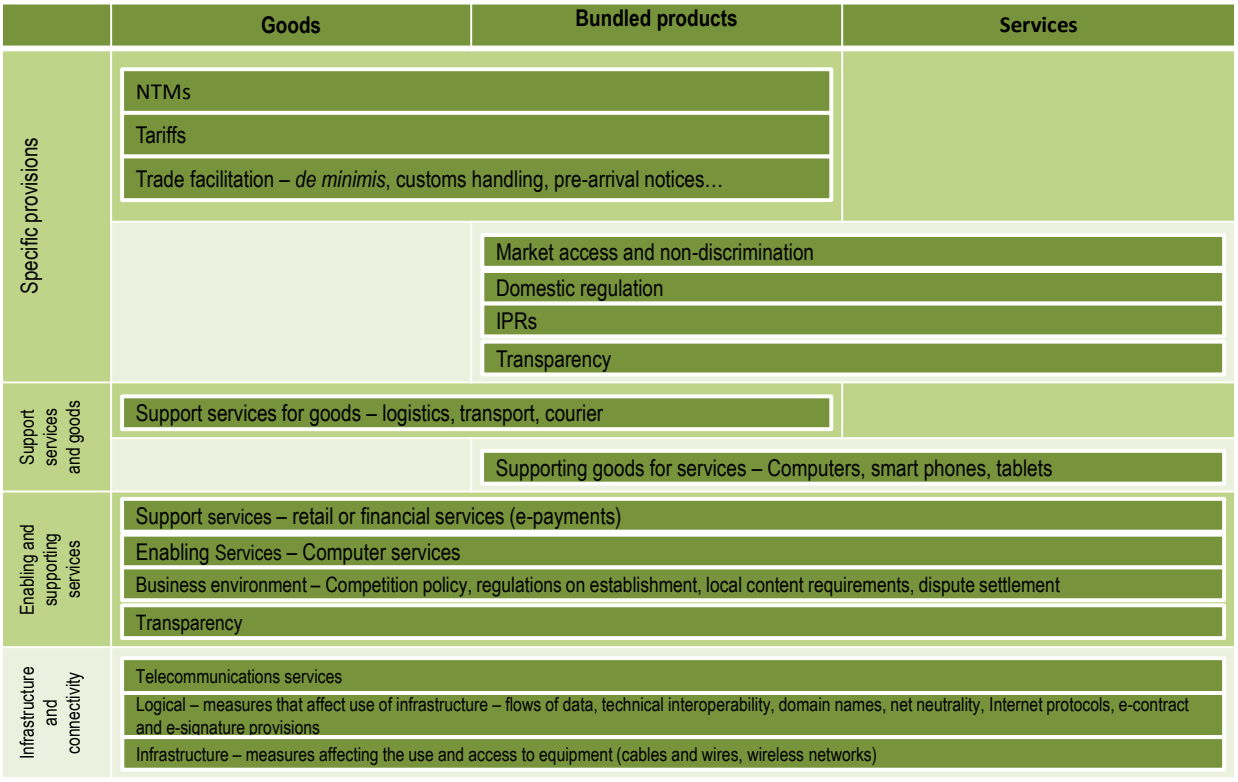
Today, trade is more complex, and a simple digital trade transaction rests on a series of enabling or supporting factors. For instance, ordering an e-book depends on access to a retailer's website. This in turn depends on the regulatory environment setting the conditions under which the retailer establishes the webpage and the cost for the consumer of Internet access – a cost which, in turn, is affected by the regulatory environment in the telecommunications sector. Lastly, purchase of the e-book will also be

affected by the ability to pay electronically and the tariff and non-tariff barriers faced by the physical device used to read the e-book.

A barrier on one of these transactions will affect the need or ability to undertake the other transactions. This means that market openness needs to be approached more holistically, taking into consideration the full range of measures that affect any particular transaction. For instance, Internet access may be a necessary but not sufficient condition for digitally enabled trade in goods to flourish. If logistics services in the receiving (or delivering) country are costly due to service trade restrictions, or if goods are held up at the border by cumbersome procedures, then the benefits of digital trade may not materialise.

The measures that affect digital trade can be articulated under a common framework, broken down by layer and across goods, services and bundled products (Figure 1.3). At the core of any and all digital trade transactions, whether involving goods, services or bundled goods with services, lies the "infrastructure and connectivity" layer, composed of the physical infrastructure and the regulations that underpin digital networks. There is also a transversal layer related to "enabling and supporting services" which captures access to key enabling services such as computer services. The remaining layers capture measures that are specific to the products being traded, including market access but also supporting goods and services.

## Figure 1.3. Measures affecting digital trade




Source: López González and Ferencz (2018[3]).

This means that, in the digital age, a more holistic approach to market openness is needed. One that takes into consideration the different factors that enable digital trade transactions across issues related to both goods and services. At the same time, a holistic approach to market openness also means going beyond the issues that traditionally concern trade policy makers. It is also about understanding how market openness interacts with other policy domains such as innovation, infrastructure, connectivity and skills. Indeed, market openness is a necessary but not sufficient condition for digital trade. New technologies are

often made available through international trade, and access to global markets for both inputs and outputs is necessary for scaling production and increasing competitiveness. But taking advantage of new opportunities is only possible for firms with the skills and capacity to adopt new data-driven solutions. Successful firms in the digital age combine adoption of new technologies with access to global markets, so trade policy needs to be seen in the context of a range of other policies which also matter for the shared benefits from digital adoption to materialise.

### *How can digital trade be leveraged to fight the implications of COVID-19?*

Digital trade and related policies also have the potential to help tackle some of the issues arising from the COVID-19 crisis. For example, by enabling activities to move online, digital technologies may help reduce physical exposure to the virus. Digital technologies can also be leveraged to expedite the movement of goods across borders and to enable the delivery of services, both of which are critical to maintaining economic activity and promoting a speedy recovery across a range of sectors.

In this respect, six priority areas might be especially important (OECD, 2020[6]).

- *Promoting affordable access to digital networks*: The ability to telework, shop online and to maintain remote social contact depends on access to affordable and reliable digital networks. Trade policy has a role to play in enabling access to more competitively priced ICT services (telecoms and computer and related services) and goods (network equipment such as cables, wires and hardware) that form the backbone of broadband networks and support growing bandwidth needs and use.
- *Enabling access to the devices through which we access the internet*. Laptops, printers, monitors, storage units and other computer accessories are the gateways through which we access the internet. The production of these devices involves complex and internationalised value chains: on average, 80% of the value added of computer and related equipment is foreign – making this one of the most internationalised sectors. Reducing tariff and non-tariff barriers to these devices will help countries better avail themselves of the goods they need to go online.
- *Promoting cross-border trade in digitally ordered parcels*. Online shopping has accelerated as a result of COVID-19. Many of the products ordered online are shipped across borders in individual consignments, this is known as parcel trade. This trade has helped consumers access the goods they need in times of confinement and also allowed firms, especially smaller ones, to maintain economic activity. Compared to 'traditional' container trade, parcel trade involves an even more complex network of interlinked actors and policies, and so ensuring that parcels get to where they are needed requires policy action across a diverse set of issues which include, issues to the border, at the border and beyond the border (see also OECD (2020[7]) and López González and Sorescu (2021[4])).
- *Enabling more efficient movement of goods across borders by adopting digital technologies at the border*. Digital technologies can ensure that border processes are transparent and accessible to traders; that formalities can be expedited; and that processes at the border require less physical contact. This is particularly important for the micro- and small- and medium-sized enterprises (MSMEs) which are hardest hit by the crisis.
- *Facilitating the digital delivery of services across borders*. Access to telecommunications networks, cloud processing and digital communication is helping businesses maintain key operations and communicate with employees and clients, while adhering to physical distancing requirements. However, barriers that affect digitally enabled services have been growing in recent years (Ferencz, 2019[8]). Lowering digital services restrictions could help to enable more digital trade in both goods and services.
- *Bridging the digital divide*. The crisis has also underscored the need to address existing digital divides to facilitate activities under mobility restrictions and ensure that the gains from digitalisation

can be realised and more widely shared across countries and societies. This is especially important in enabling an inclusive recovery.

### Box 1.1. Enabling more efficient movement of goods across borders during COVID-19

Disruptions experienced in the transport and logistics that move goods to and beyond the border have led to shortages in sea, air and road cargo capacity, impacting trade routes worldwide. Additionally, to limit the spread of the virus, many governments have put in place measures such as channelling traffic through fewer border crossings; introducing new protocols at borders, including by conducting at-the-border health checks; or, in some cases, reintroducing border controls that had previously been removed. These measures place additional demands on border agencies that are also wrestling with how to efficiently carry out their functions while implementing containment measures such as social distancing (OECD, 2020[9]).

The smooth operation of logistics chains in the midst of the COVID-19 outbreak depends on reconciling the fast and efficient movement of goods with increased control measures, temporary disruptions to staffing, and restrictions on human contact. Digitalisation can play an important role by enabling more efficient trade facilitation, in particular for ensuring the swift movement of essential medical and food supplies. Digital technologies can be leveraged to ensure that formalities are transparent and accessible to traders; that they can be expedited; and that processes at the border require less physical contact. This is particularly important for micro-, small- and medium-sized enterprises (MSMEs) which are hardest hit by the crisis.

Many mechanisms limiting physical interaction – such as electronically lodging documents in advance, electronic payment of trade-related taxes, digital certificates and signatures, or 24/7 automated processing of trade declarations – are already available in regions such as Europe and Central Asia, North America, Asia-Pacific, and Latin America and the Caribbean (OECD, 2020[7]). However, countries in the Middle East and North Africa and Sub-Saharan African regions have faced more challenges in introducing such measures. With lower availability of personnel due to confinement and social distancing measures, agencies need to make full use of their interconnected or shared computer systems and real-time availability to share relevant data among themselves to facilitate cross-border data exchange or clearing of export and import declarations electronically. Given the differences in capacities among countries, and the global nature of the crisis, enhanced international co-operation in risk management is key at this stage, for example through the sharing of inspection and control results among border agencies.

Source: OECD (2020[6]).

## The evolving policy context

### *International discussions on digital trade are picking up*

Against this backdrop, trade policy is also evolving. Multilateral discussions on digital trade began as early as 1998 with the introduction of the work programme on e-commerce launched by the WTO (1998[10]). That same year, WTO members agreed on a Moratorium on applying customs duties on electronic transmissions, which has been regularly extended (most recently at the General Council Meeting in December 2019 where it was extended till the next Ministerial Conference). However, progress on digital trade-related issues has been slow until January 2019 when a group of WTO members agreed to "initiate exploratory work together toward future WTO negotiations on trade-related aspects of electronic commerce" (WTO, 2019[11]). As of January 2022, this Joint Statement Initiative (JSI) comprises

86 members, including Brazil, touching on a range of issues which include facilitating electronic transactions through discussions on e-signatures and e-payments as well as issues such as information flows, privacy, consumer protection, cybersecurity and market access (Table 1.1).

### Table 1.1. Joint Statement Initiative – areas of discussion

| |
|---|
| 1. Enabling Digital Trade/E-commerce |
| • Facilitating electronic transactions (electronic transaction frameworks, e-authentication and e-signatures etc.) |
| • Digital trade facilitation and logistics (paperless trading, customs procedures, de minimis, single windows data exchange and system interoperability, logistics services, enhanced trade facilitation etc.) |
| • Customs duties on electronic transmissions |
| 2. Openness and Digital Trade/E-commerce |
| • Flow of information (cross-border transfer of information, location of computing facilities, location of financial computing facilities) |
| • Access to internet and data (open government data, access to the internet, etc.). |
| • Non-discrimination and liability |
| 3. Trust and Digital Trade/E-commerce |
| • Consumer protection (online consumer protection, unsolicited commercial electronic messages/spam) |
| • Privacy (protection of personal information/privacy) |
| • Business trust (source code, ICT products that use cryptography) |
| 4. Cross-cutting Issues |
| • Transparency, domestic regulation, and cooperation |
| • Cyber-security |
| • Capacity building, technical assistance and legal issues |
| 5. Telecommunications |
| • Updating the telecommunications reference paper |
| • Electronic commerce-related network equipment and products |
| 6. Market access |
| • Goods market access |
| • Services market access |

Source: Author's compilation.

However, these multilateral discussions are only just getting started which is why progress on governance of digital trade-related issues has largely taken place in the context of bilateral and regional trade agreements (RTAs). Indeed, according to calculations made using the TAPED database which maps digital trade provisions in trade agreements (Burri and Polanco, 2020[12]), 113 RTAs, representing 34% of all RTAs notified to the WTO, include specific provisions on digital trade.[2] Most of these, close to two-thirds, have arisen between 2014 and 2016 covering issues from customs duties on electronic transmissions to domestic regulation, electronic authentication, data protection and paperless trade.

### *Brazil is already actively engaged in these discussions*

By virtue of Brazil's WTO membership, many issues that will matter for the governance of Brazil's digital trade will fall within the purview of existing agreements. For instance, the GATT and GATS will cover digitally ordered or delivered trade in goods and services. Moreover, agreements such as the Trade Facilitation Agreement will cover issues that matter for cross-border trade in digitally ordered goods. Brazil is also pursuing deeper discussions on e-commerce related issues through its active participation to the WTO Joint Statement Initiative discussions. This includes proposals on issues such as e-contracts, e-authentication, paperless trading, consumer protection, data flows, privacy protection and others.[3]

Recently, Brazil has also begun incorporating digital trade provisions in its trade agreements as is the case with Chile. In June 2019, Mercosur and the European Union reached a political agreement for a comprehensive trade agreement (EU-Mercosur Association Agreement), which covers issues related to e-commerce as well. Moreover, in April 2021 MERCOSUR concluded negotiations on the MERCOSUR

Agreement on Electronic Commerce which touches on issues such as customs duties on electronic transmissions, e-signatures, e-authentication, personal data protection and cross-border data flows, and spam.

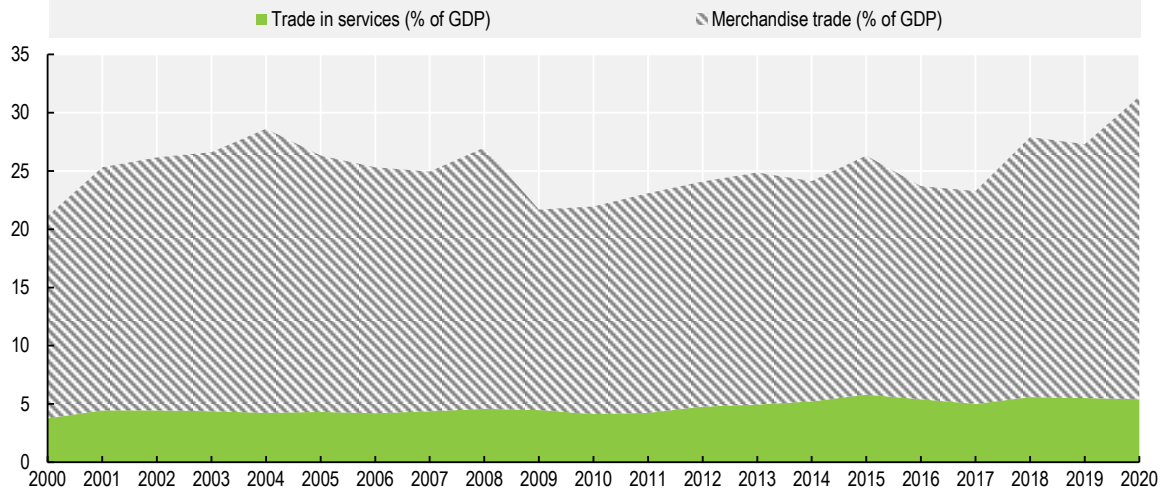
## Trade is an important share of Brazil's economic activity

Digitalisation can impact trade in different ways. It can enable more trade in more complex goods and services, and, at the same time, it can also facilitate trade across more traditional sectors (López González and Ferencz, 2018[3]). Understanding how trade has evolved in Brazil is key to identifying the potential impact that digitalisation has had or can have on Brazilian trade.

Trade is an important share of Brazil's GDP – merchandise trade represents around 26% of GDP and services trade occupies a smaller 5.4% of GDP in 2020 (Figure 1.4). The relatively stable share of trade in GDP masks considerable growth in merchandise exports which have outpaced world exports (despite sharp declines between 2011 and 2016). However, Brazilian imports have only just about kept pace with world import growth, also despite large decreases between 2014 and 2016 (Figure 1.5). Overall, Brazil imported around USD 140.6 billion and exported USD 190.8 billion of goods, running a trade surplus of around USD 50 billion in 2018. In services, Brazil imported USD 68 billion worth of services and exported around USD 35 billion, running a trade deficit of about USD 33 billion.

### Figure 1.4. Trade is an important share of Brazil's GDP

Share of goods and services (% of GDP)




Source: Adapted from World Development Indicators.

## Figure 1.5. Merchandise exports have outpaced world exports


Note: Export and import value indices are calculated using the current value of exports (f.o.b.) converted to USD and expressed as a percentage of the average for the base period (2000). Data for WLD not available for 2019 onwards.
Source: Adapted from World Development Indicators.

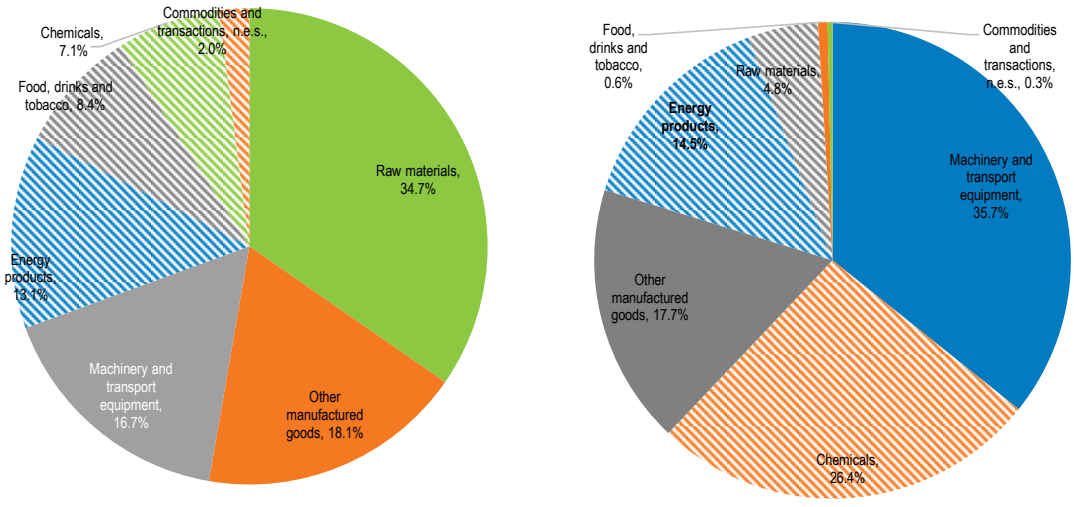
### *Brazil's trade in goods is largely natural resource based*

Brazil's merchandise exports are largely natural resource based – raw materials and agro-food products represent nearly half of total exports by value in 2019. By contrast, imports concentrate in the machinery and transport equipment and the chemicals sectors (Figure 1.6). At the product level, Brazil's exports have become more concentrated while its imports have become more diversified and at the country level exports and imports have become more concentrated. This means that, today, Brazil exports fewer products to fewer destinations and imports more products from fewer destinations than ten years ago (Figure 1.7).

At the product level, soya beans were Brazil's top export in 2019 accounting for about 11% of total exports (around USD 33 billion). Five of the other top ten merchandise exports are also agricultural goods (including also maize, bovine and chicken meat and coffee), the rest are raw materials (iron ores, wood and petroleum). This suggests that part of the impact of digitalisation on Brazil's exports is going to depend on the extent to which Brazil can leverage digital technologies to enable these sectors of comparative advantage to grow. Brazil's import basket is, by contrast, much more diversified, including petroleum oil as well as a semiconductors, pharmaceutical products, chemicals, industrial parts and motor vehicles and telephony apparatus (Figure 1.8).

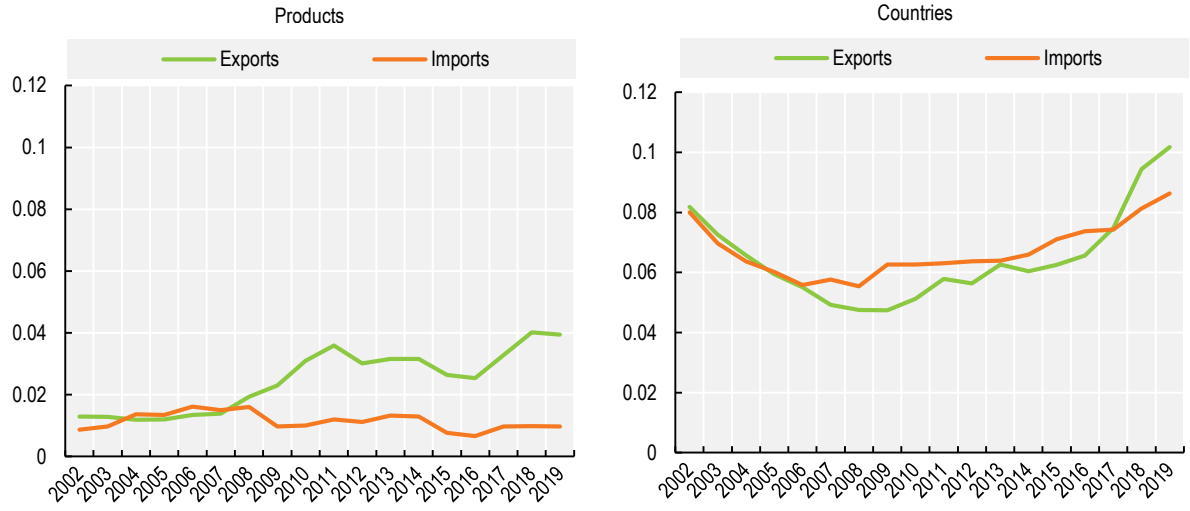
## Figure 1.6. Merchandise exports are largely natural resource based

Export and imports of goods by broad categories, 2019




Source: Own calculations from BACI.Broad product categories obtained through a correspondence with the SITC3 nomenclature at the one-digit level. 'N.e.s.' stands for not elsewhere classified.

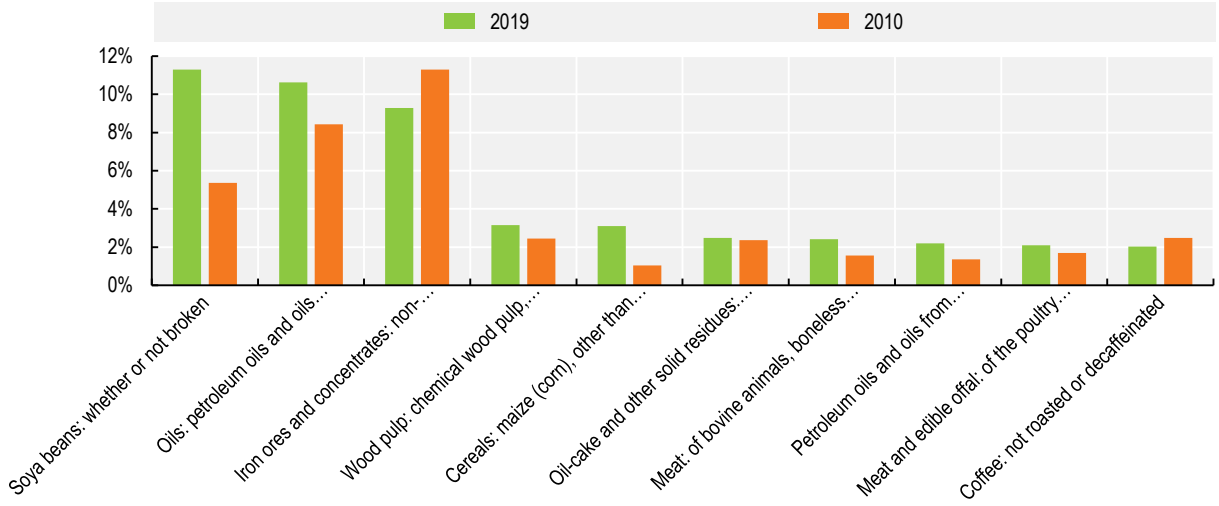
## Figure 1.7. Brazil's exports have become more concentrated, while its imports have become more diversified



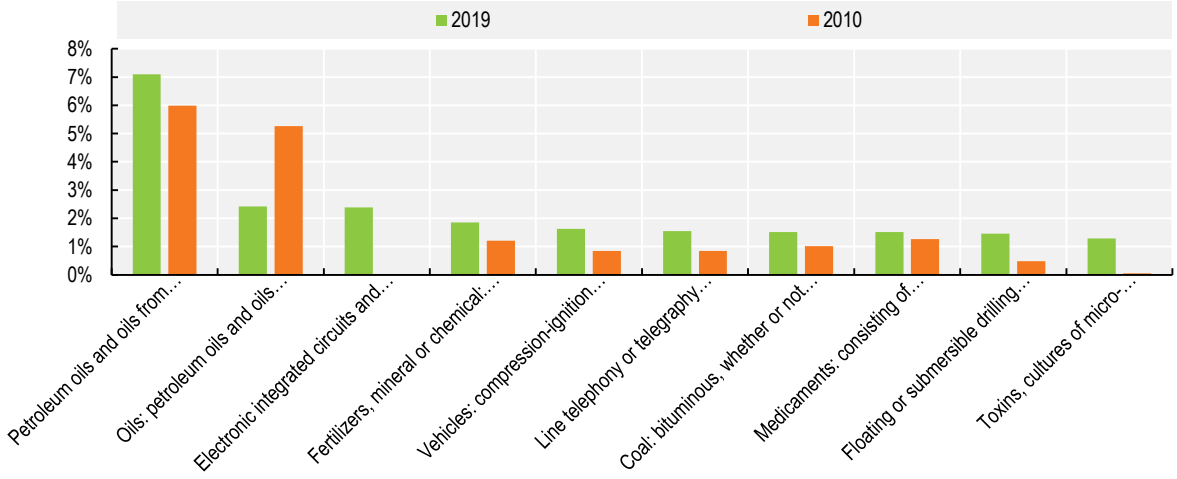

Note: Trade concentration is calculated using a Herfindhal indicator.
Source: Own calculations from BACI.

## Figure 1.8 Soya beans, petroleum and other agricultural goods are Brazil's top exports, imports are more diversified

a. Share of top ten exported goods in 2019 and 2010




b. Share of top ten imported goods in 2019 and 2010

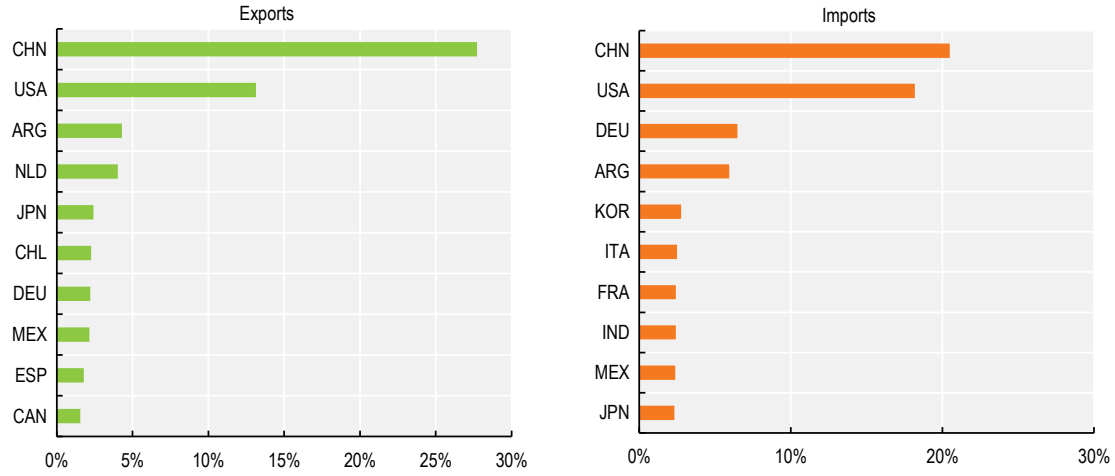



Note: Abbreviations used for HS2002 nomenclature headings.
Source: OECD based on BACI database (CEPII).

Brazil's main trade partners are the People's Republic of China (hereafter "China") and the United States, which together account for about 40% of the total value of goods exports and 38% of the total value of imports (Figure 1.9). Other key trading partners include Argentina and some EU countries. For both exports and imports, OECD countries are important trading partners.

## Figure 1.9. China and the United States were Brazil's largest goods trading partners in 2019

Shares of total exports and imports




Source: OECD based on BACI database (CEPII).

### *A large share of Brazil's services trade is digitally deliverable*

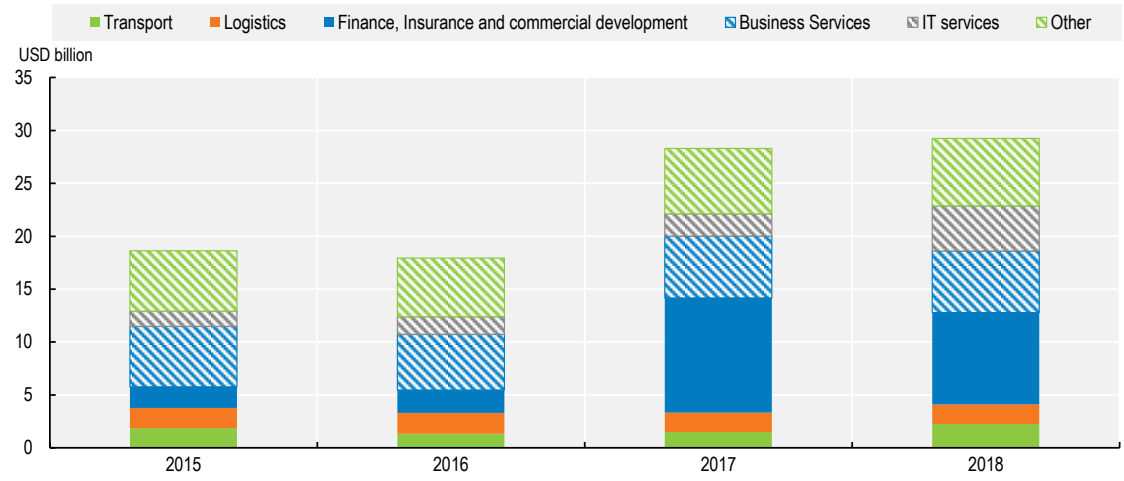
Where services trade is concerned (Figure 1.10), finance, insurance and commercial development as well as business services are top export sectors for Brazilian firms, accounting for about 50% of the value of sales abroad in 2018. IT services (NBS heading 115) also occupy an important share of overall sales with values growing to USD 4.3 billion in 2018 (around 14% of total services exports). In terms of services imports, IP-related services accounted for USD 20.7 billion, or about 47% of total imports. IT services are also an important and growing share of firms' purchases from abroad, amounting to USD 2.7 billion in 2018. In turn, imports of telecommunication services were the sixth most imported service (registered in the 'Other' category in the figure below), accounting for about USD 980 million in 2018. These figures underscore the importance of digitally deliverable services in both the imports and exports of Brazilian firms.

Relative to other countries in the region, a higher share of Brazil's exports and imports are in business services and, to a lesser extent, telecommunications services (Figure 1.11). More granular data shows that this largely involves exports of technical and professional services, consulting services and engineering services, and imports of technical and professional services, advertisement services and consulting services.[4]

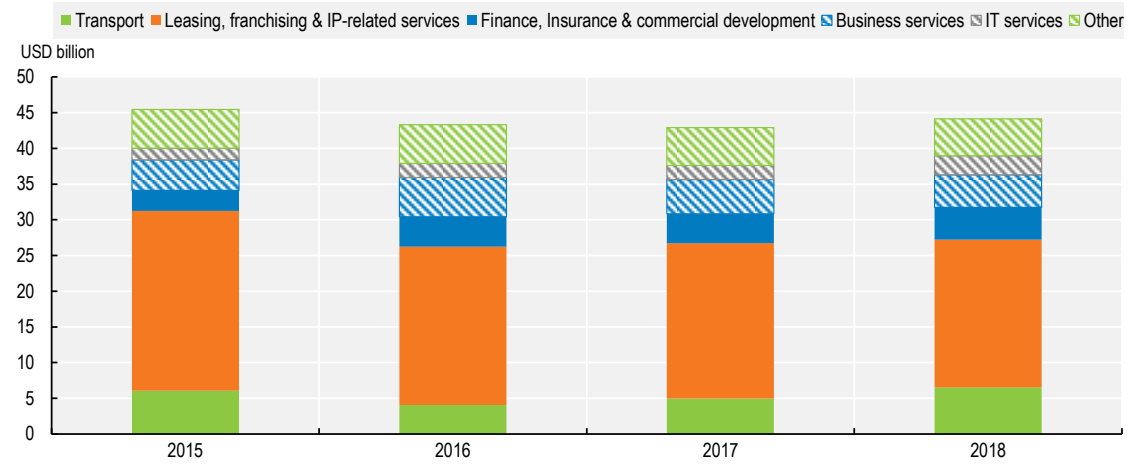
According to firm-level data, the main trade partners for services trade differ from those for goods trade. Although the United States remains an important source and destination for services exports, The People's Republic of China (hereafter "China") is not. EU countries and neighbouring Latin American countries appear to be important partners of Brazil in trade in services for both exports and imports (Figure 1.12).

## Figure 1.10. A large share of Brazil's services trade is digitally deliverable

a. Exports



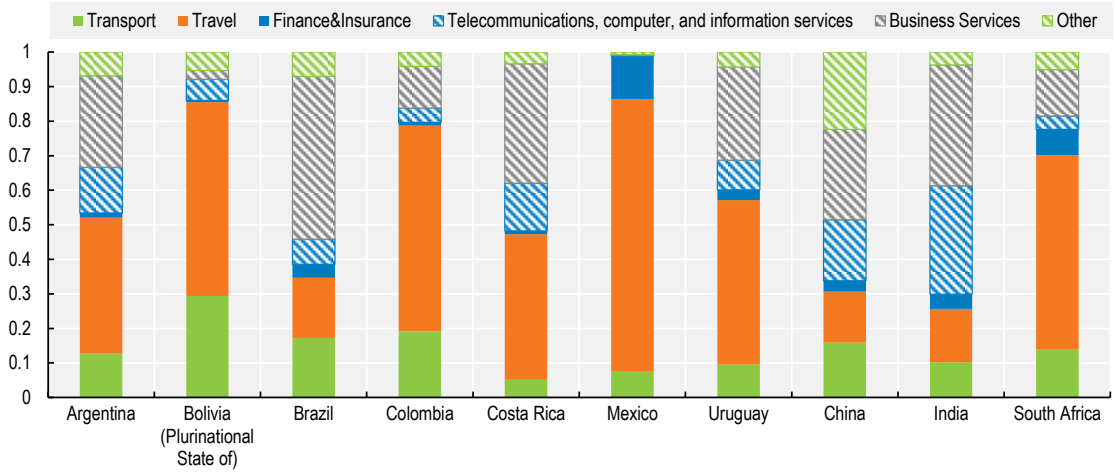

b. Imports



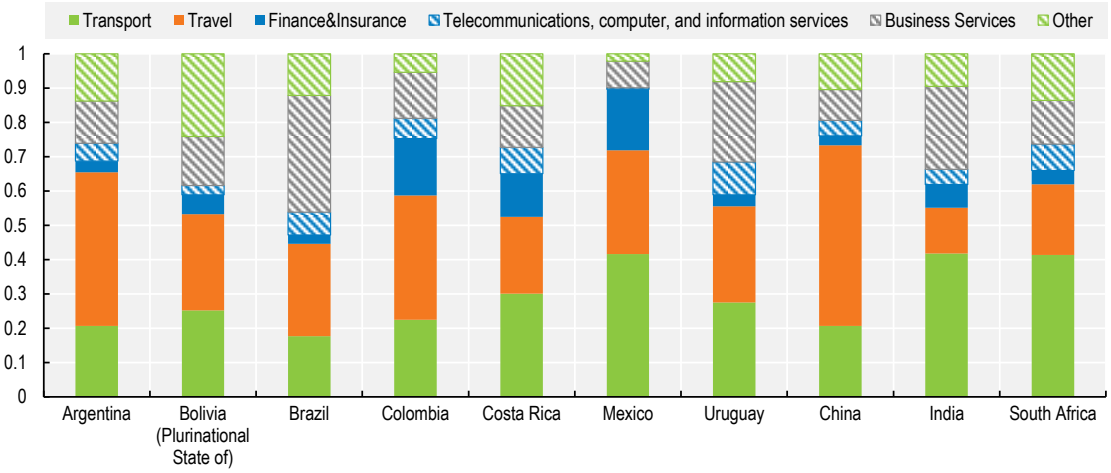

Note: * Excludes 'sigilo consolidado' (confidential). Differences with previous figure (e.g. importance of finance & insurance in exports) are likely to be explained by different data sources (Balance of Payments vs. firms reporting).
Source: OECD using SISCOSERV.

## Figure 1.11. Brazil is more specialised in exporting and importing business services than other Latin American countries

a. Exports

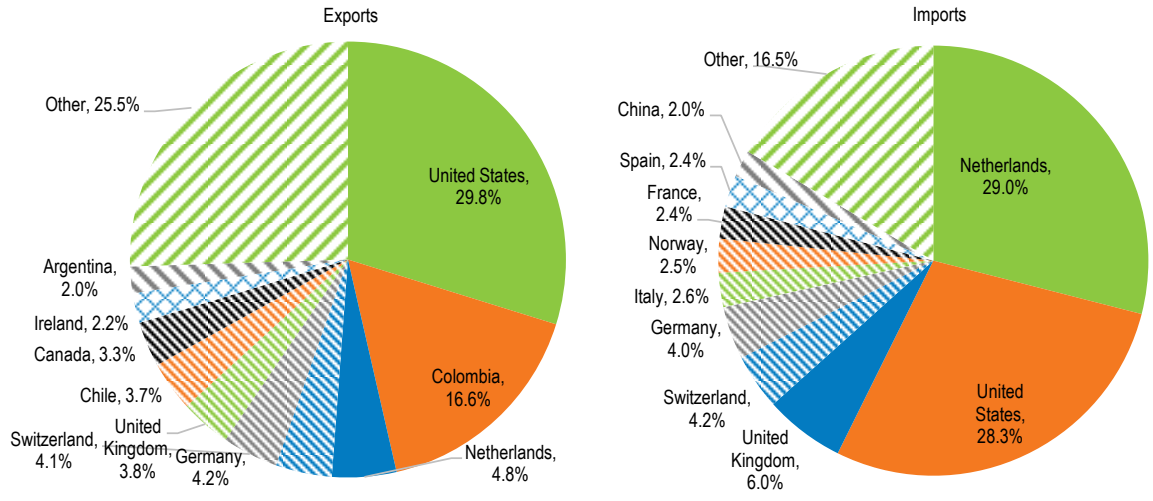



b. Imports




Note: The figure shows the individual shares with respect to total exports and imports, with the total equal to 1. 'Other' includes: Goods-related services (manufacturing of foreign inputs or repair and maintenance); Government goods and services; Personal and recreational services; Construction services; Charges for use of Intellectual Property. Data on Construction services is missing for Mexico.
Source: UNCTADSTAT Balance of Payments statistics, EBOPS classification, year 2018.

## Figure 1.12. The United States, the European Union and other Latin American countries are the largest services trading partners for Brazil




Source: OECD using SISCOSERV, year 2018.

### *Brazil is an active participant in GVCs although mainly as a seller*

Global value chains (GVCs) are a key driver of economic activity and employment (seeOECD (2013[13]), Kowalski e al. (2015[14]), López-González (2016[15]), and World Bank Group (2020[16])), including for SMEs (see López-González et al. (2019[17]). Digitalisation plays an important role in enabling internationally fragmented modes of production, allowing tasks to be codified and processes to be coordinated remotely.

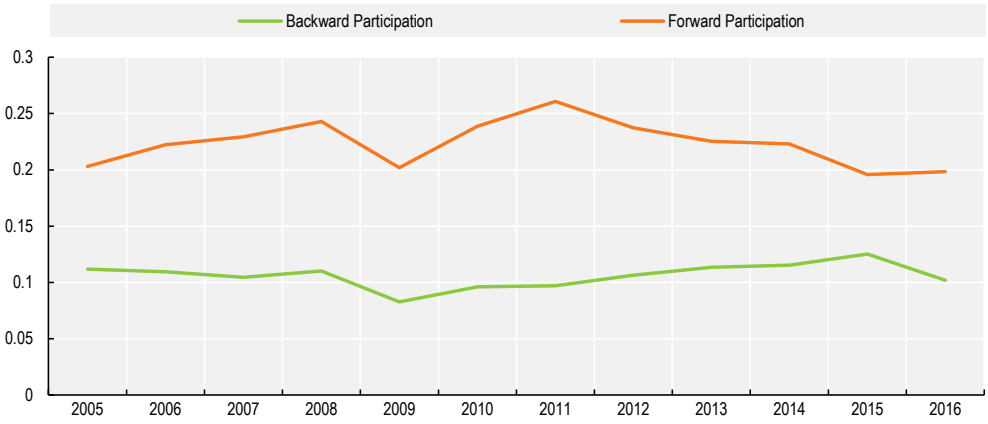
Brazil is an active and important participant in both regional and global value chains (GVCs) positioning itself, as is the case of many natural resource producers in the region, as a supplier of value added to the production of other countries' exports (forward participation) (Figure 1.13).[5]

Over 40% of the value added in Brazil's total exports comes from three sectors: food and beverages, agriculture and mining. However, where sales into international value chains are concerned (forward participation), mining is the most prominent sector representing 19% of total sales with wholesale and retail services and other business sector services representing around 30% (Figure 1.15). This suggests that, while Brazil has a strong specialisation in finished agricultural and agri-food products, its integration into global value chains is strongly driven by its supply of mining products and other services.

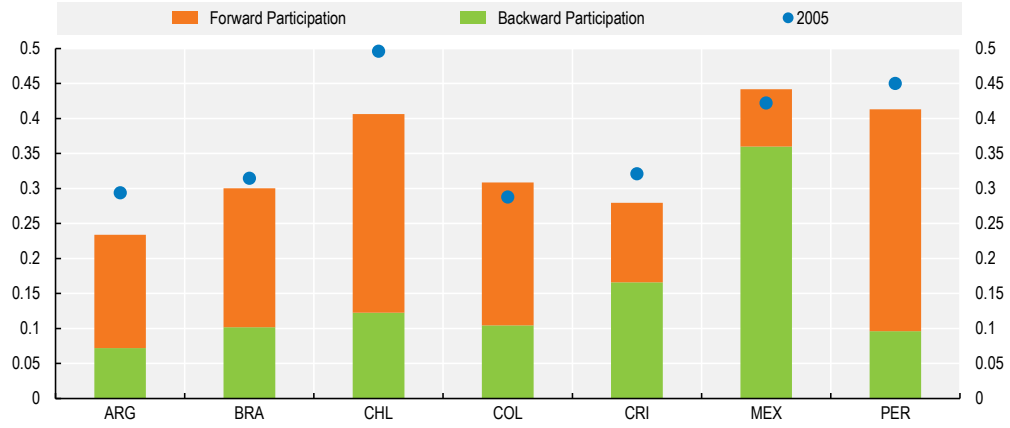
Relative to the rest of the world, Brazil appears to have a lower than average import content of exports across all sectors except mining. The degree of backward participation is especially low in areas of importance for digital trade including IT services as well as computer, electronic and optical products. This suggest that Brazil might not be fully benefiting from the potential that GVCs have to offer on the input side. Where sales into GVCs are concerned, Brazil exhibits higher than average sales across a range of service sectors, including those related to food services, but also IT and telecoms.

## Figure 1.13. Brazil is a strong seller of value added into the exports of other countries

a. Evolution of Brazil's backward and forward participation




b. GVC participation in in Latin America, 2016

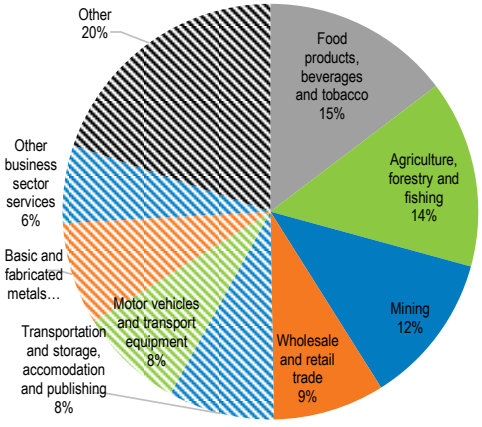



Note: Backward participation is the share of foreign value added in gross exports. Forward participation is the share of domestic value added that other countries use to produce exports as a share of own gross exports. 2005 represents the sum of backward and forward participation for the year 2005.
Source: Own calculations from OECD Inter-Country-Input-Output table 2018 revision.

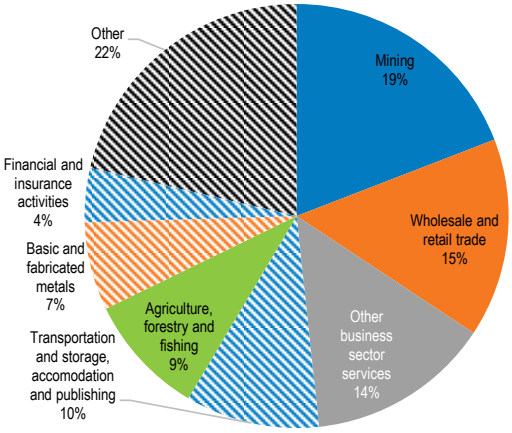
## Figure 1.14. Most of the value added in Brazil's exports is from agriculture, food and mining

Share of total exports and imports

a. Domestic value added in exports



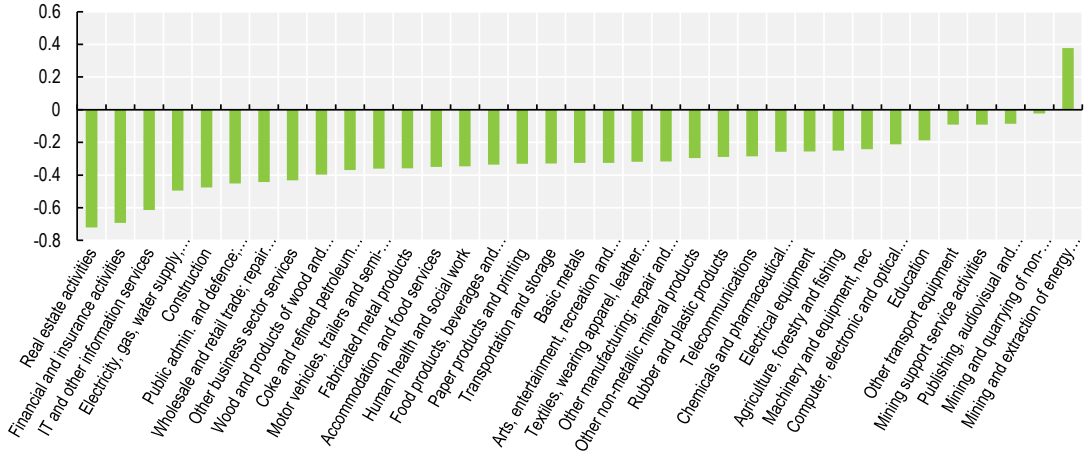

b. Domestic value added in exports of other countries (forward)



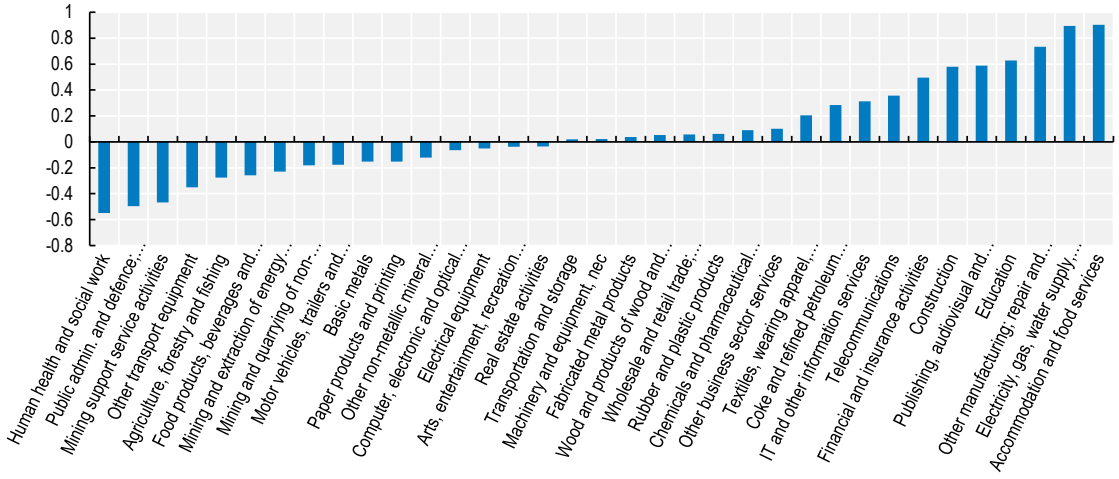

Source: Own calculations from OECD TiVA ICIO 2018.

## Figure 1.15. Brazil has a low import content of exports, but has strong service sales into GVCs

a. Brazil's import content of exports (backward participation) relative to the rest of the world




b. Brazil's domestic value added in other country exports (forward participation) relative to the rest of the world




Note: Panel a. shows Brazil's backward participation rate divided by that of the rest of the world. Panel b. shows the same but for forward participation. Values are for 2016.
Source: Own calculations from OECD TiVA ICIO 2018.

## What does this tell us about the potential for digital trade in Brazil?

The digital transformation is changing the "what" and the "how" of international trade. Understanding the nature and evolution of these changes is key to making the most out of the new opportunities on offer and facing forthcoming challenges. Many of the issues that digitalisation raises for Brazil's trade are not new, but they can have new implications. For instance, as more trade is delivered across borders via parcels ordered online, issues such as *de minimis* can take on greater importance. At the same time, new issues are raising new challenges. Data flows underpin all digital trade transactions and so, as countries adopt different data related policies, new challenges arise.

Digitalisation further blurs distinctions between goods and services. Increasingly goods trade underpins services delivery as we consume more digitally deliverable services on 'smart' physical devices (reading a book on an e-reader). At the same time, digitally enabled services enable more trade in goods with firms

using digital solutions to increase productivity and find new customers. This means that, in the digital age, trade policy needs to look at elements across both goods and services more jointly.

In addition, realising the benefits of trade in the digital era also means thinking about the interactions between trade policy and other policy domains such as innovation, infrastructure, connectivity and skills. Indeed, a combination of market openness and policies that support greater adoption of digital technologies, that promote skills upgrading and that enable access and use of digital infrastructures are needed to ensure that benefits can be attained and shared more inclusively.

Since trade is an important share of Brazil's GDP, promoting further digitalisation has the potential to enable Brazil to draw new benefits from trade. However, these will be contingent on the ability to create a policy environment which is conducive to greater digital adoption so that Brazil can leverage digital technologies to enable: i) more trade in sectors of existing comparative advantage, namely natural resource based sectors; ii) more trade in sectors that have a high digital footprint, as might be digitally deliverable services; and iii) greater participation in regional and global value chains where Brazil has a low level of participation.

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## Notes

[1] Digital transformation refers to the economic and societal effects of digitisation and digitalisation. Digitisation is the conversion of analogue data and processes into a machine-readable format. Digitalisation is the use of digital technologies and data as well as interconnection that results in new or changes to existing activities.

[2] However, it is worth noting that these vary widely in terms of issues covered and depth of provisions (Nemoto and López-González, 2021[18]).

[3] See Brazil's 9 July 2019 text-based proposal on issues discussed under the JSI: https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/INF/ECOM/27R1A1.pdf&Open=True as well as the addendum to that proposal with further text-based proposals largely in the context of digital trade facilitation; https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/INF/ECOM/27R1A1.pdf&Open=True.

[4] More disaggregated data from SISCOSERV shows that about 41.6% of the total value of exports of Business services was in other technical and professional services (NBS 11409), 36% was in consulting services (NBS 11401), and 9.4% was in Engineering services (NBS 11403) in 2018. Thirty-three per cent of the total value of import of business services was in other business services (NBS 11409), 33% was in advertisement services (NBS 11406) and about 20% in consulting services (NBS 11401).

[5] Although Brazil has a lower degree of GVC participation than other countries such as Peru or Chile, this does not mean that it is less integrated into GVCs. Indeed GVC integration is determined by many different factors and countries with larger domestic markets tend to exhibit lower rates of participation (see Kowalski et al (2015[14])).

# 2 Mapping Brazil's participation in digital trade

This chapter reviews existing data to map different aspects of Brazil's participation in digital trade. It shows that, despite considerable progress in connecting individuals to the Internet, Brazil still maintains barriers on ICT goods and services. This is affecting the ability of Brazilian firms to effectively leverage digital technologies to increase trade. In particular, Brazil lags in the use of ICT inputs in key export sectors such as agriculture, forestry and fishing and in manufacturing. However, Brazil has emerged as a strong regional supplier of digitally deliverable services. Moreover, further engagement in trade in parcels can provide new avenues for exports of Brazilian SMEs.

## Key messages

- Brazil has a strong potential to benefit from digital trade. Not only does trade represent nearly a third of its GDP but Brazil has tripled the share of its population with access to the internet in just 15 years.
- Barriers to ICT goods and services remain which could explain why Brazil is at the lower end of ICT use in the production of exports.
- Brazilian SMEs rely on trade in parcels as a means for accessing export markets.
- Digitally deliverable services represent an important and growing share of Brazil's exports, and, in this area, Brazil outperforms many regional partners.

Although traditional trade statistics record many of the trade transactions that fall under the purview of digital trade, they do not differentiate among transactions that have been digitally ordered or delivered. This means that digital trade remains largely invisible in official trade statistics (and more broadly in GDP statistics). While efforts are underway to better capture digital trade in official statistics (OECD-WTO-IMF, 2020[1]), it will be some time before robust and internationally comparable measures are developed (Box 2.1). This implies that gauging the extent of a country's participation in digital trade has to proceed with caution and using existing indicators and statistics to shed light on particular aspects of trade in the digital era.

This chapter reviews existing data to map different features of Brazil's evolving participation in digital trade. It first looks at general trends in digitalisation, placing Brazil in the context of the budding digital transformation. Then it identifies how Brazil has performed with respect to access to different *digital enablers* which include goods such as network equipment, the devices used to access the internet as well as telecommunications or computer and related services. The mapping exercise then turns to the use of ICT goods and services across different sectors, benchmarking Brazil's performance in this area against other countries. This is followed by an analysis of the evolving environment for trade in parcels, proxied by trade sent via the post, looking at issues related to getting goods to the border, across the border and beyond. The analysis then discusses digitally deliverable services and the share of trade that they occupy. A wider look at GVC participation across sectors of varying digital intensity follows.

Unfortunately, and owing to the unavailability of comparable data, the analysis largely focuses on the trade patterns before the COVID-19 crisis. However, where available, the analysis uses more recent data.

### Box 2.1. Measuring digital trade

Although digital trade remains largely invisible in official trade statistics, this does not mean that digital trade transactions are not being recorded. They are mostly captured in aggregates, but are not separately identifiable (OECD-WTO-IMF, 2020[1]). That is, traditional trade statistics for goods record many digitally enabled or ordered trade transactions, but they do not differentiate among goods transactions according to whether they have been digitally ordered or not. Similarly, in services, measurement of cross-border transactions has always been difficult, but for digital trade the challenge is compounded by the need to identify those services which are digitally ordered as well as those which are digitally delivered.

Some aspects of digital trade are less well covered in trade statistics. For instance, as the value of digitally ordered parcels often falls below *de minimis* thresholds, there is a concern that small parcel

trade may not be fully captured in official statistics (although the impact on overall values of trade is likely to be marginal). More significant challenges exist in the area of trade in services (digitally delivered), particularly to households. Data from VAT returns from firms are being used to improve current measurement. These approaches typically lead to upward revisions, but the overall impact remains small, amounting to revisions of less than 0.4% of total imports (OECD, 2018[2]).

To address these challenges, countries are exploring new data sources, such as credit card information, and developing projects linking business register data with customs data to provide information on the size of imports and exports by e-tailers (classified as NACE 47.91). Government statistical agencies are also exploring the scope for adding new questions to existing surveys.

Other challenges relate to when, how and whose trade flows should be recorded. Digital intermediary platforms, which facilitate transactions for a fee, do so without ever taking ownership of the products involved. The identification of these platforms in business registers, their classification in terms of the actual services they provide, and the treatment of the transactions they facilitate – including which parts should actually be recorded as being cross-border, and with which partner country – can pose significant conceptual and empirical challenges.

Efforts are underway to better capture digital trade in official trade statistics, including through the 'living' Handbook for measuring digital trade (OECD-WTO-IMF, 2020[1]) which is in its first revision and is co-ordinated by the OECD and WTO-led inter-agency Task Force on International Trade Statistics (TFITS). This taskforce brings together representatives from international agencies (OECD, UNCTAD, WTO, IMF, EUROSTAT, UN and the World Bank Group) plus more than 25 countries, including Brazil, China, India, Indonesia, the Russian Federation, South Africa and Thailand, in addition to many OECD members. Nevertheless, it will be some time before robust and internationally comparable measures are identified, reflecting also the broader challenges in measuring digitalisation (see (OECD, 2019[3])). Until better measures for digital trade are available, analysis has to proceed carefully, using existing statistics to shed light on particular aspects of trade in the digital era.

Source: OECD (2020[4]).

## 2.1. Brazil has made important progress connecting people to the Internet

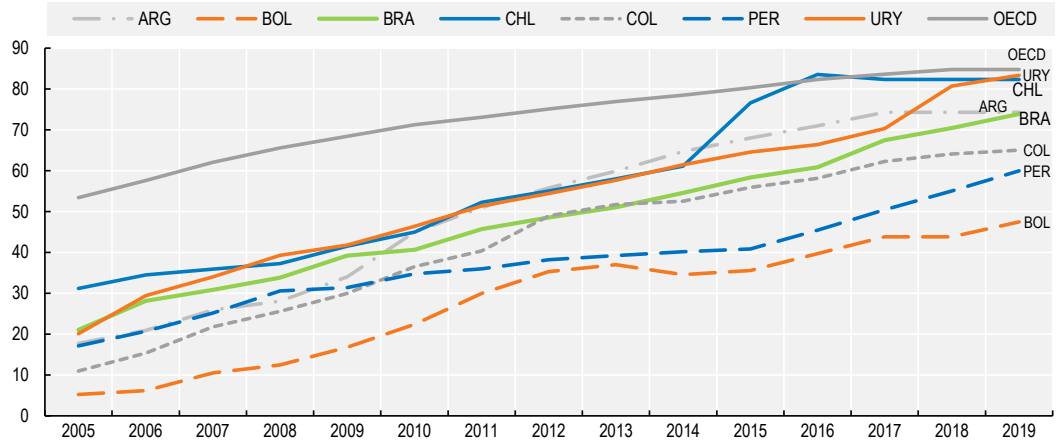
The potential for Brazil to benefit from digital trade, and digitalisation more broadly, will depend, in part, on the existing degree of internet penetration among consumers and producers. In this respect, while Brazil has made important progress, tripling the share of its population with access to the Internet in just 15 years, access remains below the OECD average (Figure 2.1).

At the same time, broadband penetration remains low, despite Brazil having lower than average prices for basic broadband (Figure 2.2). The growing rate of access to the Internet in Brazil is therefore largely driven by a higher adoption of mobile technologies where deployment across remote populations may also be easier (OECD, 2020[5]).

Recent OECD analysis identifies the persistence of digital divides along well-established lines. There is a widening age and income gap in terms of access to the Internet and there continues to be a rural-urban divide with penetration rates 25 percentage points lower in rural areas (OECD, 2020[5]). Tackling these digital divides will be important to ensure more inclusive access to the opportunities that digital trade offers to Brazilian firms and citizens.[1]

## Figure 2.1. Brazil has tripled the number of people connected to the internet in 15 years

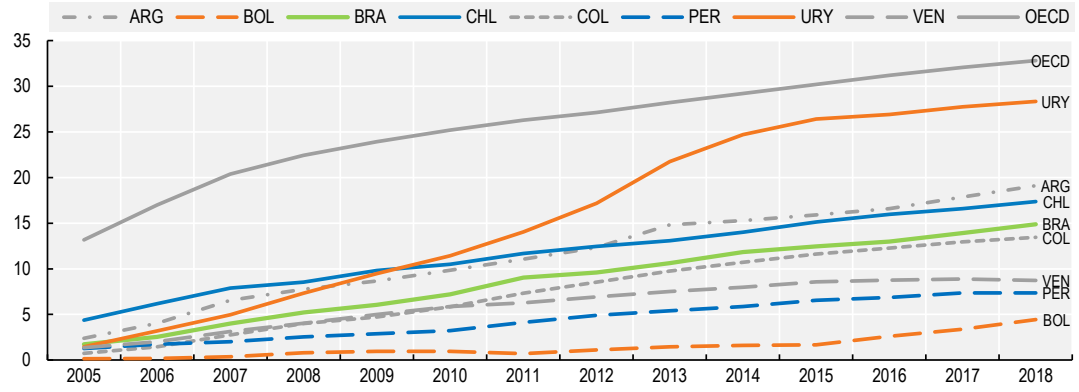
Share of population using the Internet (2005-2019)



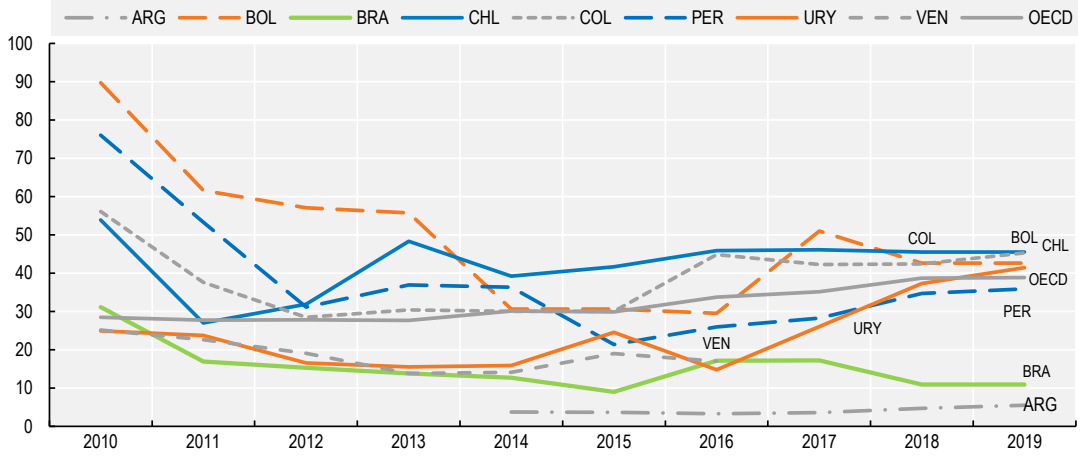

Note: OECD is the simple average of all OECD countries.
Source: Own calculations from ITU statistics.

## Figure 2.2. Broadband penetration is low despite low prices

a. Fixed broadband subscriptions per 100 inhabitants




b. Broadband basket price (PPP)




Note: Broadband basket prices 2008-2017 data refer to a fixed-broadband basket with a monthly data usage of (a minimum of) 1 GB. 2018 and onwards data refer to revised a fixed-broadband basket with a monthly data usage of (a minimum of) 5 GB.
Source: ITU.

## 2.2. ICT goods and services play a critical role in supporting digital trade transactions, but barriers on these products remain high

### *2.2.1. Barriers to digital trade enablers need to be reduced*

*Digital trade enablers* are the goods and services that are needed to support digital trade transactions. These range from the goods needed to support digital infrastructure such as fibre-optic cables, insulated cables, routers and switching appratus, to the devices that people and businesses use to connect to the Internet and the services that underpin access and support (e.g. telecommunications and computer and related services).[2]

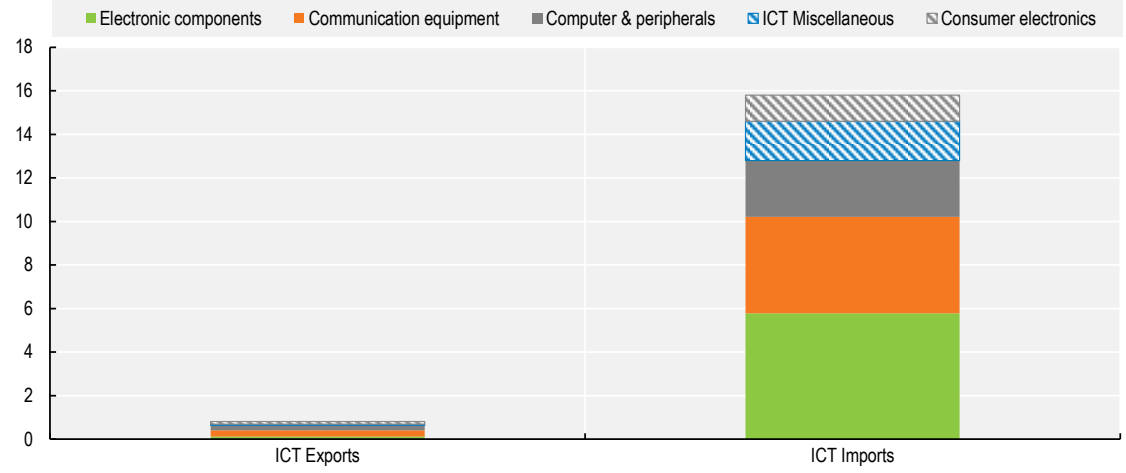
Trade plays a key role in the production of these products which are the result of complex and highly internationalised value chains. Indeed, on average, around 80% of the value added in domestic consumption of computer and related equipment is from abroad, making this sector one of the most internationalised globally. For IT and other information services, the foreign value added content of domestic consumption stands at about 40% (OECD, 2020[6]).

*Goods that support digital trade transactions continue to face barriers in Brazil*

Where goods are concerned, ICT imports make up around 9% of Brazil's total imports in 2019, however ICT exports accounted for less than 0.04% of Brazil's exports, underscoring that Brazil relies on trade for access to the ICT goods it needs (Figure 2.3). ICT items that are most imported by Brazil include telephone set parts (HS 851770, 15.7% of total ICT imports), processor chips (HS 854231, 12.1% of total ICT imports), and reception and transmission apparatus (HS 852990, 9.9% of total ICT imports). The main origin of ICT imports is China (47.2% of the total value of ICT imports), followed by the United States (10.9%) and Korea (9.4%).

### Figure 2.3. Brazil participates to ICT trade as an importer, mostly in electronic components and communication equipment

Value of ICT goods exports and imports, USD billion, 2019



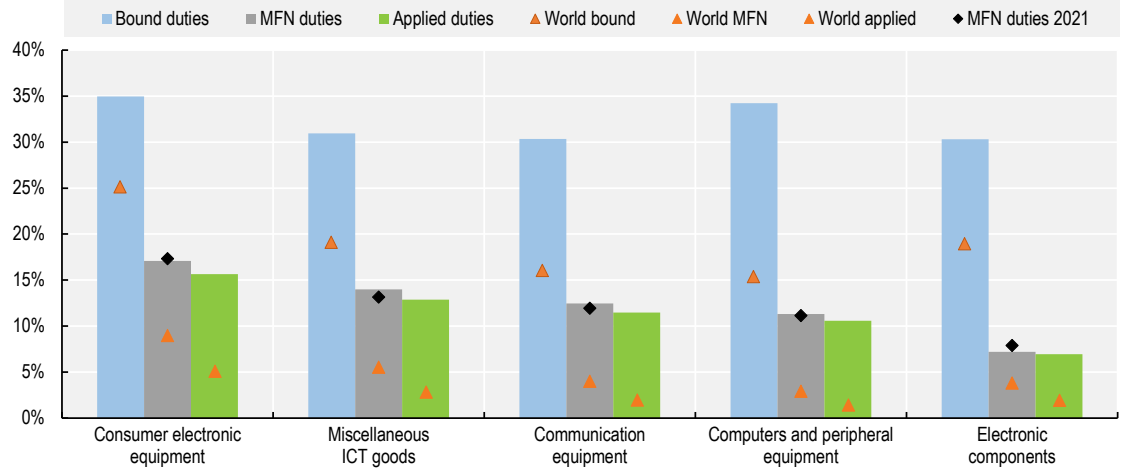

Note: ICT goods definition obtained from https://unctadstat.unctad.org/en/Classifications/DimHS2017Products_Ict_Hierarchy.pdf
Source: BACI database.

Despite Brazil's reliance on foreign markets for access to ICT goods, tariffs on these products remain high (Brazil is not a member of the WTO Information Technology Agreement (ITA), affecting the cost of access to digital technologies. Applied tariffs are highest on consumer electronic equipment, which includes items such as sound amplifiers and headphones. They are lower (and sometimes equal to zero) on electronic components such as semiconductors and semiconductor devices, processors and controllers, and other electrical apparatus (Figure 2.4).[3] However, and in general, Brazil's tariffs on ICT goods tend to be about 9-10 percentage points higher than world averages in all ICT product categories except electronic components (+5 percentage points relative to the world average) (Figure 2.4). This also remains the case after the COVID-19 pandemic, with MFN duties in 2021 closely resembling their pre-crisis levels. Brazil has also bound its duties at the higher level of 30-35%, potentially creating additional uncertainty related to the tariff overhang (WTO, 2015[7]).

ICT good imports in Brazil are also subject to a range of non-tariff measures (NTMs). The term NTM covers a diverse set of measures in terms of purpose, legal form and economic effect. NTMs comprise all policy measures other than tariffs and tariff rate quotes that have more or less direct impact on international trade. They can affect the price of traded products, the quantity traded or both. International trade in goods and services can be strongly affected by NTMs that originate from domestic regulations. These measures are generally imposed to address market failures, such as information asymmetries or negative externalities. They can provide a signal of quality, strengthening consumer confidence that foreign products abide by domestic regulations (see Cadot et al. (2018[8]), Henson and Jaffee (2007[9]), Maertens and Swinnen (2007[10]), Xiong and Beghin (2014[11])). But while countries may share the same objectives, they often apply different standards or methods to ensure compliance with regulatory measures. These differences can raise costs for businesses seeking to access more than one market.

## Figure 2.4. Brazil's import tariffs on ICT goods are highest on consumer electronic equipment, while they are lower on electronic components

Simple average tariffs for ICT goods by product category, Brazil and the World, 2021 and 2017-2018




Note: Tariff data is collected for the years 2017-2018 and averaged both Brazil and the World. The average over 2017-2018 is selected in order to gather a larger number of observations in the world average tariff. 'BRA applied duties 2021' are extracted from the WTO Integrated Database (IDB). Information on tariff rates for HS 851950, 852873, 854012 and 854040 is missing for Brazil in 2017-2018 in TRAINS. 'Applied duties' refer to effectively applied tariffs (AHS), i.e. A customs duty which is lower than the statutory duty – in light of preferential arrangements with exporters or lower temporary duties passed by Parliament or decided on and put into effect by a government for economic reasons (WITS, 2021).
Source: TRAINS and WTO Integrated Database.

According to the TRAINS data base which uses a harmonised classification and method for identifying NTMs and which was last updated in 2020 for Brazil, an average of 10-12 non-tariff measures (NTMs) apply per product (Box 2.2), with *computers and peripheral equipment* most affected.[4] The category of Technical barriers to trade (TBT) is most common. It includes issues such as certification, labelling, and authorisation requirements from relevant government agencies.[5] However, licensing, quotas and other quantity-control measures, which include 'non-automatic' licenses and import controls are also present.[6] A number of export-related measures, including export controls and other technical export measures are also in place[7] (see Annex Table 2.A.2 for a list of all NTMs identified).[8,9]

### Box 2.2. Non-tariff measures

Non-tariff measures refer to all measures affecting trade flows that are not tariffs. They take many forms and fulfil a broad range of objectives, some trade-related, others not.

Two different types are usually distinguished. The first, often referred to as "technical" measures, includes primarily sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) measures. The second type, often referred to as "non-technical" measures, includes quantitative restrictions (QRs), forced logistics or distribution channels, price measures and so forth.

- Technical measures: there are as many as 34 different types of SPS measures and 24 types of TBTs.
- Non-technical measures: there are five different types of BCM (border-control measures such as pre-shipment inspection) and 28 types of QRs (quantitative restrictions such as non-automatic import licensing, quotas, etc.).

Source: López González et al. (2019[12]).

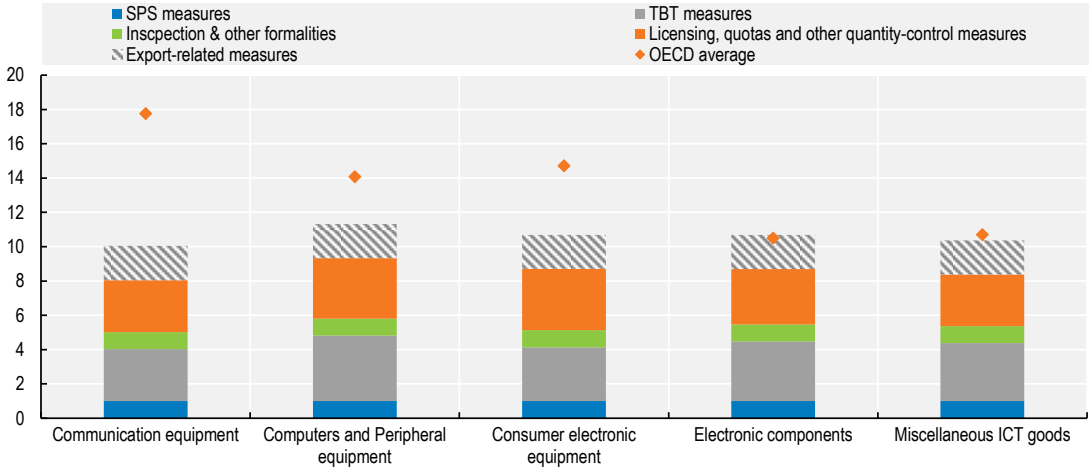
The overall number of NTMs per ICT product (Figure 2.5) is, however, lower than the OECD average, especially in *communication equipment*, *consumer electronic equipment* and *computer and peripheral equipment*. Nevertheless, it remains higher than for some regional partners like Chile (2.77 NTMs per ICT good on average), Colombia (2.03) and Mexico (3.15).

Although the average number of NTM per good is lower than OECD averages, Brazil ranks relatively high in terms of the number of goods affected by NTMs. The frequency ratio of NTMs, that is, the number of individual HS goods affected by at least one NTM as a share of the total number of ICT goods, is high (Figure 2.6). According to the TRAINS database, all ICT goods in Brazil are subject to at least one NTM measure in every NTM category (SPS measures,[10] TBT measures, Inspection and other formalities, licensing requirements and export-related measures).[11] This contrast with regional partners like Colombia where less than 30% of Colombia's ICT tariff lines face a TBT restriction and fewer than 20% of ICT tariff lines report NTM licensing requirements (Figure 2.6).

In particular, according to the TRAINS database, Brazil's ICT goods are subject to a higher number of export measures relative to other countries (red bar in Figure 2.6), which may affect Brazil's ability to participate in ICT value chains as an exporter. In addition, the broad application of Brazil's NTMs, as identified from the frequency ratios calculated from the TRAINS database, suggests that there might be potential for more targeted NTMs (in terms of product scope or adopting only some types of NTMs) to promote trade in ICT goods.

## Figure 2.5. Non-tariff measures may also hamper Brazil's participation in ICT trade, particularly in computer and peripheral equipment

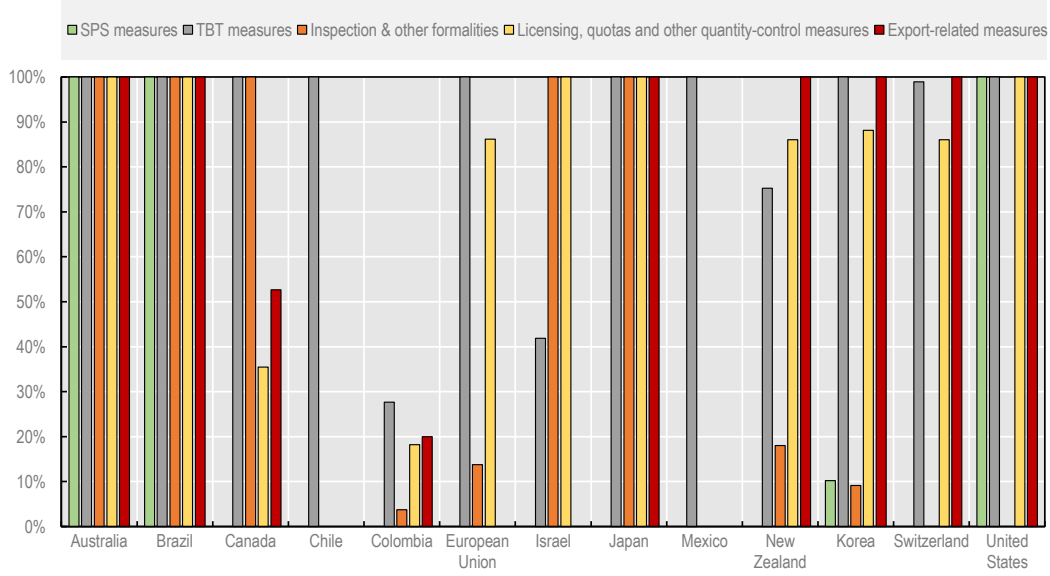
Average number of Non-Tariff Measures per ICT product imported, Brazil and OECD, 2018




Note: The figure shows the number of Non-Tariff Measures (NTMs) for each 8-digits HS codes for ICT imports in Brazil for the latest available year (2018). For instance, there are 100 8-digit products imported in the category of Computers and Peripheral equipment in Brazil, with 381 TBT barriers on these imports, meaning that Computer and Peripheral equipment products will face on average 3.81 TBT measures. The figure includes information on NTM measures of partial coverage. SPS measures relate to certification of conformity requirement (A83) in UNCTAD's international classification of non-tariff measures (UNCTAD, 2019). The comparison is made with respect to measures A,B,C,E,F,H,P of general application (bilateral measures are excluded). The OECD average includes the European Union as a whole and uses 2018 or the latest available year, identifying ICT goods in HS2012 when reported in this nomenclature.
Source: WITS TRAINS NTM database.

## Figure 2.6. Brazil applies several types of NTMs on ICT goods simultaneously

Frequency ratio for NTMs in ICT tariff lines (all categories), Brazil and OECD countries

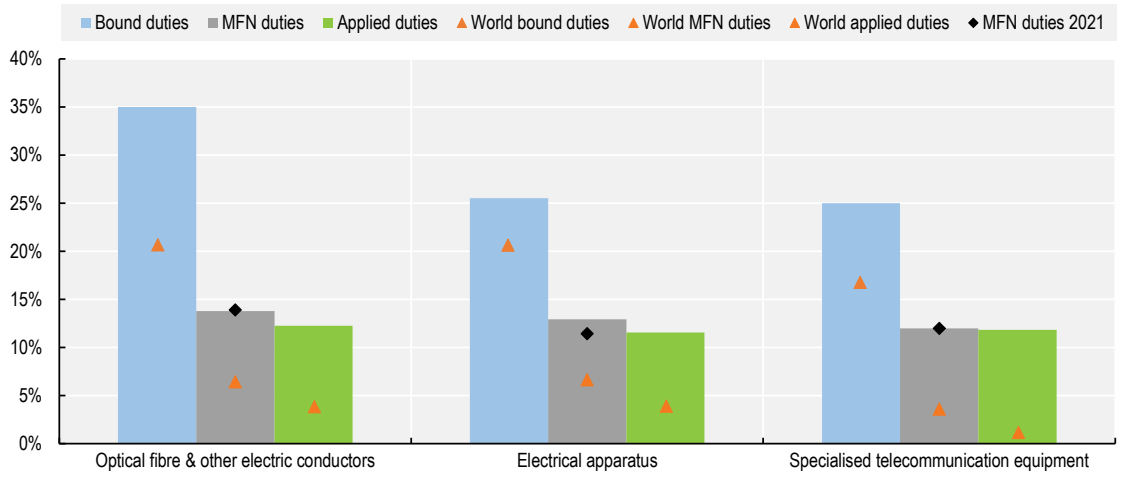



Note: The figure shows the frequency ratio (e.g. the proportion of HS 6 digit lines attracting an NTM over the total number of ICT HS 6 digit lines) for Brazil and OECD countries. A value of 100% for TBT measures means, for instance, that every ICT import at the 6 digit level attracts at least one TBT measure, while a value of 30% means that 30% of the total ICT tariff lines were subject to at least one TBT measure. When a bar is missing for a particular country/region it means that the country/region does not have restrictions of that type on ICT goods (e.g. no export-related measures).The comparison is made with respect to those NTM types for which data is available in all countries/regions (A,B,C,E,P), using data from 2018 or the latest available year, in the HS nomenclature of 2017 and 2012.
Source: WITS TRAINS NTM database, year 2018.

Beyond ICT goods, there are a range of products that underpin digital infrastructures such as electronic apparatus, cables, and specialised telecommunication apparatus. These also tend to attract relatively high tariffs of 12% and occupy an important share in Brazil's imports (USD 1.25 billion in 2019) (Figure 2.7). As for ICT goods, MFN duties also resembled their pre-COVID-19 levels in 2021.Trade liberalisation in these products is likely to contribute to reductions in prices of critical digital infrastructure products thereby promoting further digital connectedness in Brazil.

### Figure 2.7. Tariffs are relatively high on digital infrastructure goods

Simple average tariff rates on digital infrastructure goods, Brazil and the World, 2021 and 2017-2018




Note: The figure is based on a list of ten HS2017 goods. Optical fibre & other electronic conductors includes HS: 854442,854449,854470,900110. Electrical apparatus includes HS 853630, 853650, 853669, 853690, 853810. Specialised telecommunication equipment includes HS 903040.
Source: TRAINS and WTO IDB database.

*Services that underpin access and use of digital solutions also remain subject to barriers*

ICT services, which include telecommunication and computer services, are the backbone of digitally enabled activities. Indeed, cloud computing, remote storage, or communication and related software solutions enable the digital transformation of businesses. In Brazil, in 2019, ICT services represented over 7% of both services exports and imports with this share rising in 2020 to 8% of exports and 12% of imports (Figure 2.8). In particular, *computer services* exports accounted for about USD 2.07 billion while imports were worth USD 5.02 billion in 2020.The expansion of ICT services trade in 2020, in the contexts of a generalised reduction in services trade, reflects the consequences of the pandemic, with activities increasingly becoming digital. However, the growth of the sector pre-dated COVID-19, meaning that the pandemic appears to have accelerated an existing pre-crisis trend (Figure 2.8). The relatively high participation in ICT services exports also contrasts with the relatively low degree of participation in ICT goods exports and places Brazil as a more specialised exporter of ICT services.

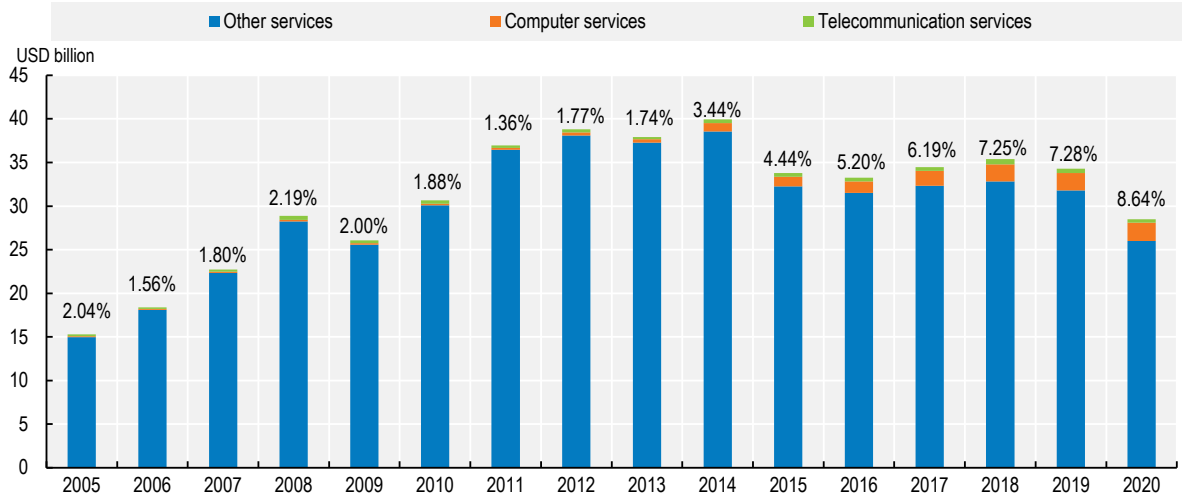
According to firm-level data, the United States is Brazil's main trade partner for ICT services, followed by regional partners (Chile is the destination of 18% of ICT exports) and other OECD countries[12] (Figure 2.9). Brazilian firm level data also confirms that 'information and technology services' make up the bulk of Brazil's ICT services exports, totalling 91% of the total value of ICT exports in 2018. However, telecommunication services appear to play a more important role on the import side, with 27% of the total value of ICT imports in 'telecommunication, broadcasting and information services'.

However, despite the importance of computer services imports for Brazil, trade in this category of services might be restricted owing to the presence of relatively high restrictions. According to the OECD Services Trade Restrictiveness Index, Brazil ranks 44$^{th}$ out of 48 economies in terms of restrictions to trade in

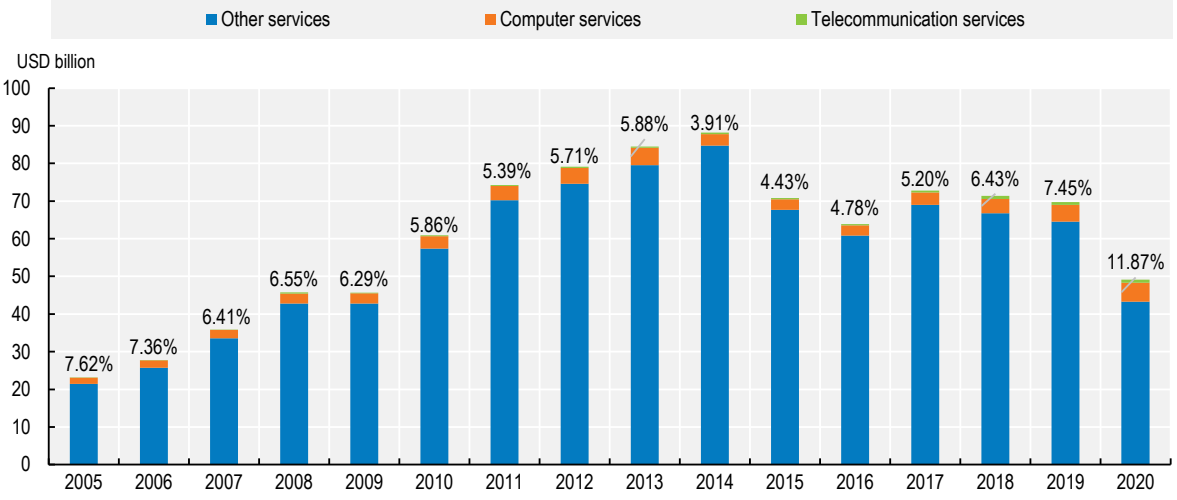
computer services, well above OECD averages. Moreover, Brazil has become more, rather than less, restrictive to trade in this sector since 2014 (Figure 2.10).

## Figure 2.8. ICT services represent a significant and growing share of Brazil's services trade

a. Exports

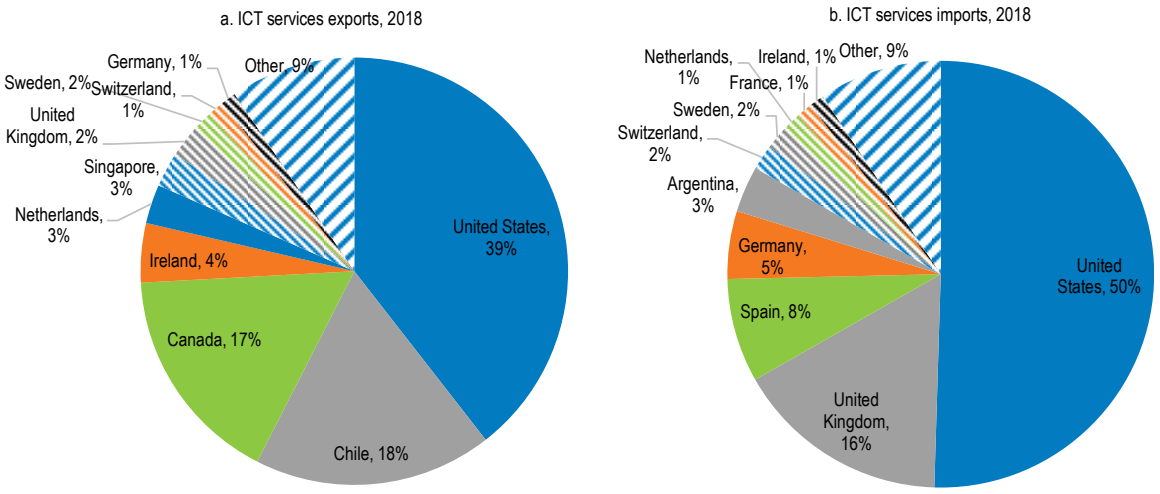



b. Imports




Note: Percentage figures refer to the sum of Computer and Telecommunication services as a share of total services exports and imports. Telecommunications (9.1) and Computer Services (9.2) in EBOPS 2010 (BPM6) are classified as ICT services. See OECD Guide to Measuring the Information Society (2011:22). Data labels show the share of ICT services imports over total services imports.
Source: UNCTADSTAT Balance of Payments statistics, EBOPS classification.

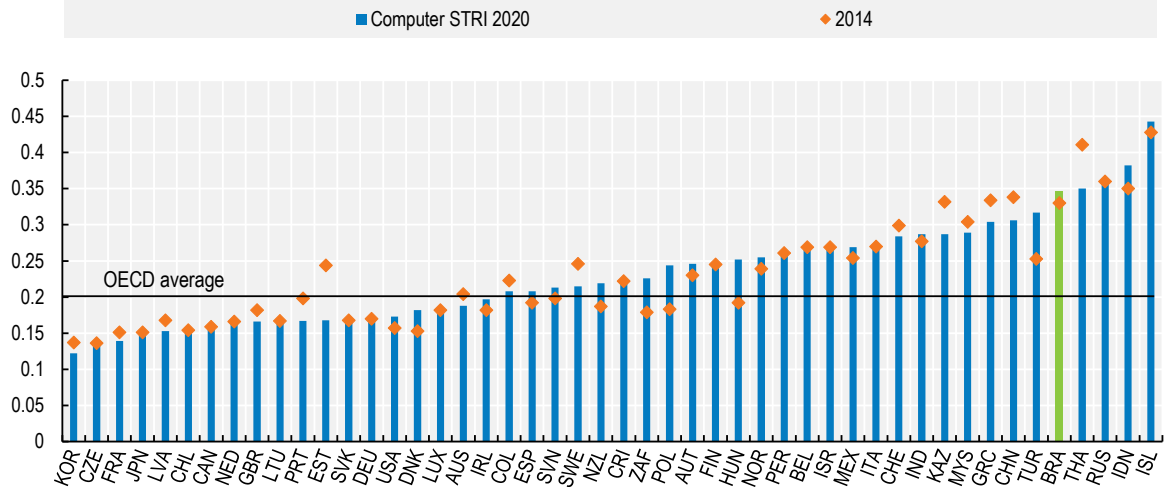
## Figure 2.9. The United States is the main export and import partner for ICT services, followed by regional partners and OECD countries




Note: ICT Services are defined as Serviços de tecnologia da informação (NBS 115) and Serviços de telecomunicação, difusão e fornecimento de informações (NBS117).
Source: OECD using SISCOSERV, year 2018.

## Figure 2.10 Brazil maintains high barriers in computer services, despite the importance of this sector in overall services imports

OECD Services Trade Restrictiveness Index, 2014-2020



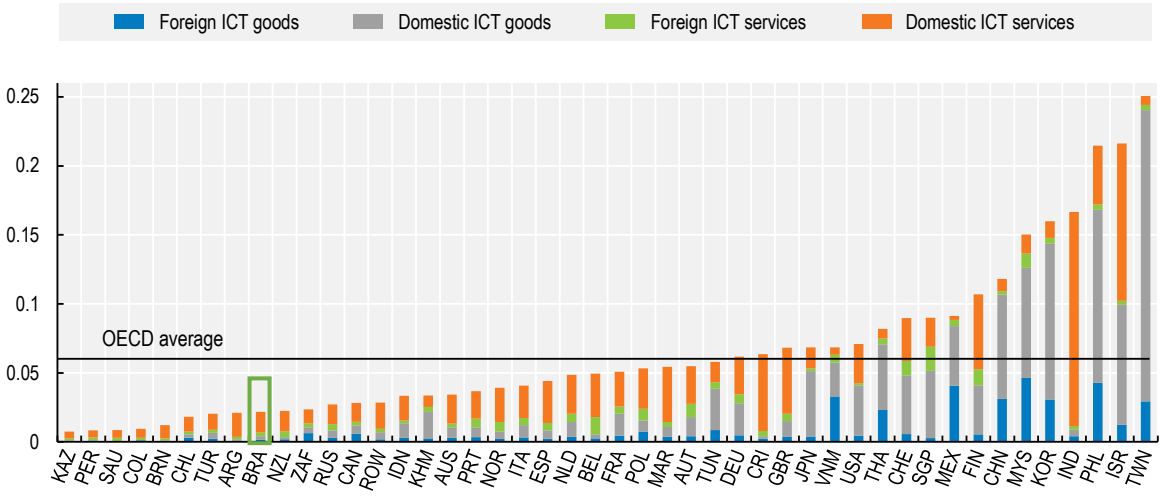

Note: Higher values identify higher restrictions. Triangles identify values for 2014.
Source: OECD Services Trade Restrictiveness Index.

### *2.2.2. Brazil has a low share of ICT inputs in the production exports*

In the absence of more detailed statistics on the adoption of digital technologies, the use of ICT goods and services inputs to produce non-ICT exports can provide a useful proxy measure for the digital footprint of economic activity.[13] In this respect, and on aggregate, Brazil appears to be at the lower end of use of ICT inputs to produce non-ICT exports (Figure 2.11). However, this reflects, in part, that Brazil is a natural resource exporter and that these sectors tend to rely less on ICT inputs.

## Figure 2.11. Brazil is at the lower end of ICT use for non-ICT exports

Domestic and foreign ICT used in production of non-ICT goods and services exports (2016)



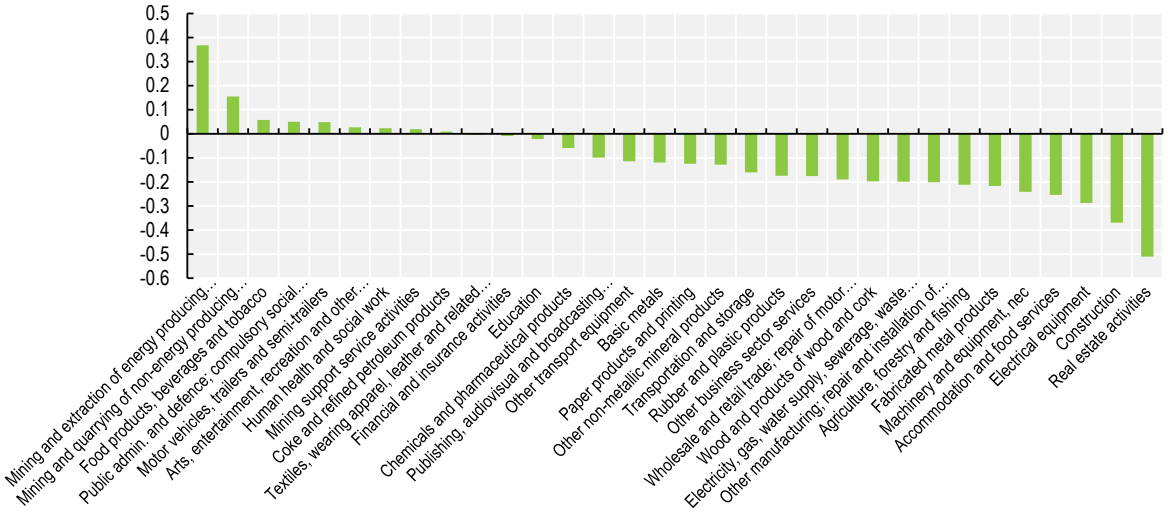

Note: ICT use comprises ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63). Values identify the value added of ICT goods and services as a share of total non-ICT exports.
Source: Own calculations using OECD TiVA ICIO (2018).

Indeed, when looking at ICT use across sectors, Brazil exhibits a higher use of ICT inputs in the production of non-ICT exports than the rest of the world in mining, quarrying and food production (Figure 2.12). However, the relative use of ICT goods and services in other sectors is otherwise low, including in important export sectors such as *agriculture, forestry and fishing*.

Before turning to a more detailed analysis of the use of ICT in the production of exports across different sectors, it is worth noting that differences in use of ICT can arise for reasons beyond differences in the adoption of outsourced ICT technologies. For instance, they may reflect different export product compositions within broad industrial categories. That is, it might be that some form of agriculture production has the potential to be more ICT intensive than another (aggregation bias). If a country trades a particular product more intensively then this will be reflected in the ICT use shares provided. Nevertheless, within broadly similar aggregates, the analysis can provide useful guidance on comparative performance.

## Figure 2.12. Relative to other countries, Brazil exhibits strong ICT use in natural resource sectors

Use of ICT inputs in non-ICT exports relative to the rest of the world, 2016




Note: The figure shows the share of ICT goods and services inputs used by Brazil divided by the share of ICT goods and service inputs used by the rest of the world across a range of sectors. Positive values identify a higher use of ICT inputs by Brazil than other countries. ICT inputs are ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63).
Source: Own calculations based on OECD TiVA database (2018).

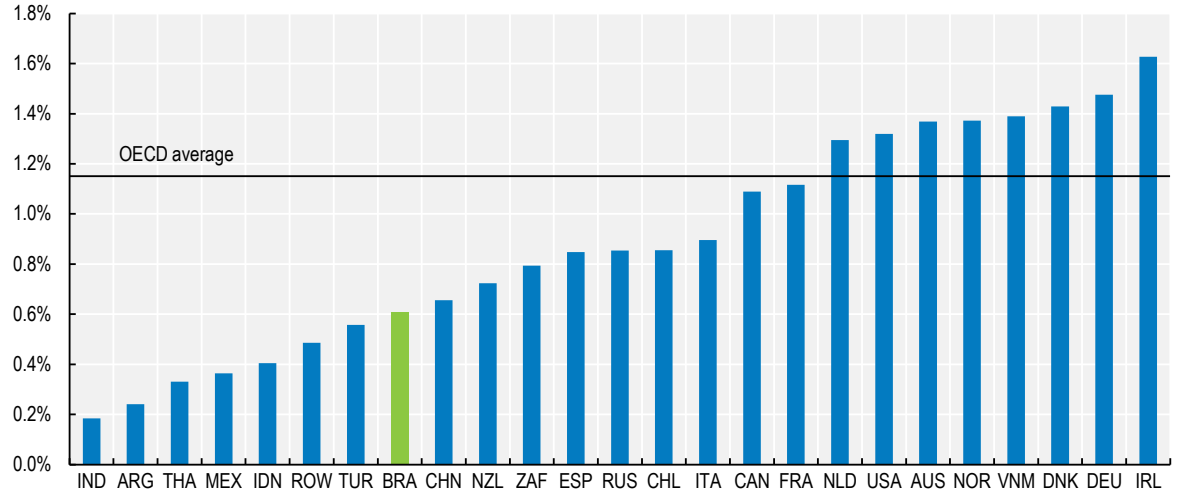
### *Use of ICT inputs in agro-food exports*

Agro-food products represents about a third of Brazil's total goods and services exports, in turn representing around 5.4% of global agro-food trade. In terms of average use of ICT inputs, whether domestic or imported, the agro-food sector is at the lower end of the spectrum – on average, only about 1.1% of the value of global agro-food exports are composed of ICT inputs.[14] However, Brazil has an even lower content of ICT inputs in its agro-food exports (around 1%), largely driven by a low use of ICT inputs in agriculture rather than in food sectors (Figure 2.13).[15]

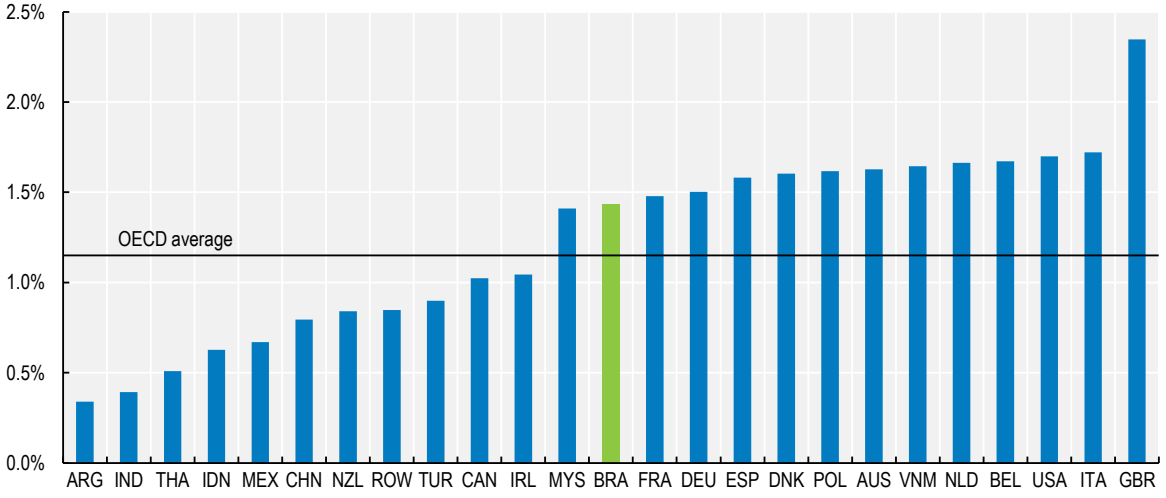
This shortfall matters because positive changes in ICT use as a share of agro-food exports are associated with positive changes in gross exports (Figure 2.14). Brazil may therefore not be making the most out of ICT inputs to develop its agro-food exports which represent a significant share of total merchandise exports. More needs to be done to enable a greater use of ICT technologies in production and trade, especially in *agriculture, forestry and fishing*.

## Figure 2.13. ICT use is also low in agro-food sectors

a. Agriculture, forestry and fishing use of ICT goods and services to produce exports

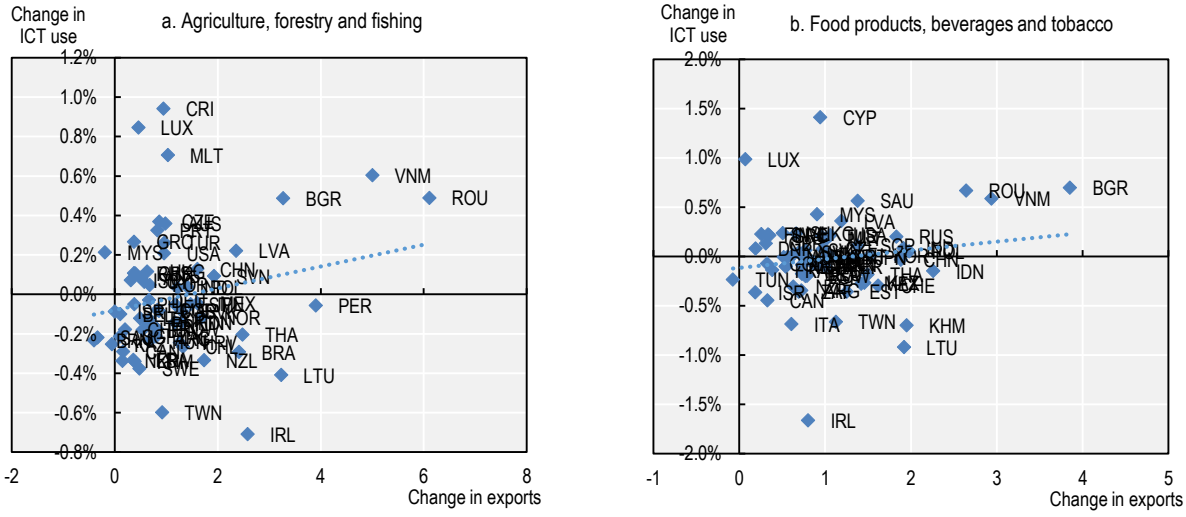



b. Food products, beverages and tobacco use of ICT goods and services to produce exports




Note: The figure shows the value of ICT inputs (domestic and imported) in the production of sectoral exports for the top 25 producers of agro-food trade. ICT use comprises ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63).
Source: Own calculations based on OECD TiVA database (2018).

## Figure 2.14. The use of ICT inputs is associated with growing exports in agro-food sectors



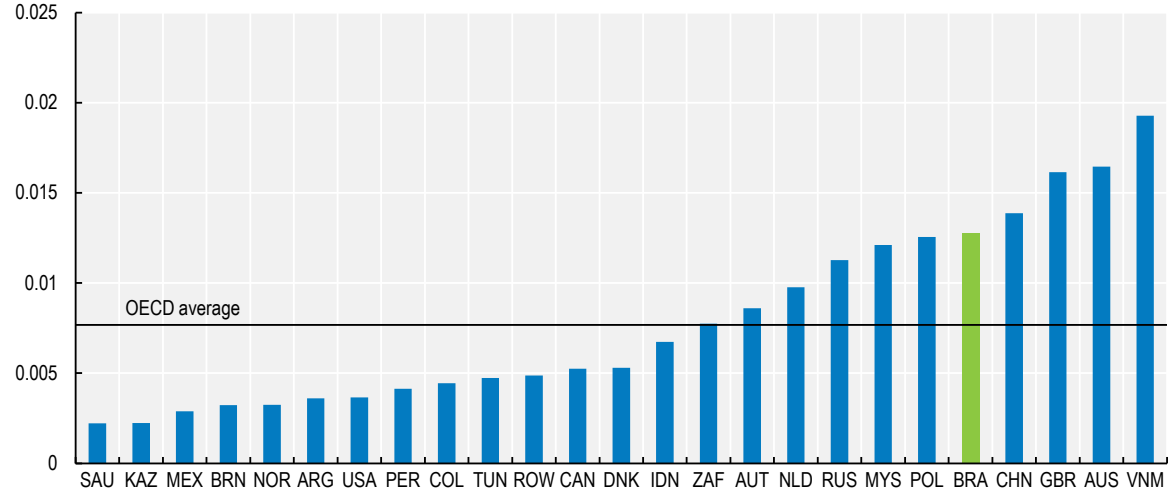

Note: The horizontal axis identifies the percentage changes in the value of exports net of ICT inputs. The vertical axis shows the percentage point change in the use of ICT inputs as a share of exports. ICT use comprises ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63) and includes domestic and international value added.
Source: Own calculations from OECD TiVA 2018.

### *Use of ICT inputs in mining sectors*

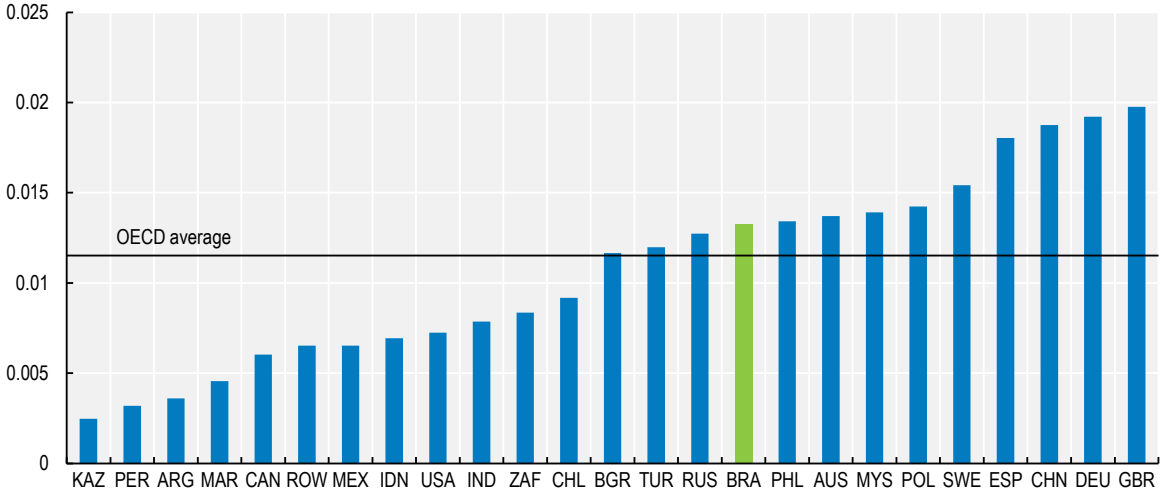
The two sectors of activity with the highest relative use of ICT inputs in Brazil are *mining and extraction of energy producing products* and *mining and quarrying of non-energy producing products* (Figure 2.15). The ICT content of Brazilian mining and extraction exports is the 5th highest in the world in a sector that represents just below 5% of Brazilian goods and services exports in 2016 and 1.16% of global goods and services trade. In turn, the ICT content of *mining and quarrying of non-energy producing products* is also within the top ten. This is a sector which represents 7% of Brazilian gross exports of goods and services, which, in turn, represents 7% of global trade in this sector. High ICT use is likely to reflect a more advanced exploitation of digital technologies in these sectors contributing to Brazil's strong comparative advantage.

## Figure 2.15. ICT use is high in mining

a. Mining and extraction of energy producing products




b. Mining and quarrying of non-energy producing products



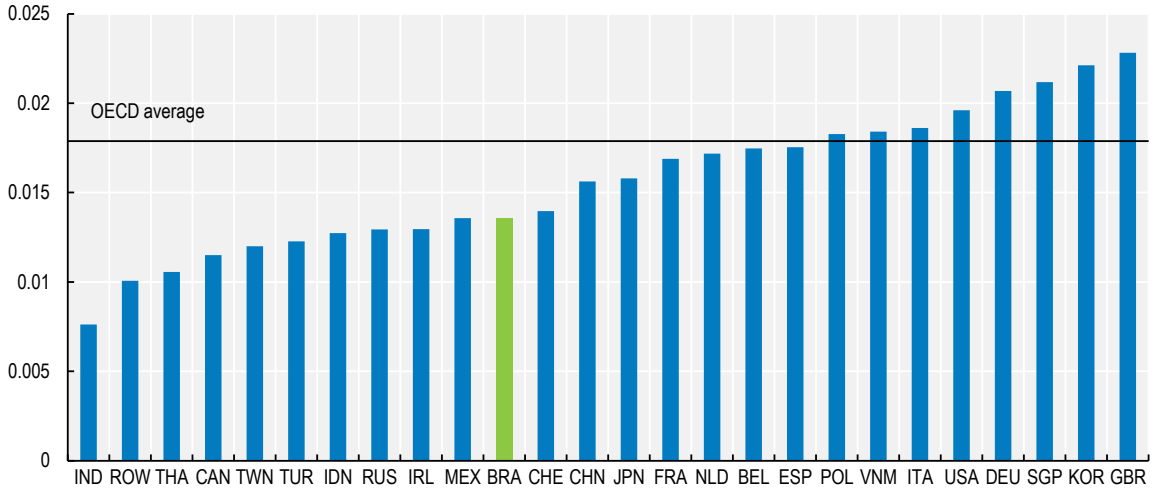

Note: The figure shows the value of ICT inputs (domestic and imported) in the production of sectoral exports for the top 25 producers of Mining and mining and quarrying. ICT use comprises ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63).
Source: Own calculations based on OECD TiVA database (2018).

### *Use of ICT inputs in manufacturing exports*

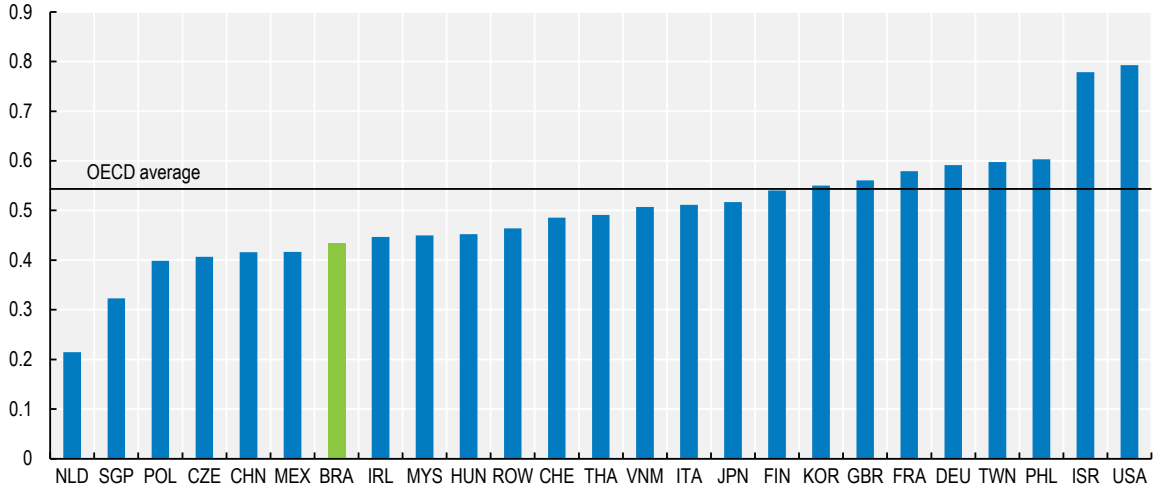
Manufacturing exports represented 35% of Brazil's exports of goods and services in 2016 (key export sectors include basic metals and motor vehicles occupying 7.3% and 5.5% of gross exports of goods and services). While there is heterogeneity in the use of ICT inputs across sectors, including in motor-vehicles where Brazil is above world averages, the use of ICT inputs in Brazil's manufacturing exports is, relative to other countries, low (Figure 2.16). This is especially the case in the production of ICT goods where Brazil does not appear to have a comparative advantage and where the use of ICT inputs as a share of exports is much lower than OECD averages.

## Figure 2.16. Manufacturing and ICT goods exports also have a low share of ICT inputs

a. Non-ICT manufacturing




b. ICT goods



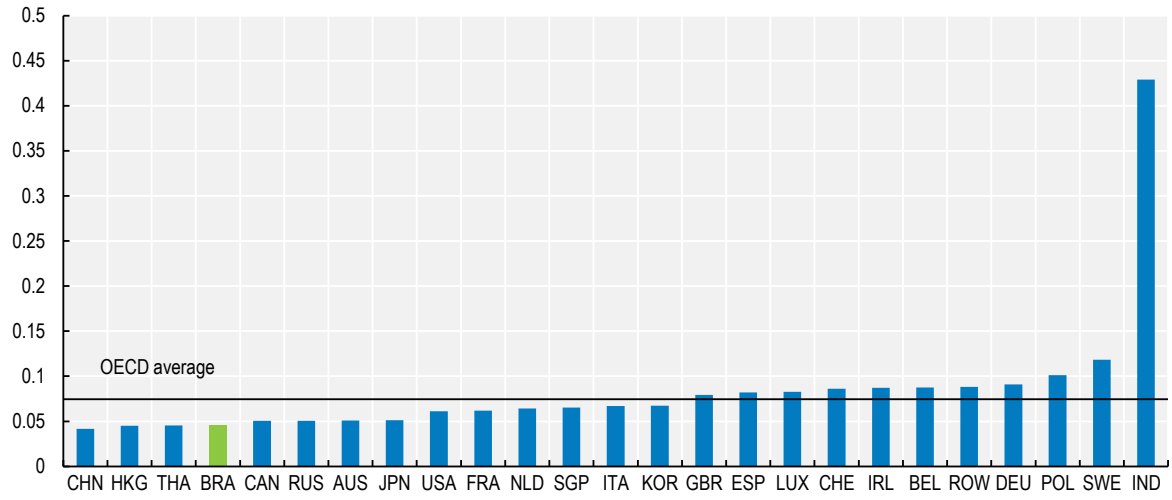

Note: The figure shows the value of ICT inputs (domestic and imported) in the production of manufacturing exports for the top 25 producers of manufacturing exports globally. ICT use comprises ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63).
Source: Own calculations based on OECD TiVA database (2018).

### *Use of ICT inputs in services exports*

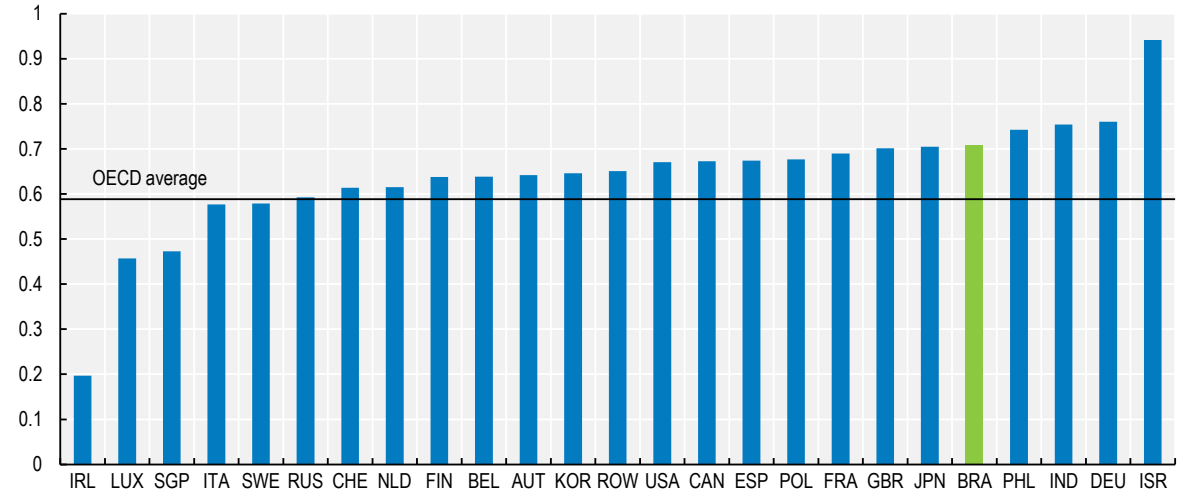
Services exports represent about a quarter of Brazil's gross exports with wholesale and other business services representing half of exported services. However, the use of ICT inputs in these sectors remains low relative to other countries and well below OECD averages although use of ICT inputs in ICT exports are high (Figure 2.17).

### Figure 2.17. Non-ICT services have a low ICT input use

a. Non-ICT services




b. ICT services




Note: The figure shows the value of ICT inputs (domestic and imported) in the production of services exports for the top 25 producers of services exports globally. ICT use comprises ICT goods (ISIC rev 4 sector 26) and ICT services (ISIC rev 4 sectors 61 to 63).
Source: Own calculations based on OECD TiVA database (2018).

## 2.3. Trade in parcels can be an important channel for SME exports

The wider use of digital platforms to order goods has contributed to a dramatic increase in the number of parcels crossing borders. By some estimates, over the last decade, the volume of cross-border parcel trade has grown over three times faster than the volume of global merchandise trade (UPU, 2020[13]). Compared to 'traditional' container trade, parcel trade involves a more complex network of interlinked actors and policies. This means that ensuring that parcels get to where they are needed requires policy action across a diverse set of issues, including in the context of physical distancing as a result of the COVID-19 pandemic.

Measuring trade in parcels is difficult. Most parcels are delivered by post or via courier services and fall under *de minimis* thresholds. This means that they are often not captured in customs statistics. Still, estimates suggests that parcel trade is growing and that it amounts to an average of 1-3% of total trade (with cited peaks of up to 15% in countries like Azerbaijan) (OECD-WTO-IMF, 2020[1]). At the same time, while there is likely to be a strong correlation between trade in parcels and digital ordering, not all trade in parcels will be digitally ordered. That said, recent analysis shows that parcel trade might be more sensitive to digitalisation than traditional trade, that is, that progress in connecting individuals and firms to the internet might increase trade in parcels more than 'traditional' trade (López González and Sorescu, 2021[14])). However, owing to the paucity of data, any analysis of trade in parcels has to proceed with care, using available statistics to shed lights on different elements of this evolving environment.

### *2.3.1. Smaller firms are especially reliant on parcels to export*

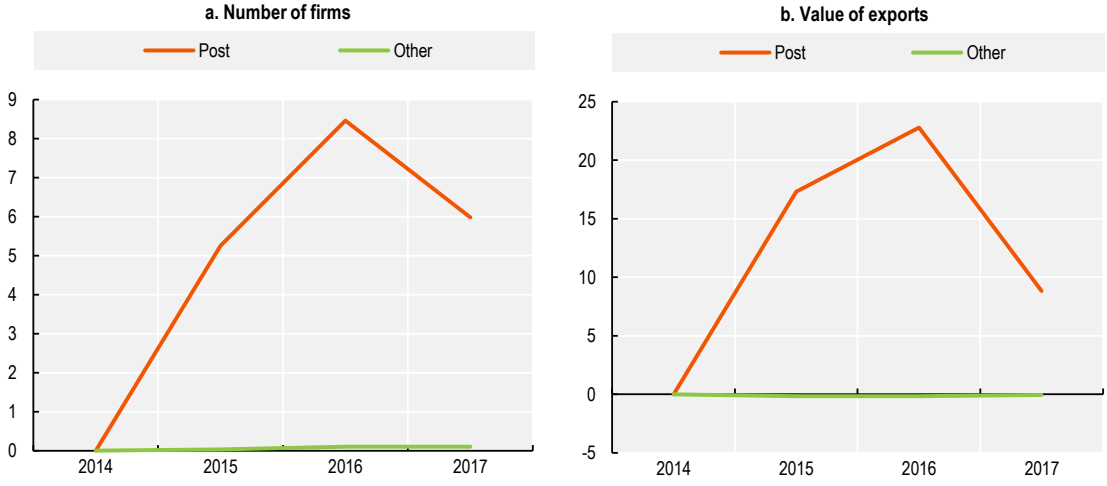
Although only capturing certain aspects of trade in parcels, insights can be gleamed from looking at trading activities by postal mode of delivery (see also López González and Sorescu (2021[14])). This, however, is an imperfect measure of trade in parcels. On the export side, most small operations are carried out via a simplified export declaration (DSE) which has a more simplified procedure for data collection and weak validation (this was discontinued on 2018). On the import side, parcels are often dealt with by postal services and due, to challenges in filling out documentation as well as lower use of automated declaration of information on cross-border transactions, are often not captured in trade statistics. These are the traditional challenges associated with capturing trade in parcels as noted in the *Handbook for Measuring Digital Trade*.

Data on modes of delivery, obtained from the SECEX database, while unable to capture the overall volume of trade in parcels, can help understand certain facets of this evolving environment related to changes and trends in cross-border trade, firm characteristics and main sectors of activity.

Where changes are concerned, since 2014, the number of firms exporting using postal delivery increased nearly six-fold with an even higher increase in the value of this trade (nearly nine-fold). Although only capturing part of the value of trade in parcel exports, these numbers suggest that there has been fast growth in this form to trade, likely related to growing adoption of digital technologies (Figure 2.18).

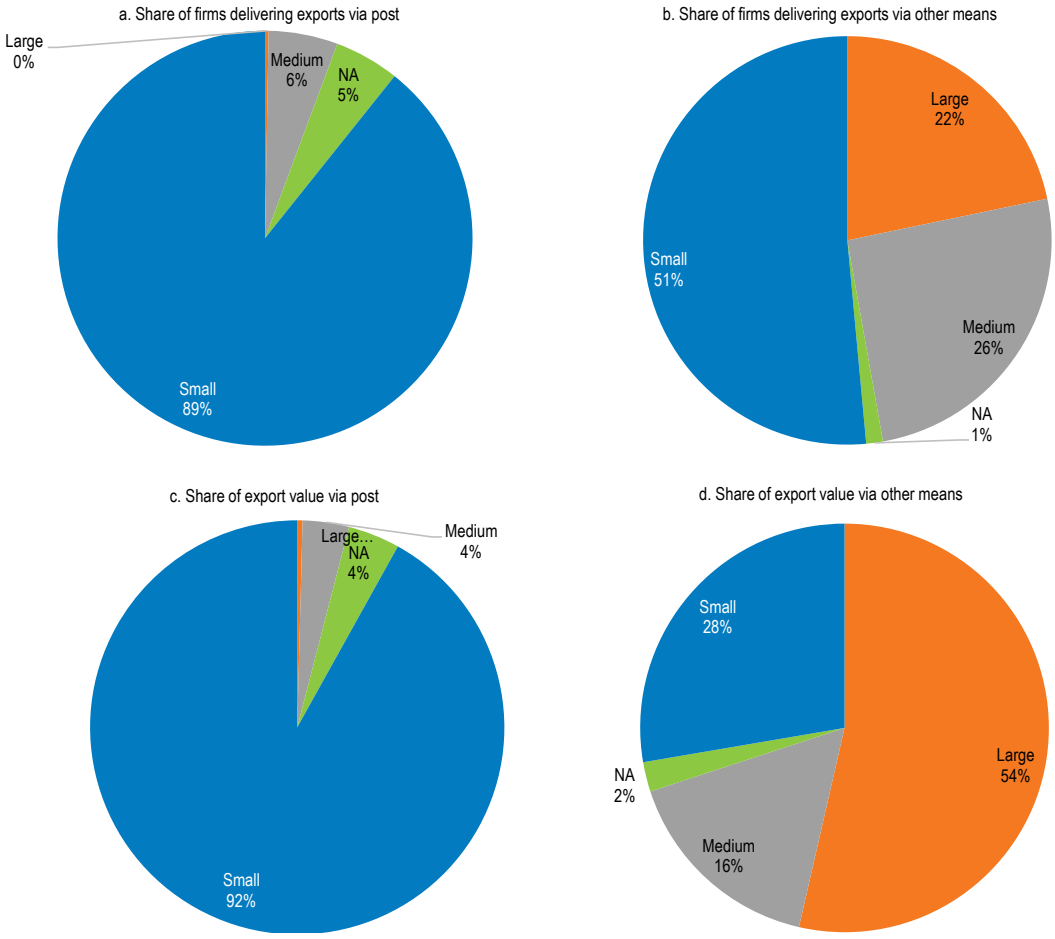
**Figure 2.18. The number of Brazilian firms using post as a mode of export delivery has been growing fast**

Changes since 2014




Note: The figure maps the number of firms and the value of exports by mode of delivery. Post includes those items that have been sent via the post while other includes items sent via land, air and water transport.
Source: Author's calculations based on SECEX.

## Figure 2.19. Postal delivery is most important for Brazilian SMEs




Note: Small firms are those below 50 employees, medium between 50 and 249 and large firms have at least 250 employees.
Source: Author's calculations based on SECEX.

The products exported via parcels differ significantly from those exported by other means. The number of goods exported is relatively limited but has grown, from 40 in 2014 to 189 in 2017. By contrast, Brazil exported 2912 products by other means in 2014 and 2949 in 2017 (Table 2.1).

## Table 2.1. Trade in parcels occupies very few products

Number of products exported

| | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| Via both post and other | 40 | 174 | 234 | 187 |
| Via post | 40 | 176 | 236 | 189 |
| Via other means | 2912 | 2876 | 2922 | 2949 |

Note: 'Other means' includes items sent via land, air and water transport.
Source: Author's calculations based on SECEX.

Parcel exports in Brazil also have a higher value to weight ratio and are more concentrated. The top 10 parcel exports occupy 64% of exports via parcels while the equivalent across the different modes of exports is 48%. At the same time, parcel trade appears to occupy final products, largely in manufacturing sectors (Table 2.2), in contrast to the structure of Brazil's exports which tend to be natural resource based (Chapter 1).

### Table 2.2. Brazilian parcel exports is very concentrated and occupies final goods

| HS products code | Product description | Share of production post exports | Share of product in exports by other means |
|---|---|---|---|
| 051000 | Human hair, unworked, whether or not washed or scoured; waste of human hair | 21.8% | 0.0% |
| 900130 | Contact lenses | 15.3% | 0.0% |
| 710399 | Precious stones -- other | 5.2% | 0.0% |
| 610463 | Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls | 5.0% | 0.0% |
| 611241 | Tracksuits, ski suits and swimwear, knitted or crocheted Of synthetic fibres | 3.8% | 0.0% |
| 490199 | Printed books, brochures, leaflets and similar printed matter, whether or not in single sheets | 3.4% | 0.0% |
| 920992 | Parts and accessories for the musical instruments of heading 9202 | 3.0% | 0.0% |
| 711719 | Imitation jewellery | 2.6% | 0.0% |
| 851180 | Electrical ignition or starting equipment of a kind used for spark-ignition or compression-ignition internal combustion engine | 2.2% | 0.0% |
| 640299 | Other footwear with outer soles and uppers of rubber or plastics | 1.8% | 0.1% |
| SUM | | 64.0% | 0.2% |

Note: 'Other means' includes items sent via land, air and water transport.
Source: Author's calculations based on SECEX.

### *2.3.2. Postal services provide foundational support to trade in parcels*

Part of the regulatory environment that matters for parcel trade relates to the ability to receive goods and to get these to the border. In this respect, postal services provide foundational support to trade in parcels. Relative to other neighbouring countries, Brazil performs well in terms of coverage of postal services (Table 2.3). That is, it has one of the highest staff per office ratio and offices that are relatively well connected to electronic networks. At the same time, the share of the population receiving mail at home is above 97% with only 1.5% of the population without postal services (the lowest among those sampled).

However, parcel trade might be curtailed by existing measures that affect post and courier services. According to the OECD STRI, Brazil is the third most restrictive country (out of 44) in the courier services sector. At the same time, Brazil's existing *de minimis* regime covers postal packages valued at USD 50 or less shipped for personal (non-commercial) purposes meaning that many parcels, even those of little value, have to be cleared at customs and pay border and internal taxes. This goes against the existing trend where countries have increasingly adapted and expanded their *de minimis* levels to cater for growing trade in parcels (See Chapter 4 for a discussion of the environment faced by parcels in Brazil).

**Table 2.3. Domestic postal services have a relatively high performance in terms of coverage, 2018**

| | Brazil | Chile | Colombia | Paraguay | Uruguay | Argentina | Mexico |
|---|---|---|---|---|---|---|---|
| Staff per office | 8.78 | 12.22 | 3.92 | 3.17 | 7.17 | 4.38 | 0.89 |
| Average area covered by a permanent office (km²) | 709.3 | 1579.6 | 858.9 | 1355.8 | 681.0 | 731.9 | 14878.0 |
| Average number of inhabitants served by a permanent office | 17 568.1 | 37 995.8 | 37 300.2 | 22 704.3 | 13 502.0 | 11 428.5 | 16 735.0 |
| Share of post offices accepting financial transactions | 24% | 47% | 12% | 17% | 61% | 39% | 8% |
| Share of permanent post offices connected to an electronic network | 62% | 47% | 12% | 0% | 66% | 19% | 7% |
| Percentage of the population having mail delivered at home | 97.3% | | 99.0% | 60.0% | 94.3% | 93.0% | 88.6% |
| Percentage of the population without postal services | 1.5% | | 0.1% | 10.0% | 4.0% | 3.0% | 2.0% |

Note: Values are for 2018, except for Paraguay (2017) and Argentina (2015) which were the latest available.
Source: Own computations based on UPU statistics.

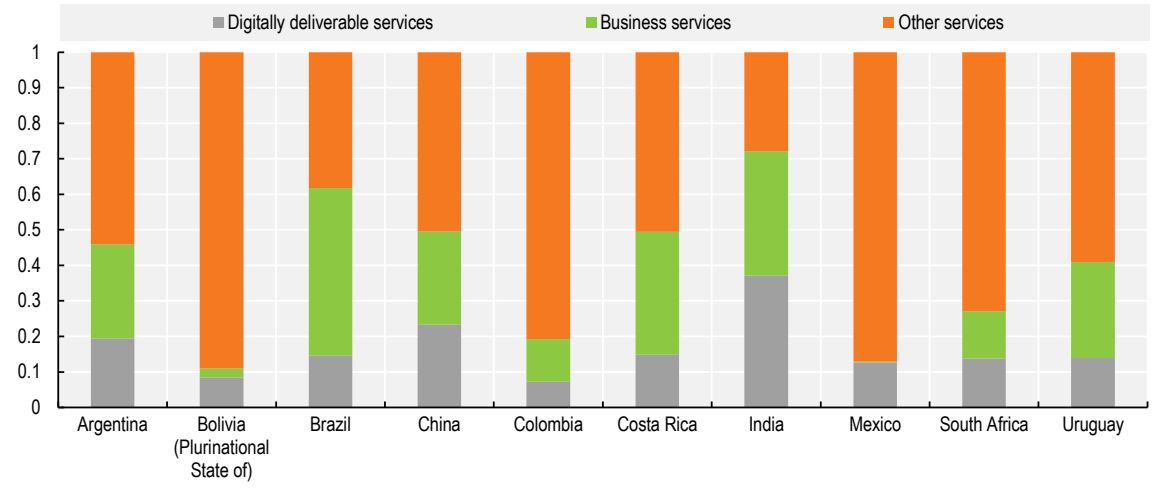
## 2.4. Digitally deliverable services account for an important and growing share of Brazil's services trade

Digitally deliverable services are those that can be delivered over digital networks (OECD-WTO-IMF, 2020[1]). They include ICT services (i.e. computer and telecommunication services) and other business services such as financial or consultancy services and audio-visual services. Digitally deliverable services play an important role in Brazil's exports and imports (Figure 2.20), accounting for 61.7% of services exports and 51.7% of services imports in 2018. This is significantly higher than most trade partners in the region and also high by OECD standards.[16]

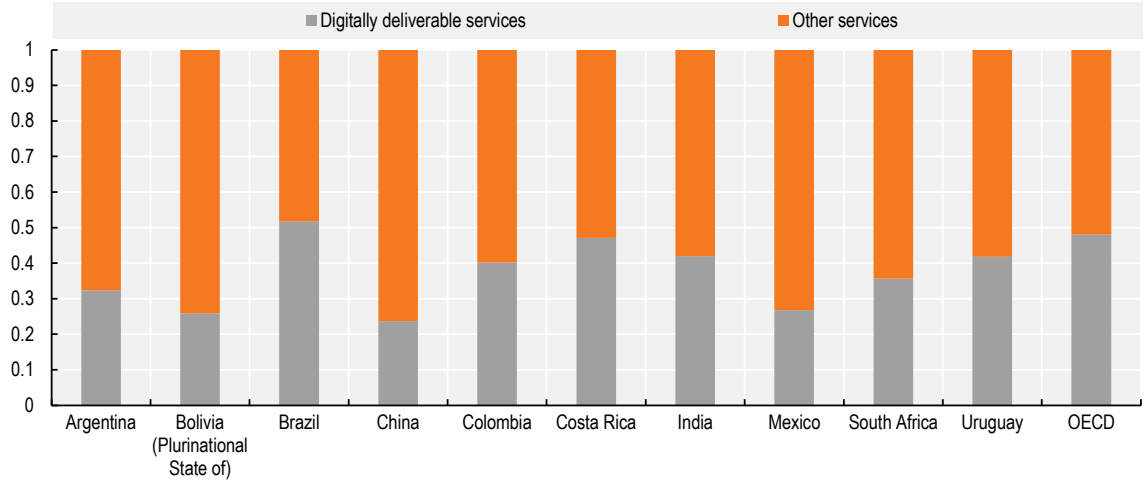
Over time, the share of digitally deliverable services imports has been relatively stable, representing around half of Brazil's services imports, with the exception of 2020 when they experienced a notable expansion (Figure 2.21). However, digitally deliverable services exports have witnessed a sustained upward trend, growing from 47% of total services exports in 2005 to 62.9% in 2019, just before the COVID-19 pandemic. Despite the overall decrease in the value of services trade as a result of COVID-19 in 2020, the share of digitally deliverable exports rose. This sustained growth was fuelled by exports of *computer services* (growing from USD 80 million in 2005 to USD 1.99 billion in 2019 and to 2.07 billion in 2020, despite COVID-19) and *professional and management consulting services* (from USD 500 million in 2005 to USD 4.38 billion in 2019, and USD 3.98 billion in 2020).

## Figure 2.20. Digitally deliverable services and business services occupy an important share of total services exports and imports in Brazil

a. Exports



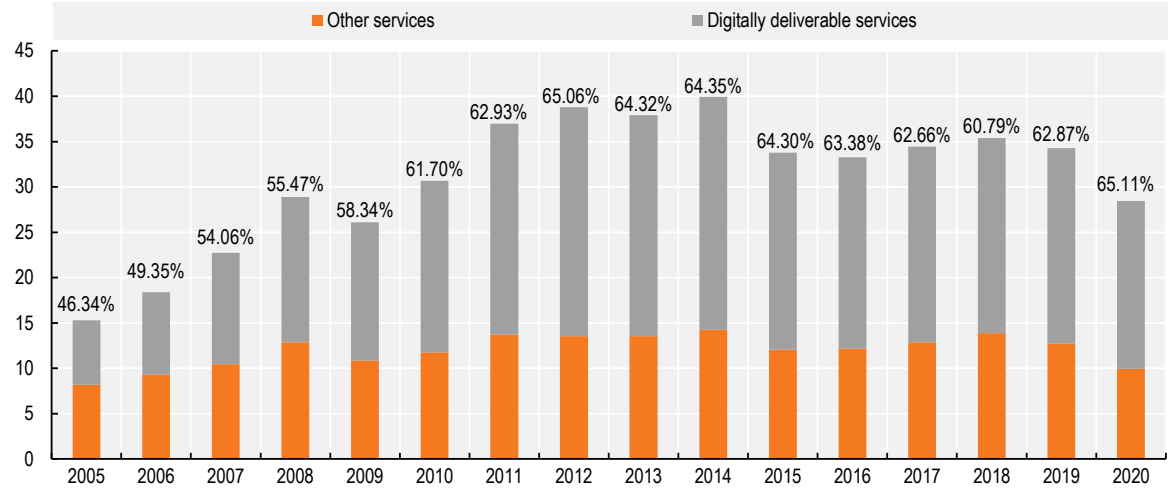

b. Imports



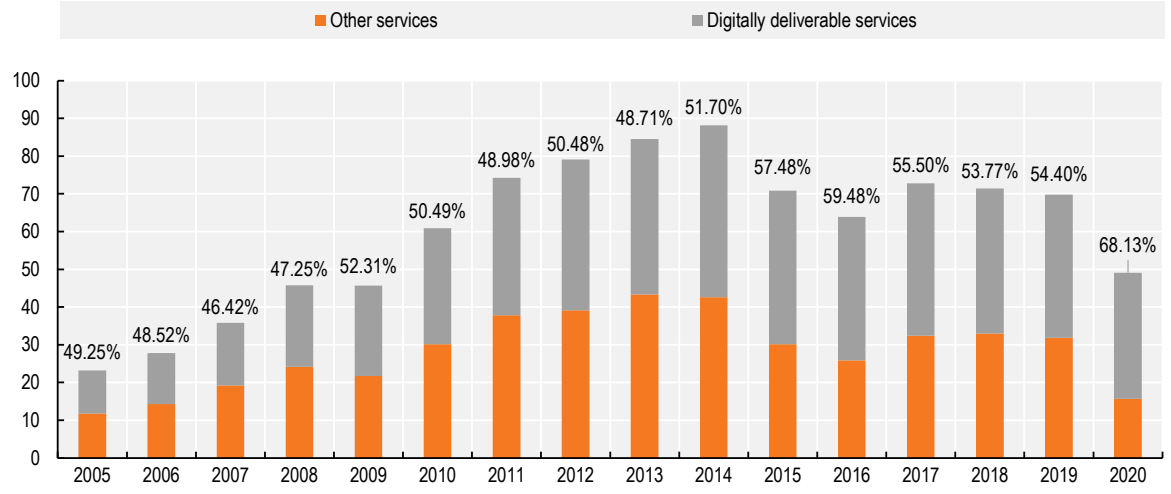

Note: Digitally deliverable services are defined using the Digital Trade handbook definition (OECD-WTO-IMF, 2020[1]) – corresponding to UNCTAD's ICT-enabled services definition, as platform services and mode 1 travel services could not be separately identified in the available Balance of Payments (BoP) data. Due to unequal coverage in sector aggregation across countries and to facilitate cross-country comparison, digitally deliverable services are distinguished in broader sector categories in EBOPS. Relative to the handbook definition, this leads to the inclusion of EBOPS 10.3.2 (Waste treatment and de-pollution, agricultural and mining services), 10.3.3 (Operating leasing services), 10.3.4 (Trade-related services) and EBOPS 11.2.4 ('other personal services), in the list of digitally deliverable services. Data on Construction services (in 'other services') is missing for Mexico. The OECD aggregation is based on the simple average of 'digitally deliverable services' and 'other services' shares at the country level. In this aggregation, beyond missing data for Construction services in Mexico, data for Goods-related services, Construction services, and Government goods and services (n.i.e.) is missing for Chile.
Source: UNCTADstat Balance of Payments statistics, year 2018.

## Figure 2.21. Digitally deliverable services occupy an important share in Brazil's services imports and exports, USD billion

a. Exports




b. Imports

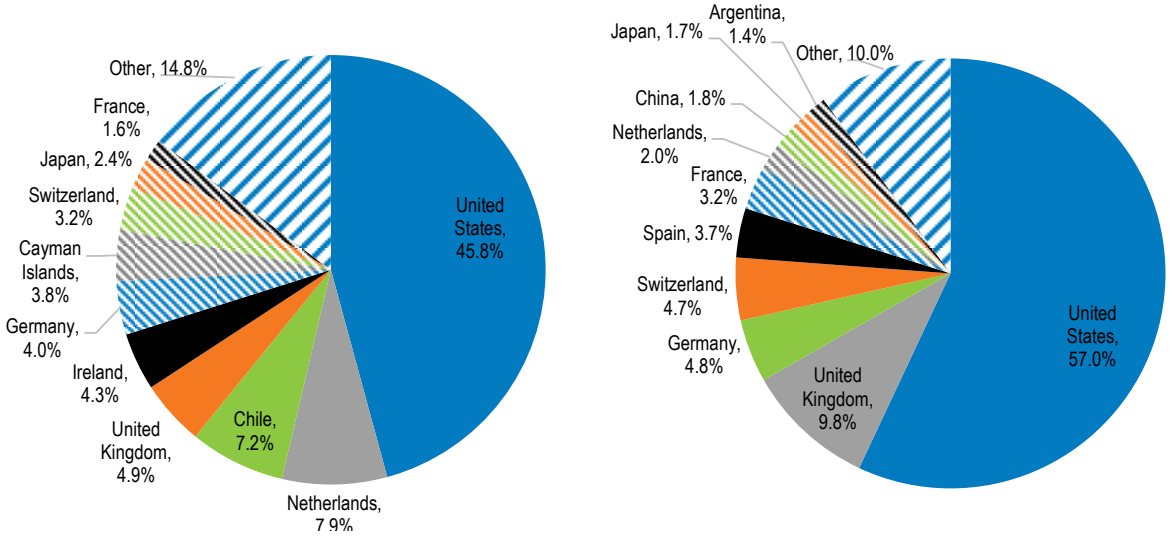



Note: Due to data availability constraints, digitally deliverable services includes EBOPS 10.3.2 (Waste treatment and de-pollution, agricultural and mining services), 10.3.3 (Operating leasing services) and 10.3.4 (Trade-related services), as these could not be individually separated in BoP statistics for Brazil. It includes other personal services (EBOPS 11.2.4) due to similar aggregation issues. Data labels show the value of digitally deliverable services trade as a share of total services trade.
Source: UNCTADstat Balance of Payments statistics.

According to firm-level data, the main export destinations for Brazil's digitally deliverable services include the United States (45.8% of total digitally deliverable exports), followed by the Netherlands (7.9%) and Chile (7.2%). The main products exported were professional, technical and business services and information technology services (Figure 2.22). Brazil mostly imports IP and business services from the United States (57.0% of total digitally delivered services imports), services including IT and financial services from the United Kingdom (9.7%), and services including financial and business services from Germany (4.7%).

## Figure 2.22. The United States is the main trade partner of Brazil for services delivered over digital networks, together with OECD countries and regional partners

Exports (left) and imports (right), 2018




Note: The figure is obtained through a correspondence between ICT-enabled services in EBOPS as per OECD-WTO-IMF (2020[1]) and Brazil's NBS classification for trade in services, at the NBS 5-digit level of aggregation.
Source: Authors' calculations based on SISCOSERV.

### *2.4.1. Digitally deliverable services tend to reach larger and more distant markets*

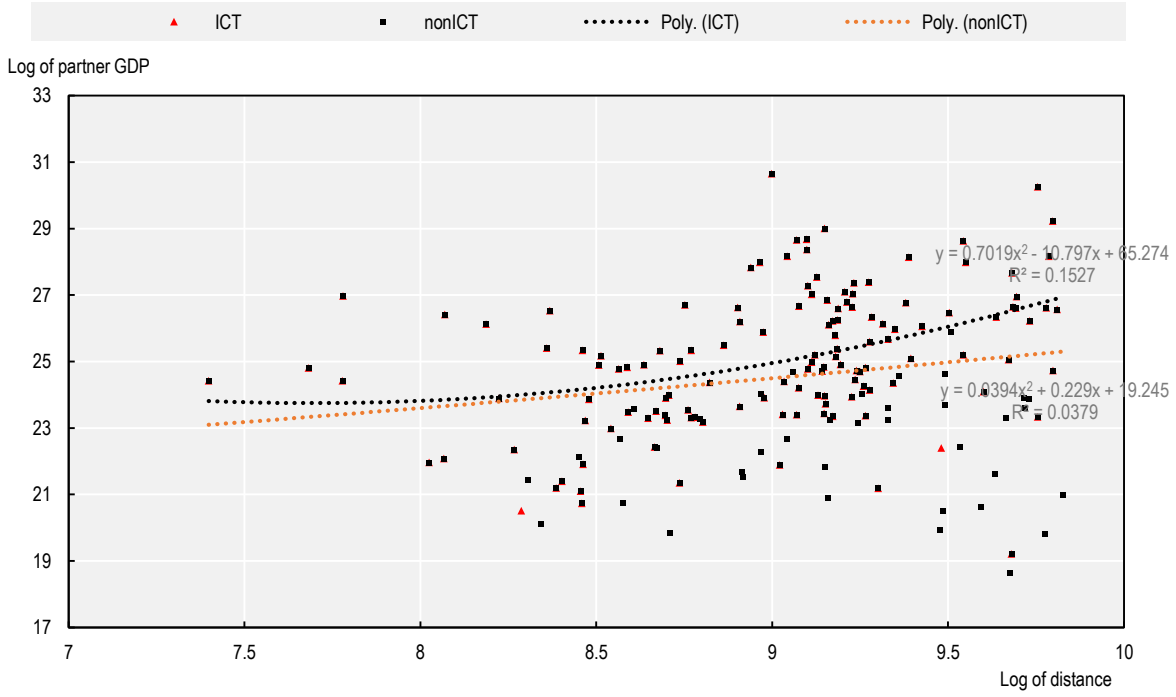
Globally, firms operating in digitally deliverable service sectors tend to export to larger and more distant markets (Figure 2.23). This is likely due to the ability to deliver trade across international borders via digital transfers (Mode 1); see Box 2.3 for a description of the different modes of supply for services.

### Box 2.3. The different modes of service supply

There are four modes of supply for services.

- *Mode 1*, cross-border trade, involves the supply of a service to a customer located abroad (e.g. the provision of cloud services by an IT company in Brazil to a firm in Argentina).
- *Mode 2*, consumption abroad, is where a service is consumed in a foreign country (e.g. a tourist purchasing accommodation services while travelling through Brazil).
- *Mode 3*, commercial presence, occurs when a company based in one country establishes a commercial presence in another to serve the local market (e.g. a Brazilian company sets up a branch in the US to distribute its services). Lastly,
- *Mode 4*, presence of natural persons, is when services providers cross border to supply foreign customers (e.g. a Brazilian engineer goes to Chile to provide consultancy services).

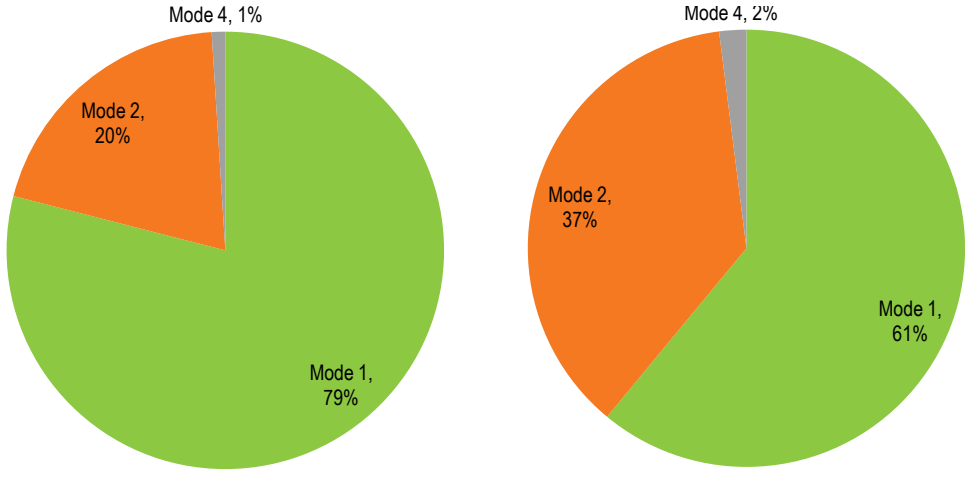
## Figure 2.23. Firms in digitally deliverable sectors export to larger and more distant markets




Note: The figure plots average trade distance of partner country against average GDP of partner country across a number of digitally deliverable services (called here ICT) sectors and non ICT sectors. Points further away from the origin reflect trade with more distant and larger partners while points closer to the origin show more proximous and smaller partners.
Source: OECD calculations on SISCOSERV, CEPII's gravity (distance), WDI database (GDP, current USD).

As might be expected, digitally deliverable services are largely supplied via mode 1. In Brazil, 79% of digitally deliverable services trade are supplied cross-border contrasting with 61% for other services trade (Figure 2.24). Mode 2 still represents 20% of digitally deliverable services while it represents 37% of other services exports. Where mode 4 is concerned, this category of services supply is the smallest across both digitally deliverable and other services.

## Figure 2.24. Brazilian exports by mode of supply and year



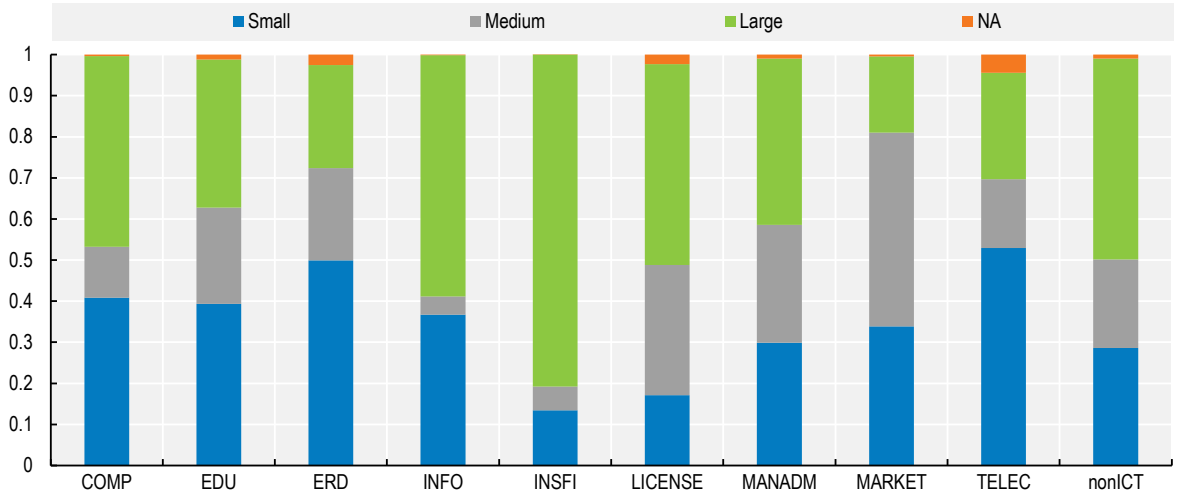

Source: OECD calculations on SISCOSERV.

### *2.4.2. Exporters of digitally deliverable services include a high share of smaller firms*

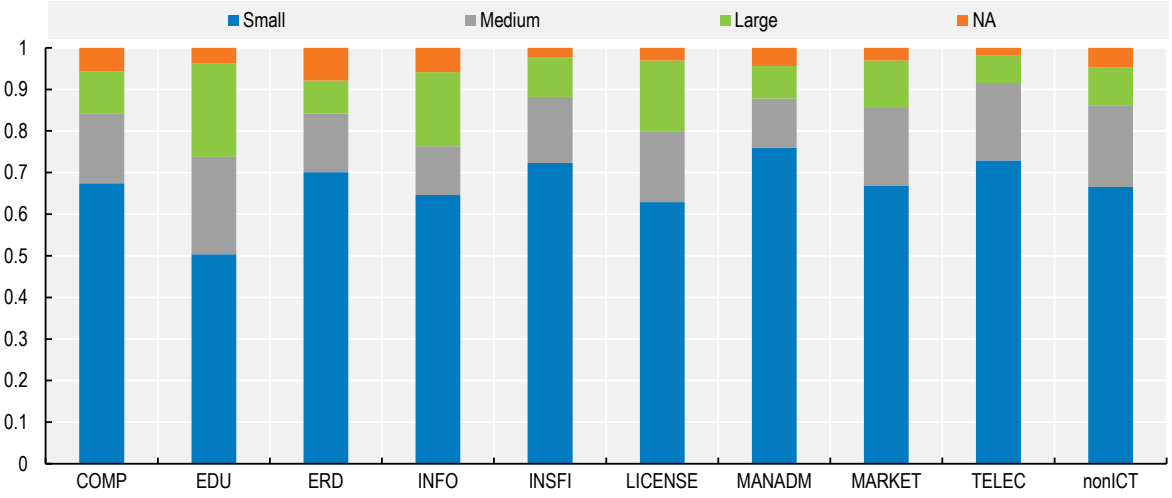
On average, and except for 'information services', 'licences' and 'insurance and finance', over 50% of exports of digitally deliverable services come from SMEs (Figure 2.25). These also represent the highest share of firms operating in digitally deliverable sectors.

## Figure 2.25. Size by category of digitally delivered service, 2018

a. Exports




b. Number of firms

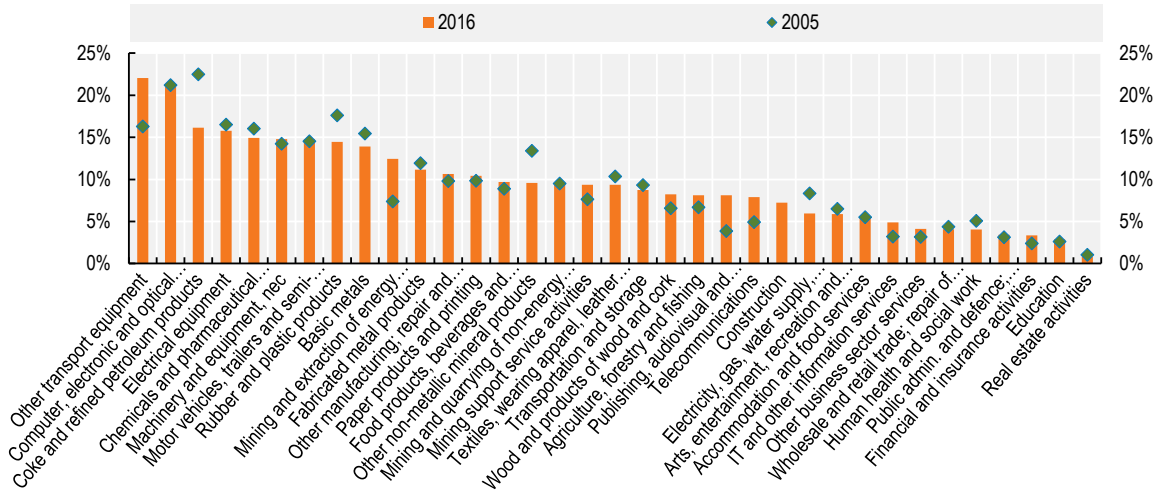



Source: Base de dados do Comércio Exterior Brasileiro.

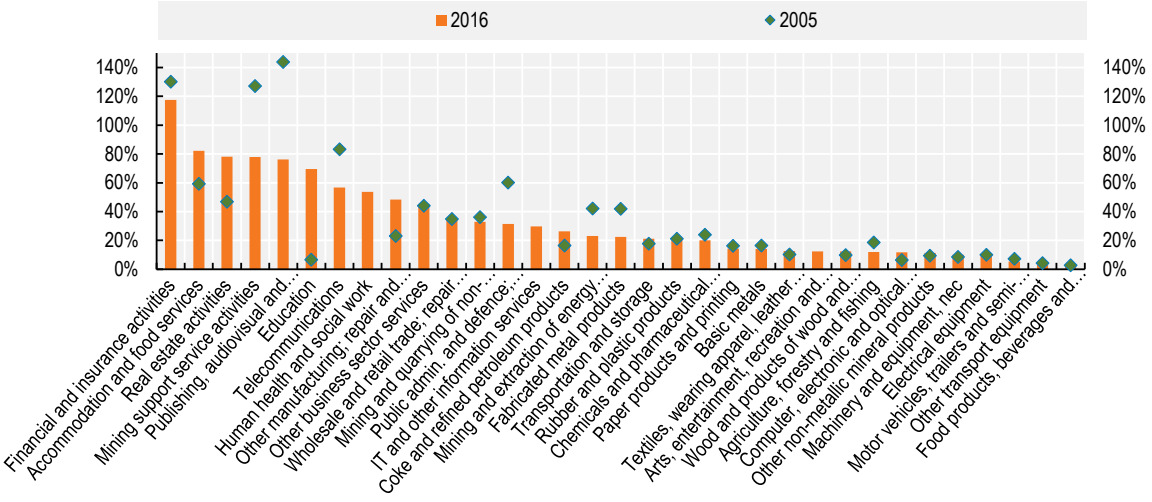
# Annex 2.A. Supporting figures

## Annex Figure 2.A.1. Backward participation and forward participation by sector in Brazil

a. Import content of exports (backward participation)




b. Domestic value added in other country exports (forward participation)




Source: Own calculations from OECD Inter-Country Input-Output Table.

## Annex Table 2.A.1. List of non-tariff measures in MAST

| A | Sanitary and Phytosanitary | B | Technical Barriers to Trade |
|---|---|---|---|
| A1 | Prohibitions/restrictions of imports for SPS reasons | B1 | Prohibitions/restrictions of imports for objectives set out in the TBT agreement |
| A11 | Temporary geographic prohibitions for SPS reasons | B11 | Prohibition for TBT reasons |
| A12 | Geographical restrictions on eligibility | B14 | Authorization requirement for TBT reasons |
| A13 | Systems approach | B15 | Registration requirement for importers for TBT reasons |
| A14 | Special authorization requirement for SPS reasons | B19 | Prohibitions/restrictions of imports for objectives set out in the TBT agreement, n.e.s. |
| A15 | Registration requirements for importers | B2 | Tolerance limits for residues and restricted use of substances |
| A19 | Prohibitions/restrictions of imports for SPS reasons, not elsewhere specified (n.e.s.) | B21 | Tolerance limits for residues of or contamination by certain substances |
| A2 | Tolerance limits for residues and restricted use of substances | B22 | Restricted use of certain substances |
| A21 | Tolerance limits for residues of or contamination by certain (non-microbiological) substances | B3 | Labelling, Marking and Packaging requirements |
| A22 | Restricted use of certain substances in foods and feeds and their contact materials | B31 | Labelling requirements |
| A3 | Labelling, marking and packaging requirements | B32 | Marking requirements |
| A31 | Labelling requirements | B33 | Packaging requirements |
| A32 | Marking requirements | B4 | Production or Post-Production requirements |
| A33 | Packaging requirements | B41 | TBT regulations on production processes |
| A4 | Hygienic requirements | B42 | TBT regulations on transport and storage |
| A41 | Microbiological criteria of the Final product | B49 | Production or post-production requirements, n.e.s. |
| A42 | Hygienic practices during production | B6 | Product identity requirement |
| A49 | Hygienic requirements, n.e.s. | B7 | Product quality or performance requirement |
| A5 | Treatment for elimination of plant and animal pests and disease-causing organisms in the final product (e.g. Post-harvest treatment) | B8 | Conformity assessment related to TBT |
| A51 | Cold/heat treatment | B81 | Product registration requirement |
| A52 | Irradiation | B82 | Testing requirement |
| A53 | Fumigation | B83 | Certification requirement |
| A59 | Treatment for elimination of plant and animal pests and disease-causing organisms in the (nal product, n.e.s. | B84 | Inspection requirement |
| A6 | Other requirements on production or post-production processes | B85 | Traceability information requirements |
| A61 | Plant-growth processes | *B851* | Origin of materials and parts |
| A62 | Animal-raising or -catching processes | *B852* | Processing history |
| A63 | Food and feed processing | *B853* | Distribution and location of products after delivery |
| A64 | Storage and transport conditions | *B859* | Traceability requirements, n.e.s. |
| A69 | Other requirements on production or post-production processes, n.e.s | B89 | Conformity assessment related to TBT, n.e.s. |
| A8 | Conformity assessment related to SPS | B9 | TBT Measures n.e.s. |
| A81 | Product registration requirement | | |
| A82 | Testing requirement | **C** | **Border control measures** |
| A83 | Certification requirement | C1 | Pre-shipment inspection |
| A84 | Inspection requirement | C2 | Direct consignment requirement |
| A85 | Traceability requirements | C3 | Requirement to pass through specified port of customs |
| *A851* | Origin of materials and parts | C4 | Import monitoring and surveillance requirements and other automatic licensing measures |
| *A852* | Processing history | C9 | Other formalities, n.e.s. |
| *A853* | Distribution and location of products after delivery | E3 | Prohibitions other than for SPS and TBT reasons |
| *A859* | Traceability requirements, n.e.s. | E31 | Prohibition for economic reasons |
| A86 | Quarantine requirement | *E311* | Full prohibition (import ban) |
| A89 | Conformity assessment related to SPS, n.e.s. | *E312* | Seasonal prohibition |
| A9 | SPS measures n.e.s. | *E313* | Temporary prohibition, including suspension of issuance of licences |

| E | Quantity control measures | *E314* | Prohibition of importation in bulk |
|---|---|---|---|
| E1 | Non-automatic import licensing procedures other than authorizations for SPS or TBT reasons | *E315* | Prohibition of products infringing patents or other intellectual property rights |
| E11 | Licensing for economic reasons | *E316* | Prohibition of used, repaired or remanufactured goods |
| *E111* | Licensing procedure with no specific ex ante criteria | *E319* | Prohibition for economic reasons, n.e.s. |
| *E112* | Licensing for specified use | E32 | Prohibition for non-economic reasons |
| *E113* | Licensing linked with local production | *E321* | Prohibition for religious, moral or cultural reasons |
| *E119* | Licensing for economic reasons, n.e.s. | *E322* | Prohibition for political reasons (embargo) |
| E12 | Licensing for non-economic reasons | *E329* | Prohibition for non-economic reasons, n.e.s. |
| E2 | Quotas | E5 | Export restraint arrangement |
| E21 | Permanent | E51 | Voluntary export-restraint arrangements (VERs) |
| *E211* | Global allocation | *E511* | Quota agreement |
| *E212* | Country allocation | *E512* | Consultation agreement |
| E22 | Seasonal quotas | *E513* | Administrative cooperation agreement |
| *E221* | Global allocation | E6 | Tariff Rate Quotas |
| *E222* | Country allocation | E61 | WTO-bound TRQs, included in WTO schedules (concessions and commitments under WTO negotiations) |
| E23 | Temporary | E62 | Other TRQs included in other trade agreements. |
| *E231* | Global allocation | *E621* | Global allocation |
| *E232* | Country allocation | *E622* | Country allocation |
| | | E9 | Quantity control measures n.e.s. |

Source: UNCTAD (2012[15]).

## Annex Table 2.A.2. List on NTMs applying to ICT goods according to the TRAINS NTM database

Partner affected by the NTM=World

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
|---|---|---|---|---|
| A83 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº 23 de 14/07/2011 y sus modificaciones. |
| B14 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº 23 de 14/07/2011 y sus modificaciones. |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
|---|---|---|---|---|
| B14 | Licencia Previa de Importación emitida por el Comando del Ejército. La autorización es concedida por medio de Certificado Internacional de Importación. La importación solamente se autorizará para los órganos de seguridad pública y para coleccionadores, tiradores y cazadores en las condiciones establecidas en normas específicas (art. 51). La Ley Nº 10826/03 en su art. 3º establece que es obligatorio el registro de armas de fuego de uso restringido en el Comando del Ejército. | 400251,590390,591140,6113,621133(Unicamente los productos indicados en la norma.),621143(Unicamente los productos indicados en la norma.),630190(Unicamente los productos indicados en la norma.),650610(Unicamente los productos indicados en la norma.),7007(Unicamente los productos indicados en la norma.),760320(Unicamente los productos indicados en la norma.),810430(Unicamente los productos indicados en la norma.),810490(Unicamente los productos indicados en la norma.),820559(Unicamente los productos indicados en la norma.),841210(Unicamente los productos indicados en la norma.),846229(Unicamente los productos indicados en la norma.),851440(Unicamente los productos indicados en la norma.),852610(Unicamente los productos indicados en la norma.),870321(Unicamente los productos indicados en la norma.),870322(Unicamente los productos indicados en la norma.),870323(Unicamente los productos indicados en la norma.),870324(Unicamente los productos indicados en la norma.),870331(Unicamente los productos indicados en la norma.),870332(Unicamente los productos indicados en la norma.),870333(Unicamente los productos indicados en la norma.),870390(Unicamente los productos indicados en la norma.),870710(Unicamente los productos indicados en la norma.),870821(Unicamente los productos indicados en la norma.),8710,900410,900510,900580,9013,9301,9302,9303,9304,9305,9306 | | Decreto Nº 5123 de 1/VII/04. |
| B31 | Requisitos de Evaluación de la Conformidad. Requisitos de etiquetado. | 841919,841990,850720,853710,854140,900190,900290,903289 | | Portaria Nº 004 de 4/I/11. INMETRO. |
| B31 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº 23 de 14/07/2011 y sus modificaciones. |
| B7 | Requisitos de seguridad y protección exigidas por la Oficina Internacional del Trabajo (art. 1º). La declaración será proporcionada si el cargador vendedor o fabricante del equipo presenta a los | Exclusivamente los que por su peligrosidad inhere: 840110,840120,840130,840211,840212,840219,840220,840310,840410,840420,840510,840610,840681,840682,840721,840729,840790,840810,840890,841011,841012,841013,841111,841112,841121,841122,841181,841182,841221,841229,841231,841239,841311,841319,841340,841350,841360,841370,841381,841382 | | Decreto Nº 62465 de 26/03/1968. Reglamento de |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
|---|---|---|---|---|
| | órganos consulares certificado de la autoridad local competente en materia de seguridad del trabajo. Solo se autorizará el despacho de las mercancías si en la factura de embarque consta la declaración consular del cumplimiento de este requisito (art. 2). Ver disposiciones de la Ley 5280/67 al final del texto. | ,841410,841420,841430,841440,841610,841620,841630,841710,841861,841931,841932,841939,841940,841950,841960,841981,841989,842010,842111,842119,842121,842122,842123,842131,842219,842220,842330,842382,842389,842430,842482,842489,8425,8426,8427,8428,842911,842919,842920,842930,842940,842951,842959,8430,843210,843221,843229,843231,843239,843241,843242,843280,843311,843319,843320,843330,843340,843351,843352,843353,843359,843410,843420,843510,843610,843621,843629,843680,843710,843780,843810,843820,843830,843840,843850,843860,843880,843910,843920,843930,844110,844120,844130,844140,844180,844311,844312,844313,844314,844315,844316,844317,844319,844331,844339,844391,844399,8444,8445,8446,8447,844811,844819,845020,845110,845130,845140,845150,845180,845221,845310,845320,845390,845410,845430,845510,845521,845522,845611,845612,845620,845630,8457,8458,8459,8460,8461,8462,8463,846410,846490,846510,846591,846592,846593,846594,846595,846596,846599,846711,846719,846721,846722,846729,846781,846789,846810,846820,846880,847410,847420,847431,847432,847439,847480,847510,847521,847529,847710,847720,847730,847740,847751,847759,847810,847910,847920,847930,847940,847950,847960,847981,847982,848340,850131,850132,850133,850134,850140,850151,850152,850161,850162,850163,850164,8502,850421,850422,850423,850432,850433,850434,851440,854330,8604,870510 | | la Ley 5280/67. |
| B81 | Licencia Previa de Importación emitida por el Comando del Ejército. La autorización es concedida por medio de Certificado Internacional de Importación. La importación solamente se autorizará para los órganos de seguridad pública y para coleccionadores, tiradores y cazadores en las condiciones establecidas en normas específicas (art. 51). La Ley Nº 10826/03 en su art. 3º establece que es obligatorio el registro de armas de fuego de uso restringido en el Comando del Ejército. | 400251,590390,591140,6113,621133(Unicamente los productos indicados en la norma.),621143(Unicamente los productos indicados en la norma.),630190(Unicamente los productos indicados en la norma.),650610(Unicamente los productos indicados en la norma.),7007(Unicamente los productos indicados en la norma.),760320(Unicamente los productos indicados en la norma.),810430(Unicamente los productos indicados en la norma.),810490(Unicamente los productos indicados en la norma.),820559(Unicamente los productos indicados en la norma.),841210(Unicamente los productos indicados en la norma.),846229(Unicamente los productos indicados en la norma.),851440(Unicamente los productos indicados en la norma.),852610(Unicamente los productos indicados en la norma.),870321(Unicamente los productos indicados en la norma.),870322(Unicamente los productos indicados en la norma.),870323(Unicamente los productos indicados en la norma.),870324(Unicamente los productos indicados en la norma.),870331(Unicamente los productos indicados en la norma.),870332(Unicamente los productos indicados en la norma.),870333(Unicamente los productos indicados en la norma.),870390(Unicamente los productos indicados en la norma.),870710(Unicamente los productos indicados en la norma.),870821(Unicamente los productos indicados en la norma.),8710,900410,900510,900580,9013,9301,9302,9303,9304,9305,9306 | | Decreto Nº 5123 de 1/VII/04. |
| B81 | Registro del producto en la Secretaría Especial de Informática (art. 12). Ver excepciones en el artículo 14. | 852352,852359,852380 | | Decreto Nº 96036 de 12/05/1988. Reglamento de la Ley Nº 7646, de 18/12/1987, implementado |

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| | | | | por Decreto Nº 1207 de 01/08/1994. |
| B83 | Requisitos de seguridad y protección exigidas por la Oficina Internacional del Trabajo (art. 1º). La declaración será proporcionada si el cargador vendedor o fabricante del equipo presenta a los órganos consulares certificado de la autoridad local competente en materia de seguridad del trabajo. Solo se autorizará el despacho de las mercancías si en la factura de embarque consta la declaración consular del cumplimiento de este requisito (art. 2º). Ver disposiciones de la Ley 5280/67 al final del texto. | Exclusivamente los que por su peligrosidad inhere: 840110,840120,840130,840211,840212,840219,840220,840310,840410,840420,840510,840610,840681,840682,840721,840729,840790,840810,840890,841011,841012,841013,841111,841112,841121,841122,841181,841182,841221,841229,841231,841239,841311,841319,841340,841350,841360,841370,841381,841382,841410,841420,841430,841440,841610,841620,841630,841710,841861,841931,841932,841939,841940,841950,841960,841981,841989,842010,842111,842119,842121,842122,842123,842131,842219,842220,842330,842382,842389,842430,842482,842489,8425,8426,8427,8428,842911,842919,842920,842930,842940,842951,842959,8430,843210,843221,843229,843231,843239,843241,843242,843280,843311,843319,843320,843330,843340,843351,843352,843353,843359,843410,843420,843510,843610,843621,843629,843680,843710,843780,843810,843820,843830,843840,843850,843860,843880,843910,843920,843930,844110,844120,844130,844140,844180,844311,844312,844313,844314,844315,844316,844317,844319,844331,844339,844391,844399,8444,8445,8446,8447,844811,844819,845020,845110,845130,845140,845150,845180,845221,845310,845320,845390,845410,845430,845510,845521,845522,845611,845612,845620,845630,8457,8458,8459,8460,8461,8462,8463,846410,846490,846510,846591,846592,846593,846594,846595,846596,846599,846711,846719,846721,846722,846729,846781,846789,846810,846820,846880,847410,847420,847431,847432,847439,847480,847510,847521,847529,847710,847720,847730,847740,847751,847759,847810,847910,847920,847930,847940,847950,847960,847981,847982,848340,850131,850132,850133,850134,850140,850151,850152,850161,850162,850163,850164,8502,850421,850422,850423,850432,850433,850434,851440,854330,8604,870510 | | Decreto Nº 62465 de 26/03/1968. Reglamento de la Ley 5280/67. |
| B83 | Certificación Obligatoria en el ámbito del Sistema Brasileño de Evaluación de la Conformidad - SBAC (art. 3º). La fiscalización del cumplimiento de esta norma es competencia del INMETRO (art. 10). La Portaria Nº 108/05 aprobó la Certificación Obligatoria en el ámbito de la Resolución GMC Nº 23/04. | 9503,9504,960330,960810,960820,960910(Exclusivamente para niños),960990(Exclusivamente para niños),9610(Exclusivamente para niños),9611(Exclusivamente para niños) | | Portaria Nº 321 de 29/X/09. INMETRO. Modificada por la Portaria Nº 152/2010. Modificada por Portaria Nº 117/11. |
| B83 | Reglamento de Evaluación de la Conformidad. Certificación obligatoria en el marco del Sistema Brasileño de Evaluación de la Conformidad - SBAC concedida por organismo acreditado (arts. 3º, 4º). Se exceptúan los equipos instalados en unidades marítimas fabricadas en el exterior e importadas, destinadas a producción de petróleo o al transporte | 761699(Exclusivamente para instalaciones eléctricas en a...),841311(Exclusivamente eléctricos para operación en atmós...),841319(Exclusivamente eléctricos para operación en atmós...),841360(Exclusivamente eléctricos para operación en atmós...),841370(Exclusivamente eléctricos para operación en atmós...),841381(Exclusivamente eléctricos para operación en atmós...),841382(Exclusivamente eléctricos para operación en atmós...),841410(Exclusivamente eléctricos para operación en atmós...),842511(Exclusivamente para operación en atmósferas explo...),842531(Exclusivamente para operación en atmósferas explo...),842539,842611(Exclusivamente | | Portaria Nº 179 de 18/V/10. INMETRO. |

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| | de productos inflamables, para trabajo "off shore" (art. 5º). | eléctricos para operación en atmós...),842612(Exclusivamente eléctricos para operación en atmós...),842619(Exclusivamente eléctricos para operación en atmós...),842620(Exclusivamente eléctricos para operación en atmós...),842630(Exclusivamente eléctricos para operación en atmós...),842641(Exclusivamente eléctricos para operación en atmós...),842649(Exclusivamente eléctricos para operación en atmós...),842699(Exclusivamente eléctricos para operación en atmós...),850110(Exclusivamente para operación en atmósferas explo...),850120(Exclusivamente para operación en atmósferas explo...),850131(Exclusivamente para operación en atmósferas explo...),850132(Exclusivamente para operación en atmósferas explo...),850133(Exclusivamente para operación en atmósferas explo...),850134(Exclusivamente para operación en atmósferas explo...),850140(Exclusivamente para operación en atmósferas explo...),850151(Exclusivamente para operación en atmósferas explo...),850152(Exclusivamente para operación en atmósferas explo...),850161(Exclusivamente para operación en atmósferas explo...),850162(Exclusivamente para operación en atmósferas explo...),850163(Exclusivamente para operación en atmósferas explo...),850164(Exclusivamente para operación en atmósferas explo...),8502(Exclusivamente para operación en atmósferas explo...),8503,850410(Exclusivamente para operación en atmósferas explo...),850421(Exclusivamente para operación en atmósferas explo...),850422(Exclusivamente para operación en atmósferas explo...),850423(Exclusivamente para operación en atmósferas explo...),850431(Exclusivamente para operación en atmósferas explo...),850432(Exclusivamente para operación en atmósferas explo...),850433(Exclusivamente para operación en atmósferas explo...),850434(Exclusivamente para operación en atmósferas explo...),850450(Exclusivamente para operación en atmósferas explo...),850520(Exclusivamente para operación en atmósferas explo...),850710(Exclusivamente para operación en atmósferas explo...),850720(Exclusivamente para operación en atmósferas explo...),850730(Exclusivamente para operación en atmósferas explo...),850740(Exclusivamente para operación en atmósferas explo...),850750(Exclusivamente para operación en atmósferas explo...),850760(Exclusivamente para operación en atmósferas explo...),850780(Exclusivamente para operación en atmósferas explo...),851440(Exclusivamente para operación en atmósferas explo...),853110(Exclusivamente para operación en atmósferas explo...),853120(Exclusivamente para operación en atmósferas explo...),853180(Exclusivamente para operación en atmósferas explo...),853210(Exclusivamente para operación en atmósferas explo...),853510(Exclusivamente para operación en atmósferas explo...),853521(Exclusivamente para operación en atmósferas explo...),853529(Exclusivamente para operación en atmósferas explo...),853540(Exclusivamente para operación en atmósferas explo...),853590(Exclusivamente para operación en atmósferas explo...),853610(Exclusivamente para operación en atmósferas explo...),853620(Exclusivamente para operación en atmósferas explo...),853630(Exclusivamente para operación en atmósferas explo...),853641(Exclusivamente para operación en atmósferas explo...),853649(Exclusivamente para operación en atmósferas explo...),853650(Exclusivamente para operación en atmósferas explo...),853661(Exclusivamente para operación en atmósferas explo...),853669(Exclusivamente para operación en atmósferas explo...),853710(Exclusivamente para | | |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
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| | | operación en atmósferas explo...),853720,853810(Exclusivamente para operación en atmósferas explo...),853910(Exclusivamente para operación en atmósferas explo...),854442,854449(Exclusivamente para operación en atmósferas explo...),854460(Exclusivamente para operación en atmósferas explo...),8546(Exclusivamente para operación en atmósferas explo...),8547(Exclusivamente para operación en atmósferas explo...),8601(Exclusivamente para operación en atmósferas explo...),860210,860310(Exclusivamente para operación en atmósferas explo...),902620(Exclusivamente eléctricos para operación en atmós...),902680(Exclusivamente eléctricos para operación en atmós...),902810(Exclusivamente eléctricos para operación en atmós...),902820(Exclusivamente eléctricos para operación en atmós...),902830(Exclusivamente para operación en atmósferas explo...),902910(Exclusivamente eléctricos para operación en atmós...),902920(Exclusivamente eléctricos para operación en atmós...),903031(Exclusivamente para operación en atmósferas explo...),903032,903033,903210(Exclusivamente eléctricos para operación en atmós...),903220(Exclusivamente eléctricos para operación en atmós...),910521(Exclusivamente para operación en atmósferas explo...),910591(Exclusivamente para operación en atmósferas explo...),940540(Exclusivamente para operación en atmósferas explo...) | | |
| B83 | Requisito de certificación. | 9503,9504 | | Portaria Nº108 de 13/06/2005. INMETRO. |
| B83 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº23 de 14/07/2011 y sus modificaciones. |
| B9 | Requisitos de seguridad y protección exigidas por la Oficina Internacional del Trabajo (art. 1º). La declaración será proporcionada si el cargador vendedor o fabricante del equipo presenta a los | Exclusivamente los que por su peligrosidad inhere: 840110,840120,840130,840211,840212,840219,840220,840310,840410,840420,840510,840610,840681,840682,840721,840729,840790,840810,840890,841011,841012,841013,841111,841112,841121,841122,841181,841182,841221,841229,841231,841239,841311,841319,841340,841350,841360,841370,841381,841382 | | Decreto Nº 62465 de 26/03/1968. Reglamento de |

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| | órganos consulares certificado de la autoridad local competente en materia de seguridad del trabajo. Solo se autorizará el despacho de las mercancías si en la factura de embarque consta la declaración consular del cumplimiento de este requisito (art. 2º). Ver disposiciones de la Ley 5280/67 al final del texto. | ,841410,841420,841430,841440,841610,841620,841630,841710,841861,841931,841932,841939,841940,841950,841960,841981,841989,842010,842111,842119,842121,842122,842123,842131,842219,842220,842330,842382,842389,842430,842482,842489,8425,8426,8427,8428,842911,842919,842920,842930,842940,842951,842959,8430,843210,843221,843229,843231,843239,843241,843242,843280,843311,843319,843320,843330,843340,843351,843352,843353,843359,843410,843420,843510,843610,843621,843629,843680,843710,843780,843810,843820,843830,843840,843850,843860,843880,843910,843920,843930,844110,844120,844130,844140,844180,844311,844312,844313,844314,844315,844316,844317,844319,844331,844339,844391,844399,8444,8445,8446,8447,844811,844819,845020,845110,845130,845140,845150,845180,845221,845310,845320,845390,845410,845430,845510,845521,845522,845611,845612,845620,845630,8457,8458,8459,8460,8461,8462,8463,846410,846490,846510,846591,846592,846593,846594,846595,846596,846599,846711,846719,846721,846722,846729,846781,846789,846810,846820,846880,847410,847420,847431,847432,847439,847480,847510,847521,847529,847710,847720,847730,847740,847751,847759,847810,847910,847920,847930,847940,847950,847960,847981,847982,848340,850131,850132,850133,850134,850140,850151,850152,850161,850162,850163,850164,8502,850421,850422,850423,850432,850433,850434,851440,854330,8604,870510 | | la Ley 5280/67. |
| B9 | Requisitos de Evaluación de la Conformidad. Requisitos de etiquetado. | 841919,841990,850720,853710,854140,900190,900290,903289 | | Portaria Nº004 de 4/I/11. INMETRO. |
| C4 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº23 de 14/07/2011 y sus modificaciones. |
| D12 | Establece derechos antidumping. | 851821,851822 | | Circular Nº 63 de 14/09/2006. Modificada por la Resolución Nº |

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| | | | | 25/2007, Nº 101/2013 y Circular Nº 42/2016. CAMEX. |
| E111 | Licencia no automática de importación emitida por la Secretaría de Comercio Exterior (SECEX). Se permite la importación de estos bienes siempre que cumplan acumulativamente con los requisitos establecidos especificamente en esta norma y no se produzcan en el país. Para la realización del análisis de producción nacional la SECEX publicará periodicamente por medio de Consulta Pública, las solicitudes de importación (art. 22). Se exceptúan de estos requisitos las importaciones al amparo de acuerdos internacionales; productos del sector aeronáutico; sectores naútica y naval; productos de los sectores de informática y comunicaciones con las condiciones establecidas (art. 25). | 850110(Usados),850120(Usados),850131(Usados),850132(Usados),850133(Usados),850134(Usados),850140(Usados),850151(Usados),850152(Usados),850161(Usados),850162(Usados),850163(Usados),850164(Usados),8502(Usados),8503(Usados),8504(Usados),8505(Usados),8506(Usados),8507(Usados),8508(Usados),8509(Usados),8510(Usados),8511(Usados),8512(Usados),8513(Usados),8514(Usados),8515(Usados),8516(Usados),8517(Usados),8518(Usados),8519(Usados),8521(Usados),8522(Usados),8523(Usados),8525(Usados),8526(Usados),8527(Usados),8528(Usados),8529(Usados),8530(Usados),8531(Usados),8532(Usados),8533(Usados),8534(Usados),8535(Usados),8536(Usados),8537(Usados),8538(Usados),853910(Usados),853921(Usados),853922(Usados),853929(Usados),853931(Usados),853932(Usados),853939(Usados),853941(Usados),853949(Usados),853990(Usados),8540(Usados),8541(Usados),8542(Usados),8543(Usados),8544(Usados),8545(Usados),8546(Usados),8547(Usados),8548(Usados),86(Usados),8701(Usados),8702(Usados),870310(Usados),870321(Usados),870322(Usados),870323(Usados),870324(Usados),870331(Usados),870332(Usados),870333(Usados),870390(Usados),8704(Usados),8705(Usados),8706(Usados),8707(Usados),8708(Usados),8709(Usados),8710(Usados),871110(Usados),871120(Usados),871130(Usados),871140(Usados),871150(Usados),871190(Usados),8712(Usados),8713(Usados),8714(Usados),8715(Usados),8716(Usados) | | Portaria Nº 08 de 13/05/1991 y sus modificaciones. DECEX |
| E111 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº 23 de 14/07/2011 y sus modificaciones. |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
|---|---|---|---|---|
| E325 | Prohibicion de importacion (art. 1 y 2). | 8413,8414,8415,8418,8419,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8445,8450,8451,8452,8470,8471,8472,8479,8508,8509,8510,8513,8516,8519,8521,8527,8528,8531,8542,9405 | | Portaria Nº 10 de 25/1/2010. Modificada por Portaria Nº 562 de 23/12/2014. INMETRO. |
| E325 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (Art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº 23 de 14/07/2011 y sus modificaciones. |
| E611 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº 23 de 14/07/2011 y sus modificaciones. |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
|---|---|---|---|---|
| P19 | Programa de Financiación de las Exportaciones (PROEX). que tiene como objetivo ofrecer acceso al crédito en condiciones preferenciales a las empresas exportadoras de bienes y servicios. El Programa es administrado por el Banco do Brasil. | 0102,0201,0202,0203,0204,0205,0206,0207,0208,0209,021011,021019,021020,021091,021092,021093,021099,0301,030211,030213,030214,030219,030221,030222,030223,030224,030229,030231,030232,030233,030234,030235,030236,030239,030241,030242,030243,030244,030245,030246,030247,030251,030252,030253,030254,030255,030256,030259,030271,030272,030273,030274,030279,030281,030282,030283,030284,030285,030289,030291,030292,030299,030311,030312,030313,030314,030319,030323,030324,030325,030326,030329,030331,030332,030333,030334,030339,030341,030342,030343,030344,030345,030346,030349,030351,030353,030354,030355,030356,030357,030363,030364,030365,030366,030367,030368,030369,030381,030382,030383,030384,030389,030391,030392,030399,030431,030432,030433,030439,030441,030442,030443,030444,030445,030446,030449,030451,030452,030453,030454,030455,030459,030461,030462,030463,030469,030471,030472,030473,030474,030475,030479,030481,030482,030483,030484,030485,030486,030487,030488,030489,030491,030492,030493,030494,030495,030499,0305,030611,030612,030614,030615,030616,030617,030619,030631,030632,030633,030634,030635,030636,030639,030711,030719,030721,030729,030731,030739,030742,030743,030749,030751,030752,030759,030760,030771,030779,030781,030782,030783,030784,030787,030788,030791,030799,030811,030819,030821,030829,030830,030890,04,0504,051110,06,07,08,090121,090122,090190,0902,0903,0904,0905,0906,0907,0908,0909,0910,10,11,1202,1203,1204,1205,1206,1207,1208,1209,1210,121120,121130,121140,121190,1212,1213,1214,1301,130211,130212,130213,130219,130220,130231,130232,130239,15,1601,1602,1603,160411,160412,160413,160414,160415,160416,160417,160419,160420,160431,160432,1605,1704,180620,180631,180632,180690,19,2001,2002,2003,2004,2005,2006,200710,200791,2008,2009,21,2201,220210,2203,2204,2205,2206,2208,2209,23,240120,240210,240311,240319,270220,2710,2711,2713,28,2901,2902,290311,290312,290313,290314,290315,290319,290321,290322,290323,290329,290331,290339,290371,290372,290373,290374,290375,290376,290377,290378,290379,290381,290382,290383,290389,290391,290392,290399,290410,290420,290491,290499,2905,2906,2907,2908,2909,291010,291020,291030,291040,291090,2911,2912,2913,291411,291412,291413,291419,291422,291423,291429,291431,291439,291440,291450,291461,291469,291471,291479,2915,2916,2917,291811,291812,291813,291814,291815,291816,291818,291819,291821,291822,291823,291829,291830,291891,291899,2919,292011,292019,292021,292022,292023,292024,292029,292090,292111,292119,292121,292122,292129,292130,292141,292142,292143,292144,292145,292146,292149,292151,292159,2922,292310,292320,292390,292411,292412,292419,292421,292423,292424,292429,2925,292610,292620,292630,292690,2927,2928,2929,293020,293030,293040,293080,293090,2931,293211,293212,293213,293219,293220,293291,293292,293293,293294,293295,293299,293311,293319,293321,293329,293331,293332,293333,293339,293341,293349,293352,293353,293354,293355,293359,293361,293369,293371,293372,293379,293391,293399,2934,293590,2936,2937,2938,293911,293919,293920,293930,293941,293942,293943,293944,293949,293951,293959,293961,293962,293963,293969,293971,293979,2940,2941,2942,3002,300310,300320,300331,300339,300341,300342,300343,300349,300390,300410,300420,300431,300432,300439,300441,300442,300443,300449,300450,300490,3005,3006,31,32,33,34,35,36,37,3801,3802,3804,3805,3806,3807,380852,380859,380891,380892,380893,380894,380899,3809,3810,3811,3812,3813,3814,3815,3816,3817,3818,3819,3820,3821,3822,3823,382410,382430,382440,382450,382460,382471,382472,382473,382474,382475,382476,382477,382478,382479,382481,382482,382483 | | Ley N° 10184 de 12/02/2001. Reglamentado por la Resolución N° 27 de 06/05/2008 y N° 126 de 26/12/2013 |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
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| | | ,382491,382499,3825,3826,390110,390120,390130,390190,3902,3903,3904,3905,3906,3907,3908,3909,3910,3911,3912,3913,3914,3915,3916,3917,3918,3919,3920,3921,3922,3923,3924,3925,3926,4001,4002,4005,4006,4007,4008,4009,4010,4011,4012,4013,4014,4015,4016,4017,41,42,4302,4303,440111,440112,440121,440122,440131,440139,4402,4403,4404,4405,4406,440711,440712,440719,440721,440722,440725,440726,440727,440728,440791,440792,440793,440794,440795,440796,440797,440799,4408,440910,440921,440929,4410,4411,4412,4413,4414,4415,4416,4417,4418,441911,441912,4420,442110,4503,450490,46,47,4802,4803,4804,4805,4806,4807,4808,4809,4810,4811,4812,4813,4814,4816,4817,4818,4819,4820,4821,4822,4823,49,50,51,52,53,5401,540211,540219,540220,540231,540232,540233,540234,540239,540244,540245,540246,540247,540248,540249,540251,540252,540259,540261,540262,540269,5403,5404,5405,5406,5407,5408,5501,5502,5503,5504,5505,550610,550620,550630,550690,5507,5508,5509,551011,551012,5511,5512,5513,5514,5515,5516,56,5701,5702,5703,570410,570490,5705,58,59,60,61,62,6301,6302,6303,630411,630419,630491,630492,630493,630499,6305,6306,6307,6308,6309,6310,64,65,66,6702,6704,68,6901,6902,6903,6904,6905,6906,690721,690722,690723,6909,6910,6911,6912,6913,6914,7002,7003,7004,7005,7006,7007,7008,7009,7010,7011,7013,7014,7015,7016,7017,7018,7019,7020,710391,710399,710490,7113,7114,7115,7116,7117,7118,72,73,7402,7403,7404,7405,7406,7407,7408,7409,7410,7411,7412,7413,7415,7418,7419,7505,7506,7507,7508,7602,7603,7604,7605,7606,7607,7608,7609,7610,7611,7612,7613,7614,7615,7616,7804,7806,7904,7905,7907,8003,8007,810196,810199,810295,810296,810299,810390,810490,810590,810790,810890,810990,811090,811219,811229,811259,811299,8113,82,83,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,845910,845921,845929,845931,845939,845951,845959,845961,845969,845970,846012,846019,846029,846031,846039,846040,846090,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,86,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,870410,870421,870422,870423,870431,870432,8705,8706,8707,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,88,8901,8902,8903,8904,8905,8906,8907,90,91,97 | | |
| P31 | Licencia de importación no automática sin criterios predefinidos (art. 15). Licencia de importación automática (art. 14). Requisito de autorización de importaciones (art. 41, 42). Requisito de certificación (art. 65). Requisito de etiquetado (art. 219). Contingente arancelario de asignación global (Anexo III). Restricción cuantitativa de | 0207,030243,300211(Exclusivamente peptídeo antitumoral.),300212(Exclusivamente peptídeo antitumoral.),300213(Exclusivamente peptídeo antitumoral.),300214(Exclusivamente peptídeo antitumoral.),300215(Exclusivamente peptídeo antitumoral.),300219(Exclusivamente peptídeo antitumoral.),321511,390931(Exclusivamente polimericos en estado líquido.),390939(Exclusivamente polimericos en estado líquido.),401219,82,8401,8402,8403,8404,8405,8406,8407,8408,8409,8410,8411,8412,8413,8414,8415,8416,8417,8418,8419,8420,8421,8422,8423,842410,842420,842430,842482,842489,842490,8425,8426,8427,8 | Secretaría de Comercio Exterior (SECEX) | Portaria Nº23 de 14/07/2011 y sus modificaciones. |

| NTM code | Measure description | HS code | Issuing agency | Regulation title |
|---|---|---|---|---|
| | salvaguardias (Anexo IV). Importación prohibida (art. 66). Exportación prohibida (art. 254). | 428,8429,8430,8431,8432,8433,8434,8435,8436,8437,8438,8439,8440,8441,8442,8443,8444,8445,8446,8447,8448,8449,8450,8451,8452,8453,8454,8455,845611,845612,845620,845630,845690,8457,8458,8459,8460,8461,8462,8463,8464,846510,846591,846592,846593,846594,846595,846596,846599,8466,8467,8468,8470,8471,8472,8473,8474,8475,8476,8477,8478,8479,8480,8481,8482,8483,8484,8486,8487,8501,8502,8503,8504,8505,8506,8507,8508,8509,8510,8511,8512,8513,8514,8515,8516,8517,8518,8519,8521,8522,8523,8525,8526,8527,8528,8529,8530,8531,8532,8533,8534,8535,8536,8537,8538,853910,853921,853922,853929,853931,853932,853939,853941,853949,853990,8540,8541,8542,8543,8544,8545,8546,8547,8548,8701,870210,870290,870310,870321,870322,870323,870324,870331,870332,870333,870390,8704,8705,8706,8707,8708,8709,8710,871110,871120,871130,871140,871150,871190,8712,8713,8714,8715,8716,90,95 | | |

Note: Data extracted in January 2022
Source: TRAINS NTM database.

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## Notes

[1] Efforts are already underway to tackle issues arising from digital divides. Policies supporting greater access in rural areas as well as free-of-charge programmes and tax incentives (*Programa Nacional de Banda Larga*) are underway (OECD, 2020[5]).

[2] Indeed, in recognition to the role of ICT devices, the Federal Government established, in 2005, the *Lei do Bem* (11,196/2005) seeking to incentivise purchases of digital enablers by providing tax exemptions for retail sales as well as for smartphones. This law was later discontinued.

[3] According to the WTO Integrated Database (IDB), 37% of the total specific tariff lines containing Electronic components received duty-free treatment (i.e. zero tariffs) in 2021, with tariffs imposed on the remaining 63% of HS lines explaining the overall tariff level in this category.

[4] The TRAINS database is coordinated by UNCTAD: "Based on the MAST classification, UNCTAD has been collecting data on NTMs since 2012. Today, with the collaboration with partner agencies including ITC, WTO, and World Bank among others, UNCTAD features comprehensive and comparable trade Regulations and NTM data for 109 countries (covering more than 65000 measures)." See https://trainsonline.unctad.org/about

[5] According to the TRAINS NTM database, TBT measures covering ICT goods are related to, for instance, 'Portaria Nº004 de 4/I/11', 'Decreto Nº62465 de 26/03/1968. Reglamento de la Ley 5280/67.' And 'Decreto Nº96036 de 12/05/1988. Reglamento de la Ley Nº7646, de 18/12/1987, implementado por Decreto Nº1207 de 01/08/1994'. Brazilian authorities have informed that: Ordinance (Portaria) Nº004 of 4/I/11 seems to refer to Ordinance (Portaria) No.4 of 1/4/2011 issued by the National Institute of Metrology, Standardization and Industrial Quality (INMETRO), which regulates photovoltaic energy equipment and systems, and that Decree Nº96036 of 05/12/1988; Law Nº7646, of 12/18/1987; Decree Nº1207 of 08/01/1994 have been revoked. They have also informed that Decree Nº62465 of 03/26/1968 was revoked by Decree s/nº of 04.25.1991, DOU 04.26.1991. They have also informed that Law 5280/67 is in force, but that the above decree which regulates it was revoked.

[6] According to the TRAINS NTM database, these measures are related to 'Portaria Nº23 de 14/07/2011' and Portaria Nº10 de 25/1/2010. Modificada por Portaria Nº562 de 23/12/2014. Brazilian authorities have informed that Ordinance Nº10 of 01/25/2010 and Ordinance 562 of 12/23/2014 seem to refer to ordinances issued by the National Institute of Metrology, Standardization and Industrial Quality (INMETRO) which regulate the safety of electrical appliances for household and similar purposes, in line with IEC 60335.

[7]According to the TRAINS NTM database, export-related measures are related to 'Ley Nº10184 de 12/02/2001. Reglamentado por la Resolución Nº27 de 06/05/2008 y Nº126 de 26/12/2013.' and 'Portaria Nº23 de 14/07/2011 y sus modificaciones'.

[8] For further information on Brazil's NTMs or their product scope, refer to https://trainsonline.unctad.org/home. See a list of the different types of non-tariff measures in Annex Table 2.A.1.

[9] It should however be noted that legislative changes (e.g. repeal of measures) occurring between the last update of the dataset (2020) and the time of writing are not captured by this analysis.

[10] The SPS measure, classified as A83 in the international classification of Non-Tariff Measures, is related to 'Portaria Nº23 de 14/07/2011.'

[11] It should, however, be noted that Brazil does not have price control measures (F) or Measures affecting competition (H) on ICT goods, which are not included in Figure 2.6 because information on these NTM types is not available for all comparator countries.

[12] Figure 2.9 uses data from the SISCOSERV firm-level database, based on the NBS services classification. This means that ICT service sectors are identified in the NBS nomenclature and that they are not directly comparable to statistics from the Balance of Payments (i.e. Figure 2.8).

[13] Noting that input-output tables generally capture the use of ICT goods and services from external sources (outside of the firm/factory) rather than the extent to which ICT inputs are being used within the firm or factory.

[14] Calculations are based on OECD TiVA data for 2016.

[15] These figures are, in part, driven by the types of products produced across different countries and are therefore subject to some aggregation bias. Some sectors could be more digitisable than others within broad identified categories.

[16] It should, however, be noted that this is a high estimate as there are some sectors within the broad category of business services that may not be considered as digitally deliverable (see note to Figure 2.20).

# 3 The economic impact of joining the Information Technology Agreement

This chapter examines Brazil's trade in goods contained in the WTO Information Technology Agreement (ITA). It discusses the Agreement and models the potential implications of accession on Brazil's economy. The results suggest that lower prices for IT goods arising from accession to the ITA can lead to growing competitiveness across a range of sectors, including in primary activities but also services and manufacturing. Accession might also increase medium-term GDP by 0.17% in Brazil and 0.05% in Argentina. However, domestic IT value added is likely to decline and some tariff revenue will be lost.

## Key messages

- Brazil and other MERCOSUR countries are not party to the WTO's Information Technology Agreement (ITA) setting tariffs to zero on a wide range of IT goods. This means that the average tariff faced is around 11.6% on ITA goods.
- A computable general equilibrium analysis suggests that lower prices for IT goods would lead to growing competitiveness across a range of sectors, including in primary activities services and manufacturing.
- Accession could also increase medium-term GDP by 0.17% in Brazil and 0.05% in Argentina but domestic IT value added is likely to decline and some tariff revenue will be lost.

Brazil has a relatively low use of ICT goods (and services) in the production of exports, including in sectors of comparative advantage such as mining and agriculture (Chapter 2). This reflects, in part, that Brazil might not be a competitive producer of IT goods. Brazil relies on imports to access IT goods, but these are subject to relatively high tariffs and non-tariff measures (Chapter 2).

Against this backdrop, this chapter looks at the economic effects and transmission mechanisms associated with Brazil hypothetically joining the Information Technology Agreement (ITA), an agreement that sets tariffs to zero on a range of IT goods. It does so by building an analytical framework to estimate the value of ITA trade in Brazil, and simulating the impact of ITA accession using a Computable General Equilibrium model (OECD METRO model).

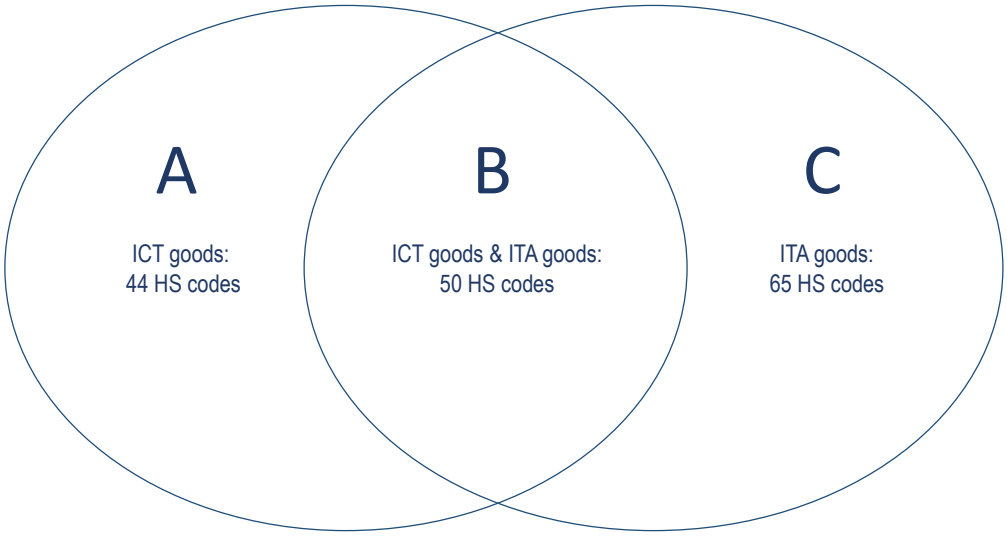
### 3.1. The Information Technology Agreement and Brazil's trade

Information Technology (IT) goods form an integral part of the physical infrastructure that enables the digital transformation and participation in digital trade. As a result, and with a view to "encouraging technological development and fostering the expansion of the world economy" (WTO, 1996[1]), some WTO members have taken steps to liberalise IT goods trade through the Information Technology Agreement (ITA) of 1996 and its expansion agreement of 2015 (also known as ITA II). The ITA sets tariffs to zero on a Most Favoured Nation (MFN) basis on a wide range of IT goods including computers, software, telecommunications equipment, scientific instruments, semiconductors and parts and accessories thereof (Box 3.1).

Despite an overlap, ITA goods differ from ICT goods at the product level (Figure 3.1). In this chapter, ITA goods are considered to be those that were liberalised through the 1996 WTO Information Technology Agreement.[1] By contrast, the definition of ICT goods used in previous chapters relates to goods that must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display (OECD (2011, p. 20[2]); see Annex 3.A for greater detail).

### Figure 3.1. ICT goods slightly differ from ITA goods, although there is significant overlap

Own calculations using the HS2017 nomenclature, long list of ITA goods



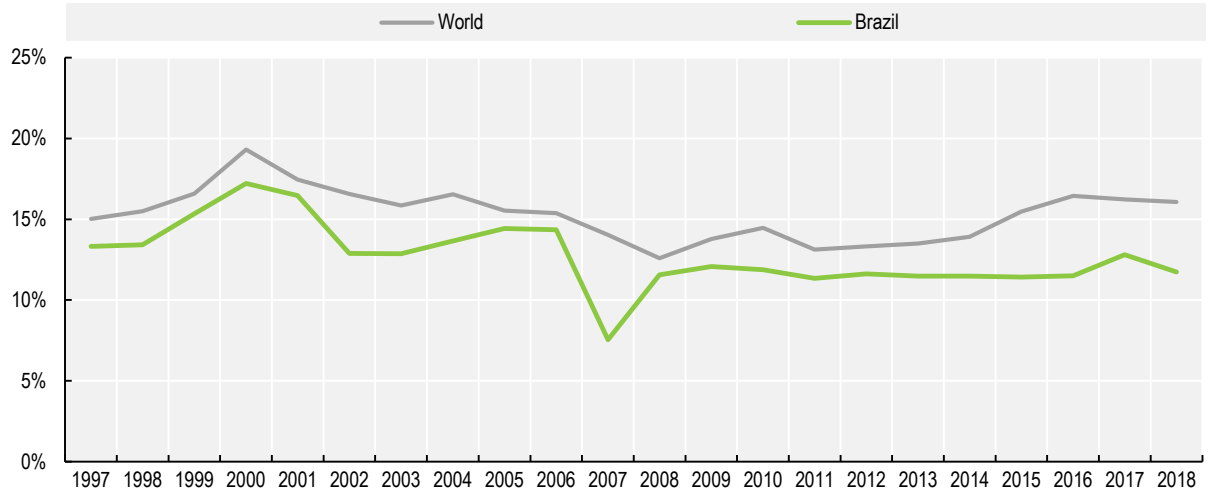

Note: The expressions 'ITA goods' and 'IT goods' are used interchangeably in this chapter. ITA goods refer to those under the 1996 ITA agreement not the ITA II. There are 44 HS codes that capture ICT goods that are not in the ITA list, 50 HS codes that are both ICT and ITA goods and 65 HS codes that are in the ITA list but not in the ICT goods list.

Practically, this means that ITA goods[2] and ICT goods cover similar items. Subset A (goods contained in the ICT list but not in the ITA list) include consumer electronic equipment such as microphones, headphones or monitors, as well as television and radiobroadcasting-related products.[3] Subset B (goods contained in both the ICT and the ITA lists) includes computer and peripheral equipment, communication equipment (e.g. mobile phones) and electronic components (e.g. semiconductor devices). Subset C (goods that are in the ITA list but not in the ICT product list) mostly includes scientific instruments, cables, electrical capacitors and resistors, and electrical machinery.

Globally, the share of ITA goods in total trade peaked around the year 2000, thereafter witnessing a decline reflecting falling prices of ITA goods (WTO, 2021[3]). The value of trade in ITA goods increased again starting from around 2015,[4] although the change in Brazil's import mix appears to be rather moderate compared to the global average (Figure 3.2). Brazil's imports of ITA goods also appear to be lower as a share of total imports than for the world on average.

### Figure 3.2. Brazil imports less ITA goods than the world on average

Value of trade in IT goods relative to total trade (ITA upper bound estimate)




Source: Own calculations using the COMTRADE database.

### Box 3.1. What is the ITA and what is its economic impact?

***The 1996 Information Technology Agreement***

The Information Technology Agreement, signed at the 1996 WTO Ministerial Conference in Singapore, is a plurilateral agreement that sets tariffs to zero on a most-favoured nation (MFN) basis on a wide range of IT goods. This means that countries that have not joined the ITA can also benefit from enhanced market access opportunities (WTO, 2021[4]). On its 20-year anniversary the agreement counted 82 WTO members, accounting for 97% of world trade in IT products.

The ITA identifies duty-free goods based on two Attachments. Attachment A provides a list of HS 6-digit codes, while Attachment B provides product descriptions that Members translate into specific HS codes in their own schedules. The particular structure of the ITA and the revisions of the Harmonised System of classification pose a number of methodological challenges to the analysis of trade in ITA goods (see Annex 3.A for a more detailed discussion of the approach adopted in this chapter).

The existing literature on the economic impact of the ITA generally finds that the Agreement significantly lowered prices of IT goods, increased trade in IT products, accompanied greater IT-related innovation in developing countries and created new export opportunities in downstream industries for developing country members.

- Feenstra (2008[5]) estimates a high pass-through effect of ITA tariff reductions on prices of goods covered by the agreement. Multilateral tariff reductions had a highly magnified effect on ITA goods that are mainly traded in fragmented production processes (Feenstra, 2008, p. 111[5]).
- The trade creation effects of becoming an ITA member have been reported to be large. All else equal, non-ITA WTO members were found to import 14% more from WTO members when they joined the ITA (Bora and Liu, 2008, p. 10[6]; Mann and Liu, 2007[7]).

- Anderson and Mohs (USITC) (2010[8]) also argue that the ITA has increased the participation of developing countries in GVCs, particularly on the export side – with China being a prominent example.
- Using patent statistics in computer technology, telecommunications and semiconductors, the WTO (2012[9]) finds that developing members that joined the ITA witnessed an increase in IT-related innovative activity compared to their average industry innovation, while this trend is absent for economies outside the ITA (including Brazil).
- In a comprehensive study, Gnutzmann-Mkrtchyan and Henn (2015[10]; 2018[11]) find that the ITA has contributed to more trade through tariff reduction, tariff elimination and non-tariff effects. Commitment effects arising from ITA membership boosted both ITA imports and exports, by facilitating access to intermediate inputs and attracting foreign investment. For countries that joined the ITA as part of broader policy objectives, accession to the ITA resulted in an 8.5% increase in final goods exports (WTO, 2015, p. 22[10]; WTO, 2017[12]).

Some studies are also critical of the ITA agreement, in particular in the case of India's accession. Using descriptive statistics, these argue that ITA accession can have adverse effects on the domestic electronics industry, employment, tariff revenue and so-called "policy space".

- Kallummal (2012[13]) criticises the view that ITA accession was critical to the success of India's software industry, and argues that the ITA led to greater import dependence on hardware. It also claims that non-tariff measures (especially Technical Barriers to Trade) were adopted on ITA goods after 1996 to make market access commitments less effective.
- Joseph (2013[14]) observes that global trade in ITA products grew at a faster pace before the signing of the ITA agreement than in the period following the agreement, and points to the increasing concentration of exports of ITA products among four countries following 1996.

***The 2015 Information Technology Agreement***

At the Nairobi Ministerial Conference in 2015, over 50 WTO members decided to expand the coverage of the ITA by eliminating tariffs on an additional 201 products accounting for about 7% of global trade. The "ITA 2" covers new generation semi-conductors, semi-conductor manufacturing equipment, optical lenses, GPS navigation equipment, and medical equipment such as magnetic resonance imaging products and ultra-sonic scanning apparatus (WTO, 2021[4]).

Estimates based on CGE modelling for the European Union suggest that joining the ITA expansion will lead to an increase of goods and services exports from the European Union in the range of 0.20-0.34%, and a total import increase of 0.12% to 0.23% for the region (European Commission, 2016[15]).[1]

1. Ezell and Wu (2017[16]) also estimated the combined effects of joining the Information Technology Agreement as well as its Expansion on the economy of ten developing countries, finding that it might lead to substantial gains in economic growth

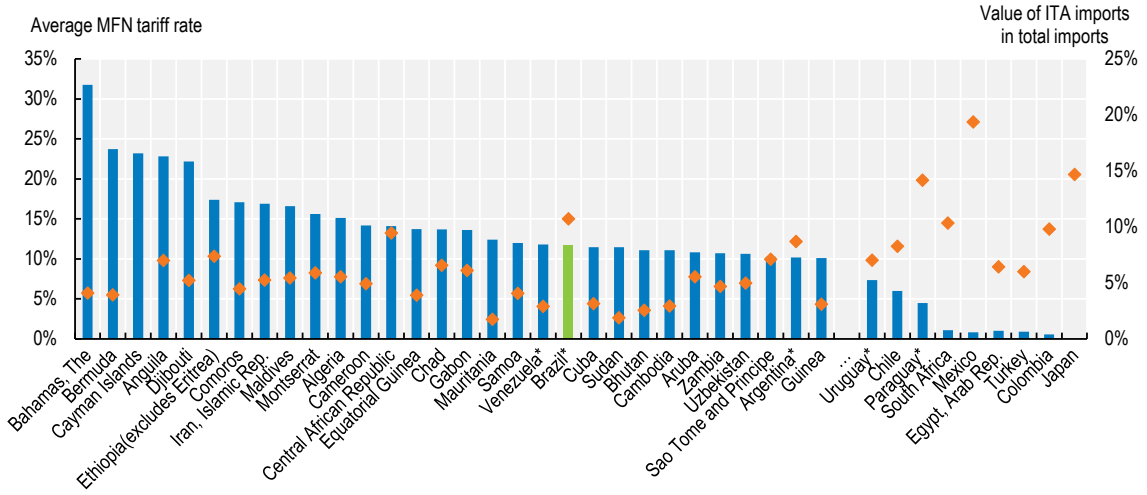
On average, MERCOSUR countries maintain relatively high tariffs on ITA goods – in 2018 Brazil had an (unweighted) average MFN tariff of 11.6% (20th highest in the world) and Argentina an average MFN tariff of 10.2% (29th in the world) (Figure 3.3). The issue of the MERCOSUR tariff level is also compounded by tariff perforation issues.[5] This, combined with the fact that Brazilian imports of ITA goods are considerable, representing about 11% of total imports, suggests that Brazil may have important trade gains from participating in the ITA.[6]

In addition, Brazil's binding overhang – the difference between its bound and applied duties – remains high (Figure 3.4, Panel a). This can create additional uncertainty when trading goods (WTO, 2015[17]), further affecting Brazil's ability to participate in digital trade. In comparison to other non-ITA members, Brazil also maintains high effectively applied duties on ITA goods. Other major non-ITA members have indeed lowered tariffs on ITA goods either unilaterally, as is the case for Mexico (Anderson and Mohs, 2010[8]) or

through preferential agreements, as is the case for Chile (Harrison, Rutherford and Tarr, 2002[18]; 2005[19]), or by eventually joining the ITA as part of broader policy objectives as, for example, Colombia (Figure 3.4, Panel b).

## Figure 3.3. Brazil maintains relatively high tariffs on ITA goods despite being a large importer

Simple average MFN tariff on ITA goods (left axis – represented with bars) and share of IT imports in total imports (right axis – represented with diamonds), 2018 or latest available year



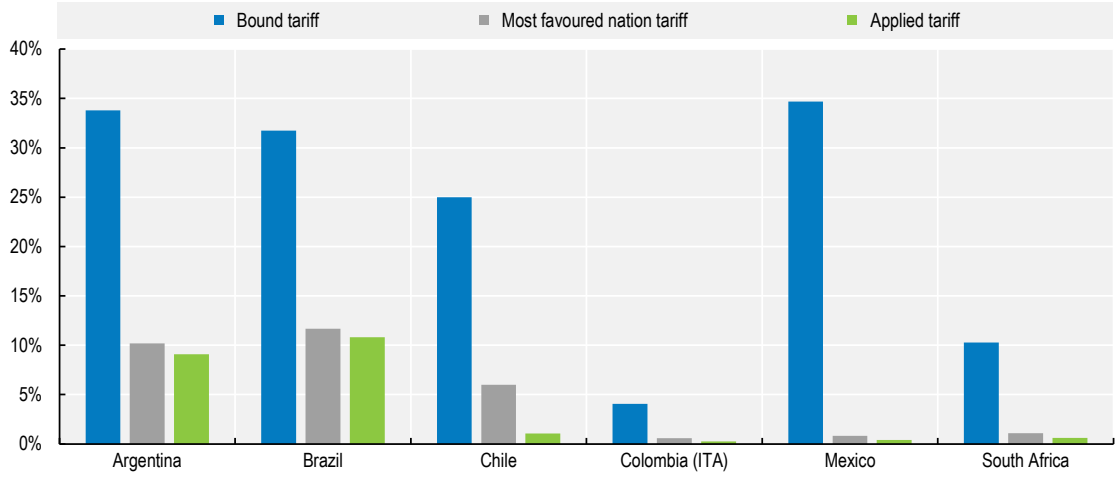

Note: * Indicates MERCOSUR membership. Upper bound estimate of ITA trade.
Source: TRAINS database.

Breaking down the tariff regime at the product level shows that Brazil's tariffs are lower for electronic integrated circuits (1.6% *ad valorem*) and semiconductor devices (1.7%), which together account for about 29% of the total value of ITA imports.[7] However, tariffs remain high on electrical transformers, converters, and inductors (17.4%), electrical capacitors and electrical resistors (14.3%), insulated cables and conductors (14.2%), and media storage devices (14.1%). These products account for about 8.4% of the value of ITA imports in Brazil. In addition, MFN tariffs are also high on telephone sets (13%), computer products (12.3%) and parts of radio apparatus (12%). These products account for 38% of the total value of ITA imports in Brazil (see Annex Table 3.A.1 for greater detail).

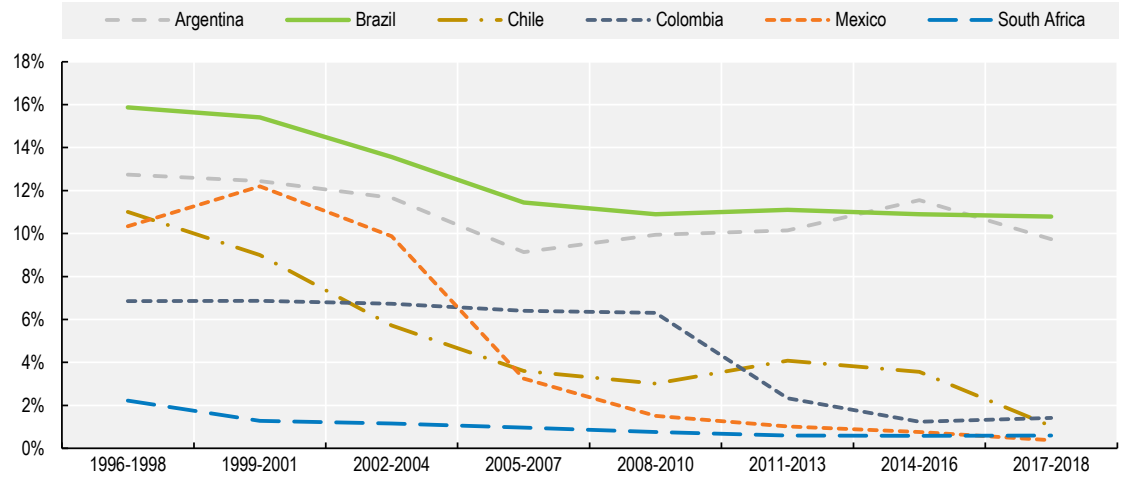
Tariff barriers on these products may be more costly in light of growing digitalisation of economic activities, including the growing role of ITA goods as inputs into the production of many different goods and services. Indeed, more that 90% of ITA goods imported by Brazil were intermediate and capital goods in 2018 (Figure 3.5) – compared to 76% for the World on average. While tariffs on ITA products remain higher for consumer goods than for intermediates, the average tariff on ITA intermediate goods is around 10% and that on capital goods is 12.5% for Brazil (Figure 3.6), significantly higher than for the world average (at 5.7% and 5.3% respectively). These duties increase the cost of importing technology-intensive inputs, affecting the ability of Brazil to leverage digital technologies for trade.

## Figure 3.4. Brazil's applied tariff rates remain high relative to other non-ITA members, and binding overhang can prevent participation in IT trade

a. Bound, MFN and applied duties on ITA goods, selected comparator countries, 2018



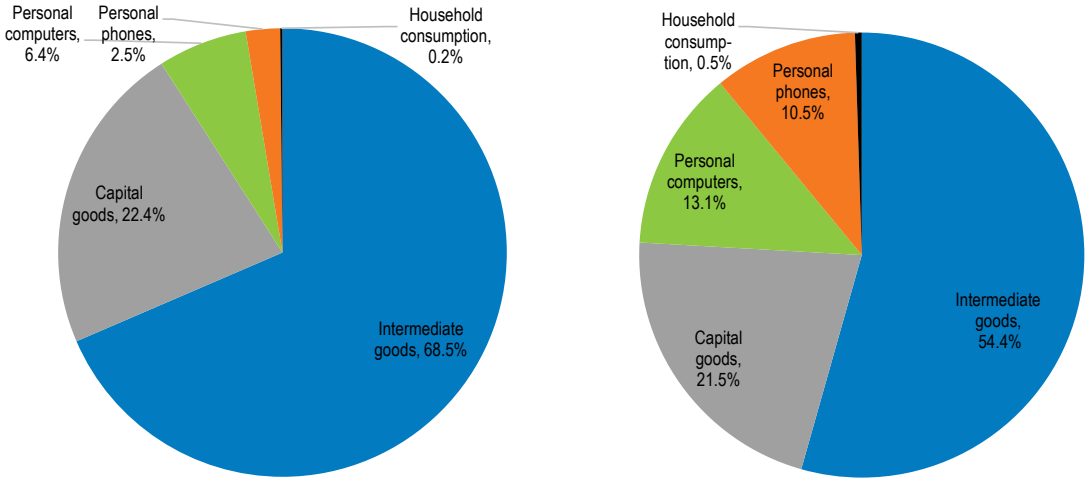

b. Applied duties on ITA goods, selected comparator countries, moving average




Note: Upper bound estimate of ITA goods. Colombia joined the Information Technology Agreement in 2012. Colombia's bound, MFN and applied tariffs on ITA goods can be different from flat zero due to the 'ex-outs' included in the ITA long list, as well as a result of specific national classification decisions.
Source: TRAINS database.

## Figure 3.5. Brazil's imports of IT goods mainly consist of intermediates and capital goods

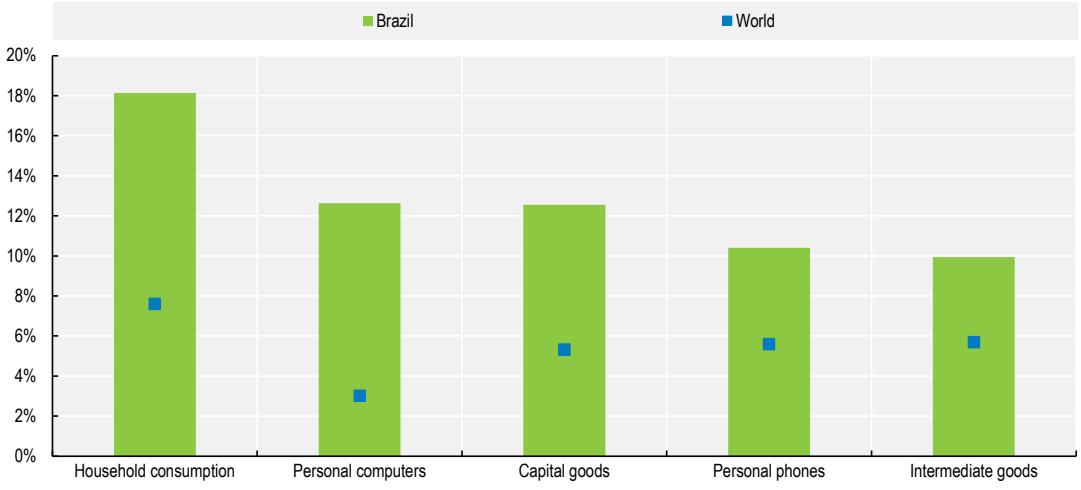
Brazil (left) and the World average (right), 2018




Note: Values expressed as a share of total IT imports.
Source: TRAINS database and OECD BTDIxE end-use correspondence.

## Figure 3.6. Although Brazil's tariffs are lower on IT intermediate and capital goods, they remain high relative to the world average

Simple average MFN duties on ITA imports by end-use category




Source: TRAINS database and OECD BTDIxE end-use correspondence.

## 3.2. Estimating the impact of ITA accession

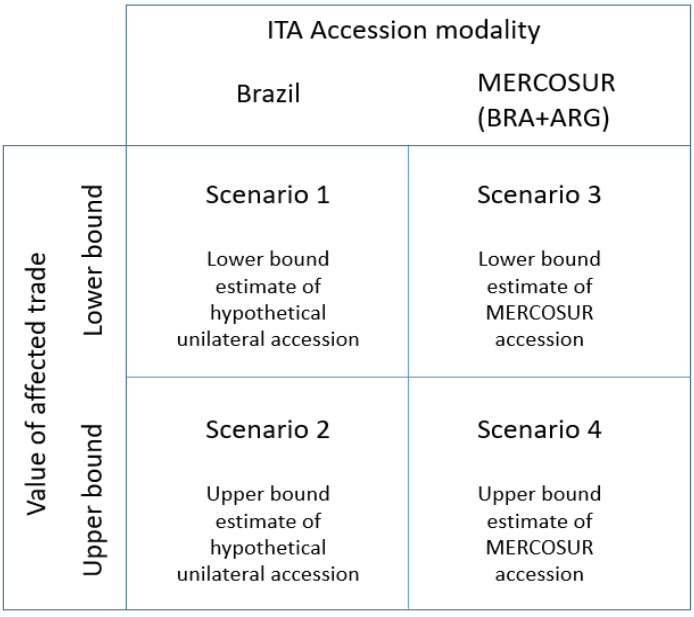
Brazil's hypothetical accession to the 1996 ITA can be assessed in the framework of Computable General Equilibrium (CGE) models, which are especially well suited for ex-ante analysis of potential policy changes. CGE models have their advantages and limitations. On the one hand, CGE models, such as the OECD METRO model (OECD, 2021[20]), provide a comprehensive picture of the input-output linkages within Brazil's economy and with its trade partners, which allows gauging the consequences of accession on

different sectors of economic activity. CGE modelling also helps identify the channels of transmissions of policy changes, mapping their impact on macroeconomic variables like government expenditure and GDP. On the other hand, CGE models are less suited to capturing product specificities, since analysis tends to be at the sectoral level. They also work under a set of relatively strict assumptions about the structure of the economy and their economic interactions.

This means that the results presented herein need to be viewed in the context of the limitations of the model.[8] While the model can provide a useful framework for thinking about some of the consequences of joining the ITA agreement, including mapping some of the transmission channels, it only provides a partial view.

Owing to the way the ITA is set up, the value of Brazil's imports that can be considered as falling within the Agreement can be qualified using a lower and an upper bound estimate.[9] [10] Brazil is also a member of MERCOSUR, which limits its ability to unilaterally reduce its tariffs on ITA products without introducing some flexibilities in the common external tariff. This leads to four possible modelling scenarios (Figure 3.7).[11] The main scenarios of reference for this exercise are scenarios 3 and 4 – providing an estimate of a hypothetical tariff drop in Brazil and Argentina in those sectors affected by the ITA.

### Figure 3.7. Modelling scenarios for ITA accession




Note: The upper bound estimate includes all goods contained in the ITA at the HS 6 digits level (including those with product 'ex-outs'). The lower bound estimate only includes goods without product 'ex-outs' (i.e. entirely covered at the HS 6 digit level). Note that the upper bound estimate may underestimate the maximum possible value of ITA trade as an attempt at classifying Appendix B products is not undertaken (see Annex 3.A for greater detail).

The tariff drop resulting from ITA Membership is calculated at the HS 6-digit product level and then aggregated to the METRO sectors. In practice, for Scenario 4, if Brazil were to join the ITA its trade-weighted average tariff on electronic equipment would fall by 49% relative to the baseline value (from 12% to 6%); its tariff on machinery and equipment would fall by 6% (from 12% to 11%) and tariffs on Mineral products would fall by 1% relative to the baseline values.[12] By virtue of the common external tariff, Argentina would witness a similar reduction in tariffs (49% in electronic equipment, 5% in machinery and equipment and 2% in mineral products relative to the baseline value). Tariff rate decreases would be lower with a conservative interpretation of what constitutes trade in ITA goods.[13]

### Box 3.2. Main features of the OECD METRO model

METRO, like many CGE models, relies on a comprehensive specification of all economic activity within and sometimes between countries (and therefore the different inter-linkages that tie these together). The model builds on the GLOBE model developed by McDonald and Thierfelder (2013[21]). The novelty and strength of METRO lies in the detailed trade structure and the differentiation of commodities by end use. Specifically, commodities and thus trade flows are distinguished by whether they are destined for intermediate use, for use by households, for government consumption, or as investment commodities.

The underlying framework of METRO consists of a series of individually specified economies interlinked through trade relationships. As is common in CGE models, the price system is linearly homogeneous, with a focus on relative, not absolute, price changes. Each region has its own numeraire, typically the consumer price index, and a nominal exchange rate (an exchange rate index of reference regions serves as model numeraire). Prices between regions change relative to the reference region.

The database of the model relies on the GTAP v10 database (Aguiar et al., 2019[22]) in combination with the OECD Inter-Country Input-Output Tables, which are the main source of the OECD Trade in Value Added Indicators and allows the model to distinguish trade for use in intermediate production or final demand. Policy information combines tariff and tax information from GTAP with OECD estimates of non-tariff measures on goods (Cadot, Gourdon and van Tongeren, 2018[23]), services (Benz and Gonzales, 2019[24]; Benz and Jaax, 2020[25]), trade facilitation (OECD, 2017[26]) and export restricting measures. The METRO database contains 65 countries and regional aggregates and 65 commodities.

The model is firmly rooted in microeconomic theory, with firms maximising profits and creating output from primary inputs (i.e. land, natural resources, labour and capital), which are combined using constant elasticity of substitution (CES) technology, and intermediate inputs in fixed shares (Leontief technology). Households are assumed to maximise utility subject to a Stone-Geary utility function, which allows for the inclusion of a subsistence level of consumption. All commodity and activity taxes are expressed as *ad valorem* tax rates, and taxes are the only income source to the government.

#### *METRO model set-up for estimating the impact of ITA accession on Brazil*

The particular version of METRO used in this exercise distinguishes G20 economies (the EU aggregate includes 24 members, while France, Germany, Italy and the United Kingdom are separately identified), regional aggregations (Latin America and South East Asia) and the rest of the world category. The model is calibrated to 23 regions, 23 sectors and 8 production factors for this analysis, and the simulations represent medium-term scenarios where production factors are mobile across sectors, but the overall endowment of labour and capital remain fixed.

In terms of model "closures", the main scenario of reference is set-up with a fixed trade balance and a flexible nominal exchange rate. Wages are assumed downwardly rigid, but remuneration rates of all other factors (land, capital, natural resources) are assumed to adjust. Investment shares are assumed to be fixed while savings rates adjust. Government expenditure remains fixed whereas the internal balance is left to adjust.

However, the sensitivity of results to different model closures is also tested. In light of the impact of government account closures in this exercise, simulations are undertaken with two different closures: one that fixes government expenditure and allows the internal balance to adjust through increases in the household savings rate, and another where government expenditure is flexible so that tariff revenue losses can lead to falls in expenditure. Similarly, the exercise is also run with a variable trade balance and a fixed exchange rate, as well as by testing the sensitivity or results to labour productivity shocks and changes in the labour market assumptions. The chapter distinguishes results on the basis of these assumptions, specifying these model closures in the notes to figures.

### *3.2.1. ITA accession is likely to result in value added gains in a range of sectors but also in concentrated losses in the electronic equipment sector*

The impact of ITA accession would differ across industries (Figure 3.8). Sectors such as *other manufacturing*, *transport equipment* and *business services* would witness an important expansion in value added, with a strong positive impact for activities in agricultural and primary sectors (*natural resources, oil seeds, other agriculture*). This expansion of activity relative to the baseline scenario (i.e. a scenario where Brazil and Argentina do not accede to the ITA) is likely to arise as a result of the greater use of imported inputs that become cheaper with tariff liberalisation.

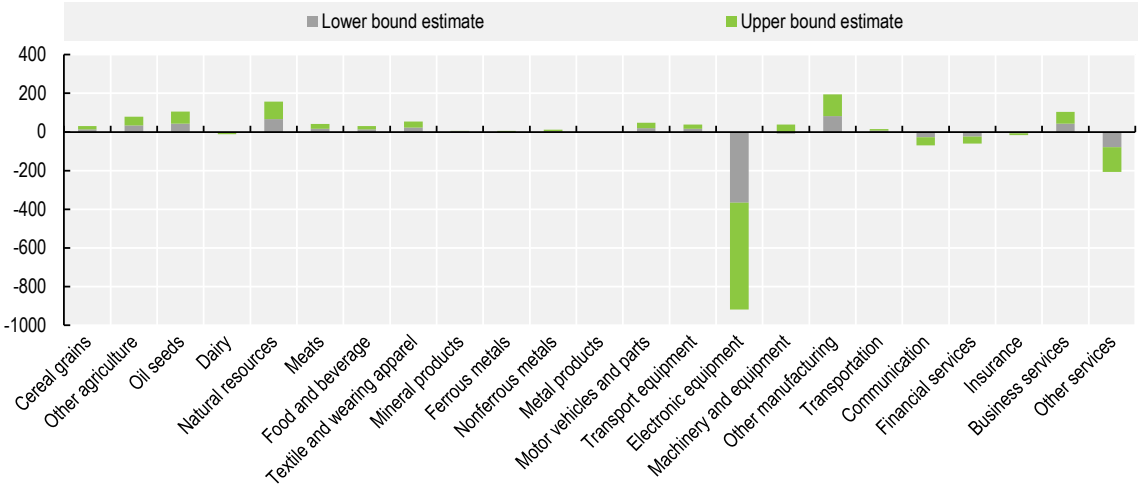
However, ITA accession would also result in concentrated value added losses in the *electronic equipment* industry – registering a contraction of 3% relative to the baseline value – owing to import competition. Losses would also be recorded in the *other services* sector arising from adjustment mechanisms in response to customs revenue losses.[14] This sector makes up around 43% of total household expenditure, and is therefore particularly exposed to reductions in spending.[15]

The impact on value added in the *other services* sector is sensitive to assumptions on the government account closure, i.e. to how the government would respond to the decrease in customs revenues. Indeed, when government expenditure is allowed to be flexible, the reduction in tariff revenue as a result of ITA accession results in even greater negative value added changes in *other services*. This is because, while the sector accounts for an important share of household expenditure, it also makes up for an even larger share of government expenditure (around 63% of total expenditure) and is therefore particularly exposed to reductions in public spending.[16]

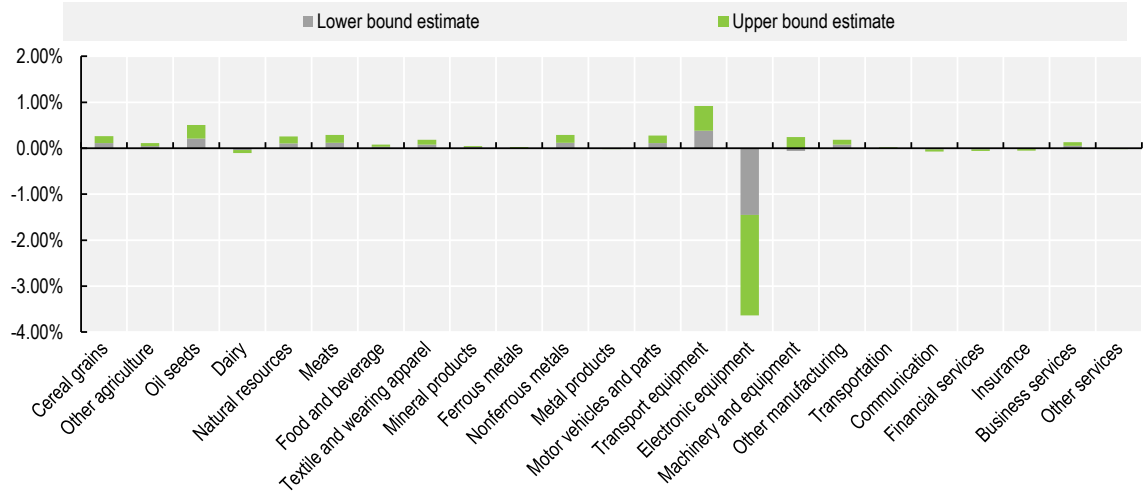
Regardless of the model closures, however, the emerging picture is one where electronic equipment is likely to see its production volume shrink to the benefit of other economic activities using electronic equipment as inputs, while the impact on the *other services* will be driven by how the government responds to ITA accession. Overall, in the main scenario, the net change in domestic value added is slightly negative (USD -340 million), due to the large reductions in *electronic equipment* (USD -917 million) and in *other services* (USD -207 million), coupled with reductions in demand as a result of higher household savings, especially in *insurance* and *transportation services*, *food*, and *textiles*. However, where productivity gains driven by tariff reductions might arise, this negative change can be attenuated (Box 3.3).

## Figure 3.8. ITA accession would result in value added gains in most sectors of the economy, amidst more concentrated losses in electronic equipment and other services

a. Absolute changes relative to the baseline scenario, USD million




b. Percentage changes relative to the baseline scenario




Note: Government expenditure is fixed. The trade balance is fixed. The baseline scenario refer to a hypothetical scenario in the medium-term where Brazil and Argentina do not accede to the Information Technology Agreement.
Source: Own simulations using OECD METRO model.

### *3.2.2. ITA accession is likely to lead to a decrease in import prices and an increase in import quantities of electronic equipment*

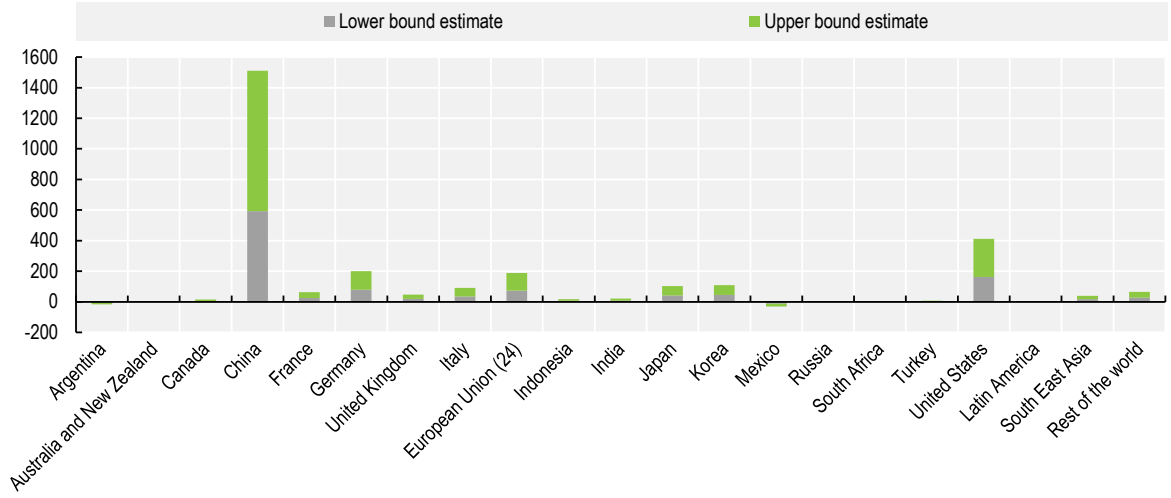
As a result of ITA accession, overall import demand is projected to increase by 0.20%-0.48% with imports of *electronic equipment* growing between 3% and 7.6% relative to their baseline value. Bilateral import prices for intermediates in *electronic equipment* from all trade partners decline in the range of-1.37% to -4.86% depending on the exporter, with similar decreases for capital goods, goods for government consumption and goods for private consumption.

In the *electronic equipment* sector, imports increase most from G20 partners except Argentina and Mexico, in light of the preferential arrangements currently in place with those countries (trade reorientation effect)

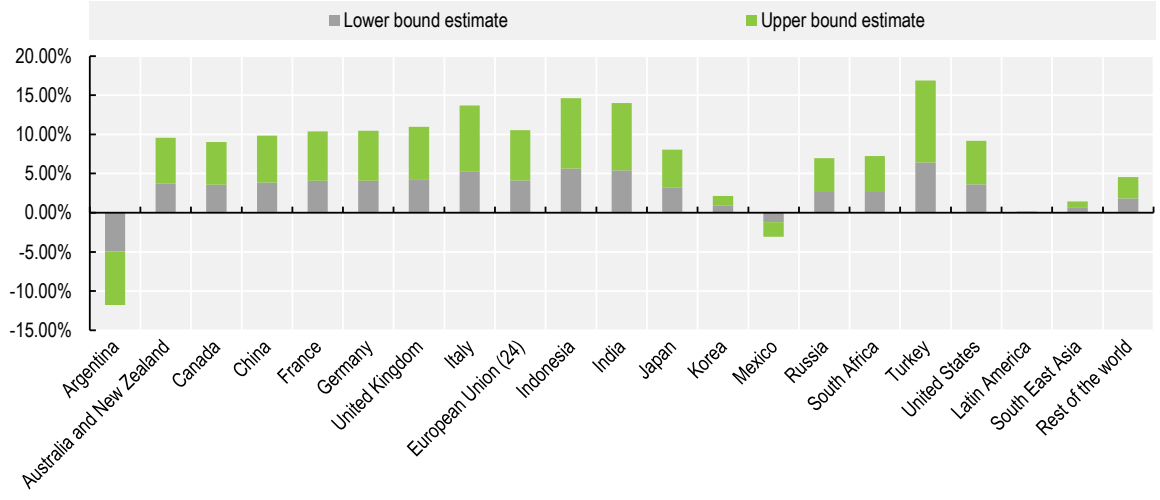
(Figure 3.9). In absolute terms, imports from China would grow most followed by imports from the United States.

**Figure 3.9. ITA accession would result in important increases in imports of electronic equipment from most trade partners, accompanied by trade reorientation effects for Argentina and Mexico**

a. Absolute change relative to the baseline scenario, USD million




b. Percentage change relative to baseline scenario




Note: Government expenditure is fixed. The trade balance is fixed.
Source: Own simulations using OECD METRO model.

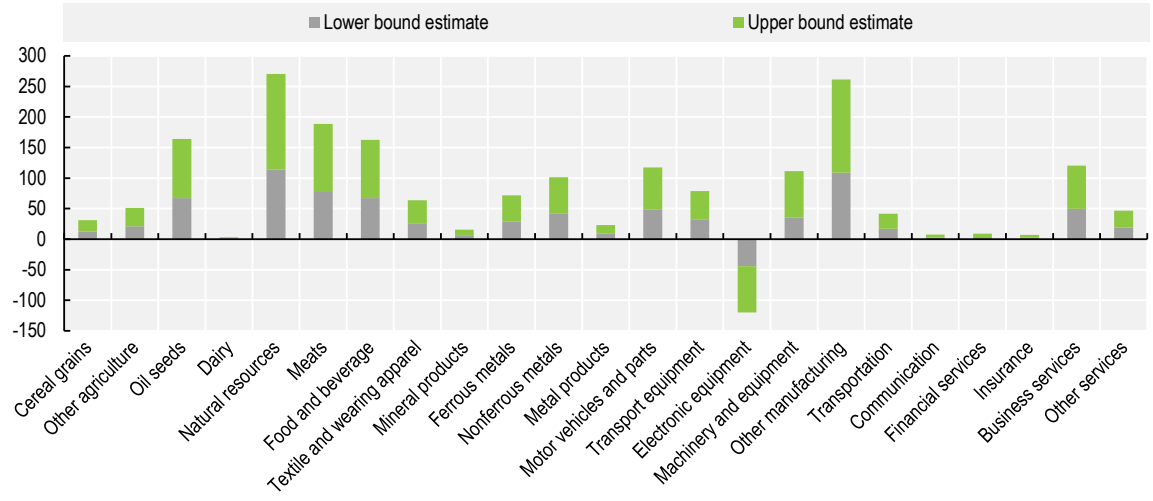
### *3.2.3. ITA accession is likely to lead to gains in export competitiveness, including in manufacturing and services sectors*

Brazil's accession to the ITA is projected to lead to export gains across all sectors except *electronic equipment* (Figure 3.10). In absolute terms, *other manufacturing*, *natural resources* and *meats* exports would see the largest gains, whereas *transport equipment*, *machinery and equipment* and *nonferrous metals* would see the highest increase relative to their baseline value.[17]

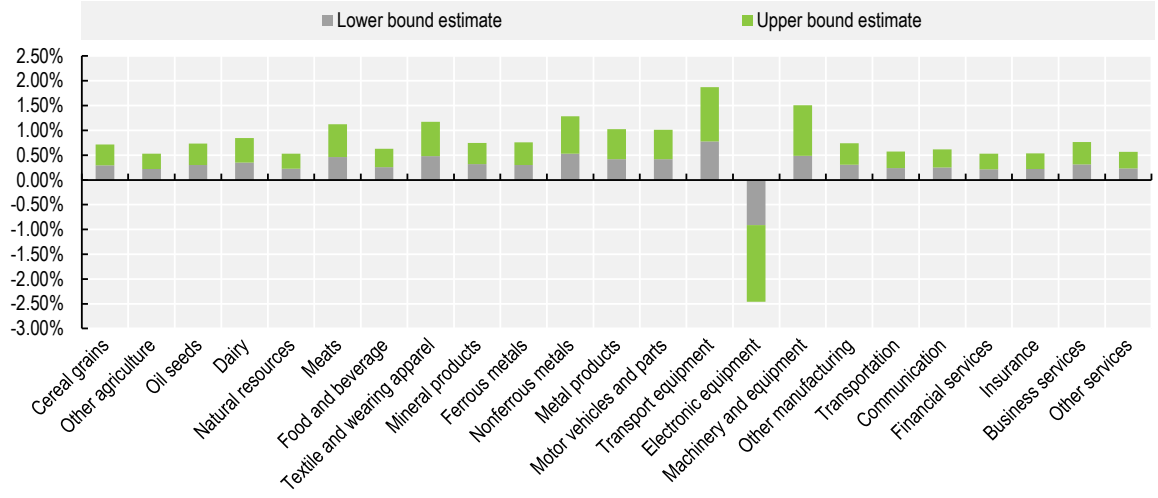
While the value of exports would increase in traditional sectors of comparative advantage such as *natural resources*, export gains are also observed in *business services* and *other services*, highlighting the complementarities between access to technological hardware inputs and export competitiveness in services sectors. Overall, ITA accession can have a positive impact on export diversification.[18]

## Figure 3.10. ITA accession would result in horizontal gains in export competitiveness, including for manufacturing and services sectors

a. Absolute change relative to the baseline scenario, USD million




b. Percentage change relative to baseline scenario




Note: Government expenditure is fixed. The trade balance is fixed.

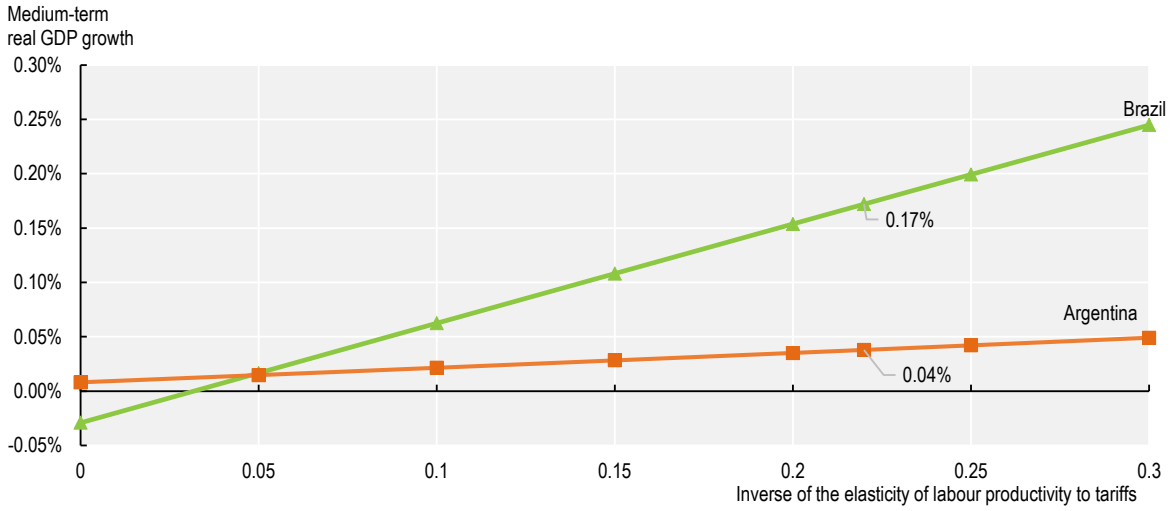
### *3.2.4. Macroeconomic effects of ITA accession*

The overall effects of ITA accession are sensitive to different model closures. For instance, the medium term impact on GDP can range between -0.03% when government expenditure is fixed to +0.01% when government expenditure is allowed to adjust, pointing to an overall impact on GDP that can be considered as neutral. However, these results are based on estimates that do not include possible productivity gains from ITA accession, or other secondary effects such as on investment.

To capture the productivity effects of ITA accession, a targeted shock, based on the 2020 *OECD Brazil Economic Survey*, is implemented (Figure 3.11 and Box 3.3). The results show that medium-term real GDP may increase by +0.17% in Brazil and +0.04% in Argentina as a result of joining the ITA in the presence of positive productivity dynamics. These figures are, however, based on a particular estimate of the elasticity of labour productivity with respect to tariffs (OECD, 2020[27]). Indeed overall GDP impacts are relatively sensitive to the elasticity of labour productivity with respect to tariffs, that is, the extent to which tariff liberalisation affects productivity. Nevertheless, the modelling shows that GDP gains also arise in the context of lower productivity shocks (Figure 3.11).[19]

## Figure 3.11. ITA accession has the potential to increase Brazilian GDP

Estimate of real GDP change following ITA accession as a function of the labour productivity gains expected from tariff reductions




Note: Upper bound estimate of ITA imports (Scenario 4); fixed government expenditure and external balance. Results from 8 different simulations using different values of the productivity-tariff elasticity.
Source: OECD METRO model.

The analysis also points to potential differences in the economic impact of accession between Brazil and Argentina. Owing to a smaller electronic equipment sector, Argentina's accession to the ITA is unlikely to have a negative impact on real GDP, even in the absence of positive productivity dynamics. However, it is also unlikely to lead to very high GDP effects, even when higher productivity effects are modelled. By contrast, Brazil displays a steeper curve in Figure 3.11, highlighting a higher potential for benefits from ITA accession in the presence of higher labour productivity dynamics, but, at the same time, greater potential to witness a GDP contraction if these productivity gains do not materialise due to pressures from import competition.

Beyond affecting macroeconomic results such as real GDP, the productivity shock also affects sectoral value added, imports and exports leading to somewhat different results to those reported in the body of the report. In general, strong productivity effects in the electronic equipment and machinery and equipment sectors increase factor demand for those activities. With mobile factors across sectors but fixed overall endowments, this can negatively affect output in other sectors of the economy, especially in agriculture, services and primary activities (see Annex 3.A for a discussion of the impacts).

In terms of other macroeconomic variables of interest, ITA accession is likely to lead to decreases in prices and slight increases in household income. However, the degree to which households will be able to

translate higher income into expenditure and welfare gains is also sensitive to closures in the government account. When government expenditure is flexible, households increase expenditure (+0.05%) and decrease their savings rate (-0.52%). However, when government expenditure is fixed, households adjust savings (+1.81%) and decrease their expenditure (-0.09%) to compensate for changes in the government balance. This means that the impact on household welfare can vary from a net aggregate gain of USD 807 million (flexible government expenditure) to a net loss of USD 1.39 billion (fixed government expenditure).[20]

In terms of government revenue, ITA accession is expected to lead to a 4% to 10% reduction in revenues from tariffs (equal to about USD 780 million to USD 1.9 billion) depending on whether the lower or the upper bound estimate is used.[21] This estimate is not sensitive to different model closures or productivity dynamics. While sizeable, this shock should be put in the perspective of the revenue generated form tariffs as a share of total government revenues. In the baseline scenario, import tariff revenue accounts for 2.6% of Brazil's government revenue (USD 19 billion),[22] with a much larger role played by factor use taxes (29.7% of total revenue – USD 220 billion), sales taxes (23.47% – USD 174 billion), income taxes (20.3% – USD 150 billion USD) and value added taxes (19.6% – USD 146 billion).

Nevertheless, the government account can be a key transmission mechanism for the impact of ITA accession on Brazil's economy. In this regard, a scenario in which Brazil maintains its current government expenditure would lead to the costs of accession being spread across economic activities and households, whereas a decrease in government expenditure is likely to result in significant reductions in the value added of the *other services* sector, in which government expenditure plays an important role.

While more comprehensive and complex modelling approaches may be required to determine the optimal tax policy response to ITA accession for Brazil, tax policy considerations should play a role if the prospects of ITA accession are discussed. This includes in terms of how government expenditure would respond as well as whether alternative revenue sources should be considered to compensate for the losses from tariff revenues.

### Box 3.3. Modelling the productivity effects of ITA accession

Beyond sectoral redistribution effects, ITA accession may result in positive productivity effects arising, for instance, from increased competition or access to cheaper imports. In order to simulate these effects, estimates of the elasticity of labour productivity with respect to tariff reductions from the 2020 *OECD Economic Survey of Brazil* are used. These are based on a panel data estimation across 33 sectors for the period 1995-2011 which suggest that a 10% decrease in tariffs resulted in an average increase of 2.2% in labour productivity in Brazil (OECD, 2020, p. 113[27]).

This productivity effect is multiplied by the share of labour in total factor demand to identify the overall effect on productivity. This translates into different productivity impacts across different sectors depending on the extent of tariff liberalisation (as a function of the narrow or broad definition of ITA products) and the share of labour in total factor demand.[1] In practice, this results in a 2.2% (short list estimate) to 5.5% (long list estimate) increase in labour productivity in the electronic equipment sector in Brazil, a 0.5% to 0.7% increase in labour productivity in the machinery and equipment sector, and a 0.1% increase in labour productivity in mineral products (for an elasticity parameter equal to 0.22).

The same elasticity of labour productivity with respect to tariffs (-0.22) is assumed for Argentina to balance possible productivity spillovers within the customs union. The impact on Argentina should therefore be interpreted with caution since this is a methodological choice to avoid large displacements within MERCOSUR as a result of productivity gains in Brazil but not in Argentina. In practice, this translates into a 2.8% to 7.7% increase in labour productivity for electronic equipment in Argentina,

0.5% to 0.9% for machinery and equipment, and a 0.2% labour productivity increase in mineral products for an elasticity parameter equal to 0.22 and with a broad interpretation of ITA goods.[2]

1. As sectors having a greater demand for labour benefit more from increases in labour productivity.
2. The slightly higher productivity increases in Argentina can be attributed to a more important role of labour in factor demand, especially in the electronic equipment sector.

### *3.2.5. Limitations of this exercise*

Computable General Equilibrium models provide a useful framework for ex-ante analysis of policy changes. They are especially useful in highlighting the channels of transmission arising from different policy choices and for alerting policy-makers to areas they might have not anticipated. However, as has been shown, the results are relatively sensitive to the assumptions made in the closure of the model, this is why it is important to point to some of the limitations of this modelling approach.

- While productivity-enhancing effects are likely to result from increased access to ITA goods, they are difficult to model. This chapter has shown the sensitivity of macroeconomic results to different sizes of the productivity effect. More need to be done to better capture productivity enhancing effects of access to IT goods across other sectors.
- The current model set-up does not take into account possible benefits arising from commitment on tariff rates (e.g. 'commitment effects' in WTO (2015[10]). Increased certainty arising from binding tariff commitments are likely to result in positive impacts on investment and could also promote GVC integration.
- The model set-up does not capture the benefits of reducing tariffs to zero on a number of products, as the tariff rate shock is applied as a weighted average in broader sectors in METRO. Zero tariffs on some electronic equipment would lead to gains in trade facilitation including streamlined customs procedures and reduced delays (WTO, 2015[10]). These effects cannot not be captured by reducing average tariff rates in broader industries.
- Beyond limitation related to the general approach, particular model closures also have an important impact on results. These include, for instance, assumptions on what the government would do to respond to the drop in tariff revenues resulting from accession, including for instance whether it would raise additional revenue through other tax instruments or rather reduce government expenditure. Results are therefore reported noting the sensitivity to different model closures in the government account and in the current account.

## 3.3. What are the takeaway lessons from this exercise?

- ITA accession is likely to result in benefits across many industries. This is because lower prices for electronic equipment and related items lower input costs across a range of sectors. However, import competition leads to concentrated value added losses in domestic IT good producing sectors.
- Lower import prices contribute towards greater ICT input use. Consequently, imports of electronic equipment increase between 3% to 7.6% following accession.
- Accession can also lead to greater exports, especially in primary activities but also in services and manufacturing activities. In this respect ITA accession has the potential to contribute to export diversification.
- When productivity effects are incorporated, ITA accession could increase Brazil's real GDP in the medium-term by 0.17% and Argentina's by 0.04%.

- However, ITA accession could lead to a 4% to 10% decrease of tariff revenue, and while this accounts for a small share of overall government revenue, fiscal policy considerations should accompany discussions on the region's accession to the agreement.

# Annex 3.A. The economic impact of joining the Information Technology Agreement

## The original ITA Product list

The Ministerial declaration on trade in information technology products of December 1996 (WT/MIN(96)/16) is used to identify the original list of ITA goods.[23] The declaration contains two attachments: Attachment A – which is itself subdivided in Section 1 and Section 2 – is a list of products identified by specific HS 6-digits codes in the 1996 nomenclature. Attachment B contains product descriptions for items included in the agreement but not identified by specific HS codes.

## Partial coverage of HS subheadings

Ninety-five of the 190 items contained in the ITA are accompanied by a notation (ex) which indicates that the items set to attract zero tariffs are found at a more specific level than the HS 6-digits level (i.e. an 8 or 10 digits sub-heading in national schedules) (WTO, 2012[9]). Since the HS classification system is harmonised internationally only up to the 6-digit nomenclature and comparative trade statistics can only be obtained at this level of aggregation, the value of trade in ITA goods can be identified by using one of three different approaches (WTO, 2012[9]).

A first approach would involve taking into account only the value of trade for the HS 6-digits codes under which all goods are set to attract zero tariffs, ignoring those products liberalised with ex-outs. This would result in an underestimation of the value of trade in ITA goods.

A second, "mixed" approach involves taking into account all the HS lines that are fully liberalised and some of the codes reported with ex-outs but that contain a high proportion of ITA products (WTO, 2012[9]; WTO, 2017[12]). This approach leads to a smaller underestimation of the value of trade in ITA products.

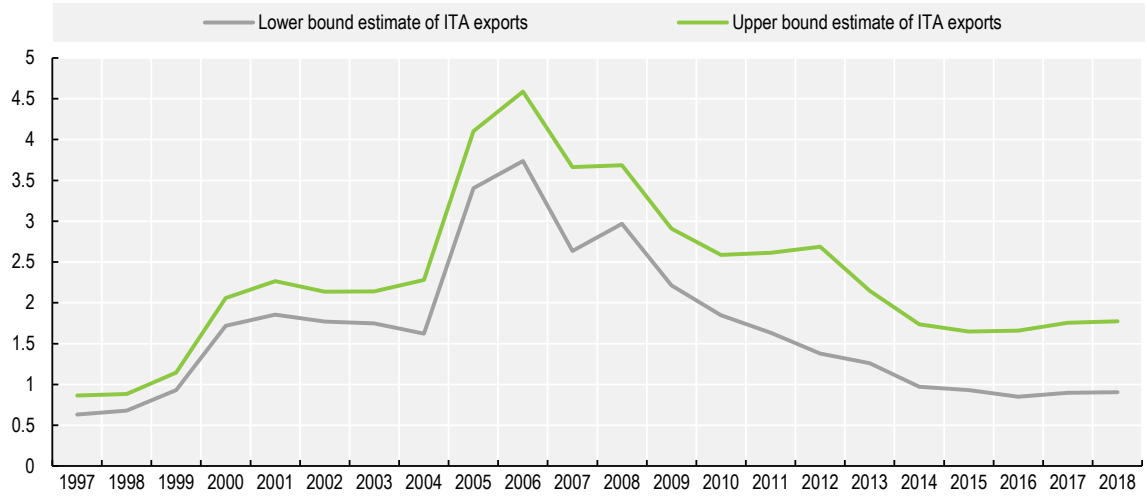
The third approach, which is the one adopted in this report for the descriptive section, consists in taking into account the full value of trade under HS codes that are affected by the ITA, regardless of partial coverage in some of the sub-headings (Bora, 2004[28]). In the absence of detailed information, this approach allows to avoid making judgements about which HS 6-digits lines contain a high proportion of ITA products in HS1996, as well has having to make such judgement for the different nomenclatures of the HS.

While this approach may lead to an overestimation of the value of trade in ITA goods (WTO, 2012[9]) it is adopted *mutatis mutandis* for all countries in the main body of the report.[24] It is also not adopted in the economic modelling section, where findings are reported depending on whether a "short" or "long" list of ITA products is used, producing a lower bound estimate and an upper bound estimate.

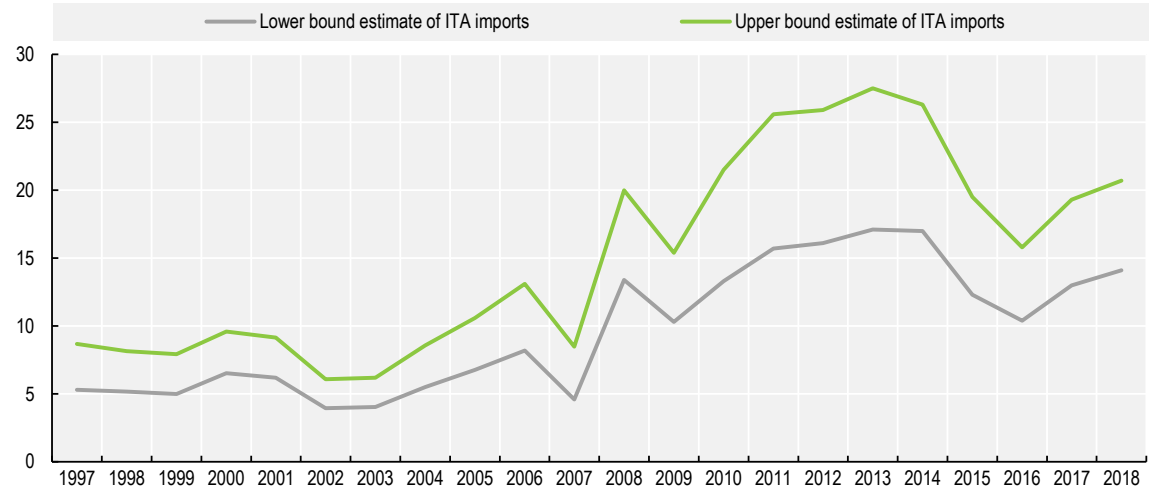
For the trade data, Annex Figure 3.A.1 below reports the value of imports and exports of ITA products using the first approach (considering only fully covered lines) and the third approach (considering all concerned lines at the 6-digit level) respectively. Since comparable tariff data is also only available at the HS 6 digits level, similar considerations apply for the analysis of tariff data.

## Annex Figure 3.A.1. Differences between lower bound and upper bound estimates of trade in ITA goods

a. Exports, USD billions




b. Imports, USD billions




Note: Slight discrepancies between the value of trade in ITA products reported above and in Chapter 3 are due to differences between the model list-based approach used to extract data from TRAINS and the automatic correlation tables used for the figure above from COMTRADE.
Source: COMTRADE.

## Revisions of the HS system and updating the ITA product list

The list of products covered by the ITA was affected by each revision to the HS system, which undergoes periodic updating in light of developments in technology.[25] Amendments affected the ITA product list to different extents, with the revision to the 2007 Harmonised System of classification bringing the most changes (WTO, 2017[12]; Anderson and Mohs, 2010[8]). While difficult, tracking the classification of ITA goods in more recent versions of the HS system is necessary to ensure that tariff data reflect the regime faced by the goods liberalised with the 1996 Declaration, regardless of where they are re-classified in successive HS nomenclatures.

In order to transpose the original model list in successive nomenclatures, the correspondence between HS1996 and HS2002 is obtained using the WTO document G/IT/W/22: 'List of changes due to the introduction of HS2002 Nomenclature in relations to the ITA products'. Lists of ITA products in HS2007, HS2012 and HS2017 revisions are obtained using UN correlation tables and World Customs Organisation (WCO) correlation tables. Hence, the number of unique HS 6 digits codes covered in the analysis changes according to different HS revisions, producing five different model lists for the different time intervals: 154 codes (HS 1996), 155 codes (HS 2002), 112 codes (HS 2007), 113 codes (HS 2012) and 115 codes (HS 2017) for the upper bound estimate.

In this respect, and in order to further refine the classification of ITA goods, an exercise was undertaken to verify the list of ITA goods in the HS2012 and HS2017 nomenclatures against tariff information for ITA Members in the TRAINS database. This ensures that the ITA model lists are consistent with observable bound and applied tariff rates and contributes to distinguishing 'ex-out' products from those entirely covered by the agreement in the more recent HS nomenclatures.

It is worth noting that while the approach based on model lists allows for comparative analysis, it may lead to apparently inconsistent results in specific instances when comparing the information in the model list to the applied tariffs for ITA members. This depends on, *inter alia*, different choices on transposition of ITA HS codes at the national level (WTO, 2012, p. 97[9]).[26]

For trade data extracted from the UN COMTRADE database, the automatic conversion function available in WITS is used for the transposition of HS codes, as the value of trade extracted therefrom closely tracks the value of trade extracted through the different model lists. Hence, the different models lists are mainly used to obtain tariff and trade data from the TRAINS database, as well as to undertake the CGE exercise using the METRO model.

## ITA Attachment B products

A further obstacle to the analysis of trade and tariffs on ITA products involves goods classified "in" and "for" Attachment B of the 1996 Ministerial Declaration, since these goods are either not identified by specific HS codes or subject to classification divergences (WTO, 2012[9]; WTO, 2017[12]; Anderson and Mohs, 2010[8]; Ezell and Wu, 2017[16]). Nevertheless, agreement was found on the classification of some of these products into specific HS categories in WTO decisions G/IT/27 of 2013 and decision G/IT/2016 of 2016.

For products "in" attachment B – not identified by specific HS codes in the original Ministerial declaration – Decision G/IT/27 of 2013 classifies Monitors and Optical disc storage units in HS1996 codes 847160 and 847170 respectively, and decision G/IT/2016 of 2016 classifies Computers in HS2007 codes 847130, 847141, 847149, and 847150. In order to compare product data across time, the transposition of Monitors and Optical disc storage units from HS1996 to other HS revisions is obtained using UN and WCO correlation tables. For computers, the transposition from HS2007 to HS1996 and HS2002 is obtained using the WTO document G/IT/W/40, while the transposition for HS2012 and HS2017 is obtained using UN and WCO correlation tables.

This approach, however, does not lead to the identification of additional HS 6 digits codes to those already covered in the existing model lists. For the category of products identified by both specific HS1996 codes and the notation "for" attachment B in the original Ministerial declaration, the original HS codes are used for identification[27].

## End-use categories

This chapter also differentiates goods according to their different end-uses. This classification is obtained through the correspondence key of the OECD BTDIXE database, which allows for the differentiation between capital goods, intermediate goods and goods destined for household consumption, among others.

### *ITA goods and ICT goods*

ITA goods are defined in this report as the unique HS 6-digits goods covered in the WTO Information Technology Agreement of 1996. In contrast, ICT goods are defined as the HS 6-digits list of goods that must be intended to fulfil the function of information processing and communication by electronic means, including transmission and display (OECD, 2011, p. 30[2]).

In broad terms, the Information Technology agreement covers computers, software, telecommunications equipment, scientific instruments and semiconductors as well as most of the parts and accessories of these products.[28] ICT goods include computers and peripheral equipment, communication equipment, consumer electronic equipment, electronic components and miscellaneous ICT goods (OECD, 2011, pp. 40-46[2]).

The total number of goods covered and the difference between the two product lists vary depending on the HS nomenclature. Taking the HS2007 nomenclature for illustrative purposes, ITA goods include a list of 112 unique HS codes whereas ICT goods include 95 unique HS codes. The main category of goods that is in the ICT list but not in the ITA list is consumer electronic equipment, which was carved-out of the ITA negotiation process (Fliess and Sauvé, 1997, p. 27[29]). Goods that are in the ITA list but not in the ICT list include electrical capacitors and resistors, insulated wire, cable and conductors, calculating machines, scientific equipment and semiconductor-related equipment. At the HS 6 digits level, the two lists mainly overlap in Computers and Peripheral Equipment (17 instances) and Electronic Components (15 instances).

### *ITA goods in the OECD METRO model exercise*

Translating the hypothetical tariff drop following ITA accession from the product-level to the sector level in METRO requires making use of a correspondence. The correspondence used in this exercise related goods in the HS2012 nomenclature to METRO sectors. On this basis, the trade-weighted average tariff drop is calculated based on the sectorial aggregation. The use of the ITA short list and long list leads to the differentiation between the lower bound estimate from the upper bound estimate in the exercise.

## Annex Table 3.A.1. MFN applied rates and value of ITA imports by HS chapter (4-digits), 2018

Sorted by MFN tariff rate (simple average, descending order), upper bound estimate of ITA trade, HS2017

| HS2017 Chapter | Average MFN duty | Imports in million USD | Chapter description | Number of ITA HS 6 digit products | Value as a hare of total ITA imports |
|---|---|---|---|---|---|
| 8519 | 20% | 0.00 | Sound recording or reproducing apparatus. | 1 | 0.00% |
| 8539 | 18% | 206.03 | Electric filament or discharge lamps, including sealed beam lamp units and ultra-violet or infra-red lamps; arc-lamps; light- emitting diode (LED) lamps. | 1 | 1.06% |
| 8504 | 17.44% | 606.20 | Electrical transformers, static converters (for example, rectifiers) and inductors | 2 | 3.12% |
| 8470 | 17.05% | 15.49 | Calculating machines and pocket-size data recording, reproducing and displaying machines with calculating functions; accounting machines, postage-franking machines, ticket-issuing machines and similar machines, incorporating a calculating device; cash registers. | 6 | 0.08% |

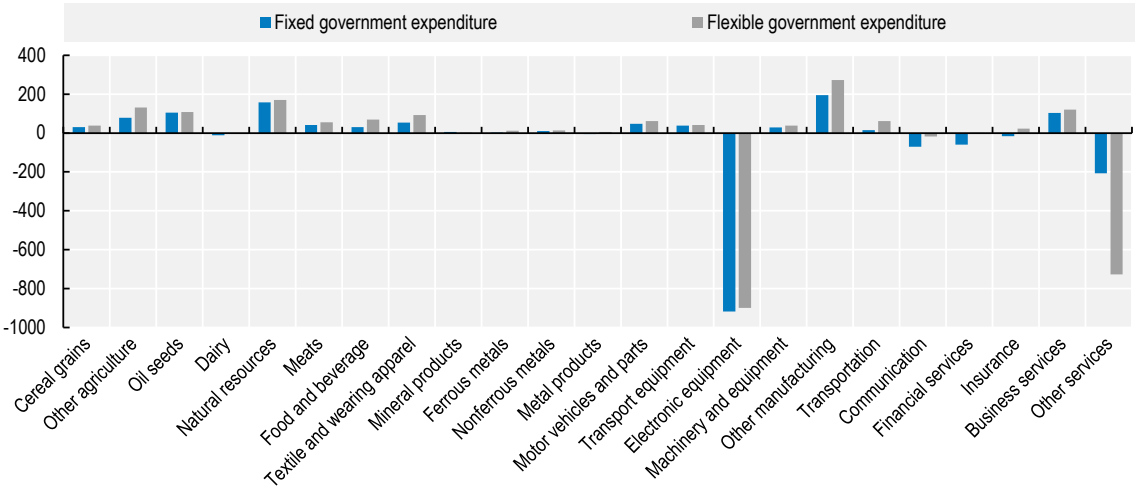
| HS2017 Chapter | Average MFN duty | Imports in million USD | Chapter description | Number of ITA HS 6 digit products | Value as a hare of total ITA imports |
|---|---|---|---|---|---|
| 9026 | 16.25% | 206.44 | Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases (for example, flow meters, level gauges, manometers, heat meters), excluding instruments and apparatus of heading 90.14, 90.15, 90.28 or 90.32. | 4 | 1.06% |
| 9620 | 16% | 2.24 | Monopods, bipods, tripods and similar articles. | 1 | 0.01% |
| 8548 | 15% | 0.93 | Waste and scrap of primary cells, primary batteries and electric accumulators; spent primary cells, spent primary batteries and spent electric accumulators; electrical parts of machinery or apparatus, not specified or included elsewhere in this Chapter | 1 | 0.00% |
| 8528 | 14.67% | 64.46 | Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus. | 3 | 0.33% |
| 8532 | 14.30% | 253.32 | Electrical capacitors, fixed, variable or adjustable (pre-set) | 9 | 1.30% |
| 8533 | 14.29% | 110.27 | Electrical resistors (including rheostats and potentiometers), other than heating resistors | 7 | 0.57% |
| 8544 | 14.17% | 455.32 | Insulated (including enamelled or anodised) wire, cable (including co-axial cable) and other insulated electric conductors, whether or not fitted with connectors; optical fibre cables, made up of individually sheathed fibres, whether or not assembled with electric conductors or fitted with connectors. | 3 | 2.34% |
| 8523 | 14.10% | 205.84 | Discs, tapes, solid-state non-volatile storage devices, ìsmart cardsî and other media for the recording of sound or of other phenomena, whether or not recorded, including matrices and masters for the production of discs, but excluding products of Chapter 37. | 7 | 1.06% |
| 8486 | 14% | 15.68 | Machines and apparatus of a kind used solely or principally for the manufacture of semiconductor boules or wafers, semiconductor devices, electronic integrated circuits or flat panel displays; machines and apparatus specified in Note 9 (C) to this Chapter; parts and accessories | 5 | 0.08% |
| 7020 | 14% | 24.33 | Other articles of glass. | 1 | 0.13% |
| 8531 | 14% | 52.18 | Electric sound or visual signalling apparatus (for example, bells, sirens, indicator panels, burglar or fire alarms), other than those of heading 85.12 or 85.30. | 1 | 0.27% |
| 8518 | 13.33% | 177.52 | Microphones and stands therefor; loudspeakers, whether or not mounted in their enclosures; headphones and earphones, whether or not combined with a microphone, and sets consisting of a microphone and one or more loudspeakers; audiofrequency electric amplifiers; electric sound amplifier sets. | 3 | 0.91% |
| 8517 | 13.00% | 4251.86 | Telephone sets, including telephones for cellular networks or for other wireless networks; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network), other than transmission or reception apparatus of heading 84.43, 85.25, 85.27 or 85.28. | 7 | 21.87% |
| 8471 | 12.29% | 1200.98 | Automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included. | 8 | 6.18% |
| 8529 | 12% | 2018.97 | Parts suitable for use solely or principally with the apparatus of headings 85.25 to 85.28. [Transmission apparatus for radio-broadcasting or television; Radar apparatus, radio navigational aid apparatus and radio; remote control apparatus; Reception apparatus for radio-broadcasting; Monitors and projectors] | 2 | 10.38% |

| HS2017 Chapter | Average MFN duty | Imports in million USD | Chapter description | Number of ITA HS 6 digit products | Value as a hare of total ITA imports |
|---|---|---|---|---|---|
| 8472 | 11.78% | 18.38 | Other office machines (for example, hectograph or stencil duplicating machines, addressing machines, automatic banknote dispensers, coin-sorting machines, coin-counting or wrapping machines, pencil-sharpening machines, perforating or stapling machines). | 1 | 0.09% |
| 8534 | 11.67% | 408.07 | Printed circuits | 1 | 2.10% |
| 9030 | 11.67% | 49.48 | Oscilloscopes, spectrum analysers and other instruments and apparatus for measuring or checking electrical quantities, excluding meters of heading 90.28; instruments and apparatus for measuring or detecting alpha, beta, gamma, X-ray, cosmic or other ionising radiations. | 3 | 0.25% |
| 9031 | 10.89% | 119.42 | Measuring or checking instruments, appliances and machines, not specified or included elsewhere in this Chapter; profile projectors. | 3 | 0.61% |
| 8536 | 10.89% | 691.55 | Electrical apparatus for switching or protecting electrical circuits, or for making connections to or in electrical circuits (for example, switches, relays, fuses, surge suppressors, plugs, sockets, lamp-holders and other connectors, junction boxes), for a voltage not exceeding 1,000 volts; connectors for optical fibres, optical fibre bundles or cables. | 3 | 3.56% |
| 8473 | 10.88% | 1057.65 | Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines of headings 84.70 to 84.72 | 5 | 5.44% |
| 8543 | 9.18% | 263.95 | Electrical machines and apparatus, having individual functions, not specified or included elsewhere in this Chapter. | 2 | 1.36% |
| 8443 | 7.35% | 766.68 | Printing machinery used for printing by means of plates, cylinders and other printing components of heading 84.42; other printers, copying machines and facsimile machines, whether or not combined; parts and accessories thereof | 4 | 3.94% |
| 9027 | 7.21% | 454.08 | Instruments and apparatus for physical or chemical analysis (for example, polarimeters, refractometers, spectrometers, gas or smoke analysis apparatus); instruments and apparatus for measuring or checking viscosity, porosity, expansion, surface tension or the like; instruments and apparatus for measuring or checking quantities of heat, sound or light (including exposure meters); microtomes. | 5 | 2.34% |
| 8525 | 5.71% | 99.08 | Transmission apparatus for radio-broadcasting or television, whether or not incorporating reception apparatus or sound recording or reproducing apparatus; television cameras, digital cameras and video camera recorders. | 1 | 0.51% |
| 3818 | 2% | 9.85 | Chemical elements doped for use in electronics, in the form of discs, wafers or similar forms; chemical compounds doped for use in electronics. | 1 | 0.05% |
| 8541 | 1.71% | 1025.51 | Diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, including photovoltaic cells whether or not assembled in modules or made up into panels; light-emitting diodes (LED); mounted piezo-electric crystals. | 8 | 5.27% |
| 8542 | 1.58% | 4611.10 | Electronic integrated circuits | 5 | 23.72% |

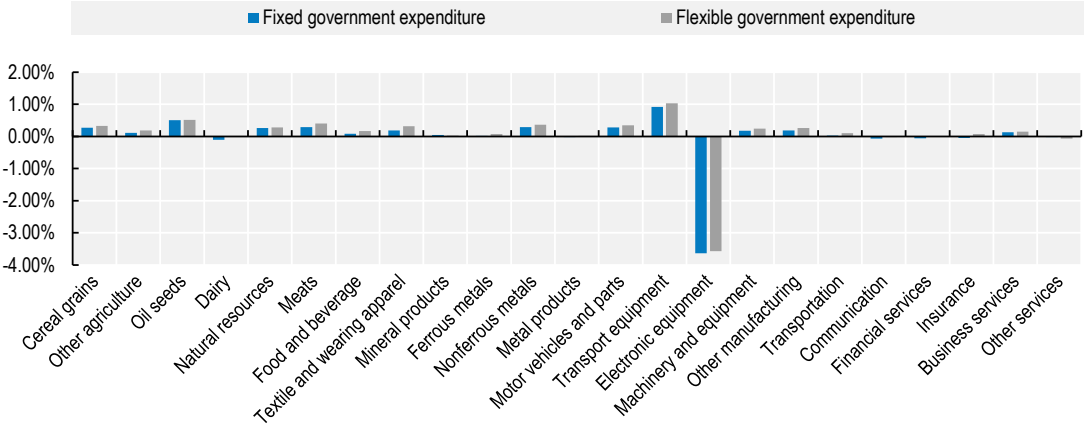
Source: Authors' calculations based on the TRAINS database.

## Annex Figure 3.A.2. With flexible government expenditure, the negative impact on 'Other services' would be more severe, although other economic activities would witness larger gains

a. Absolute changes in value added relative to the baseline scenario, by sector, USD million



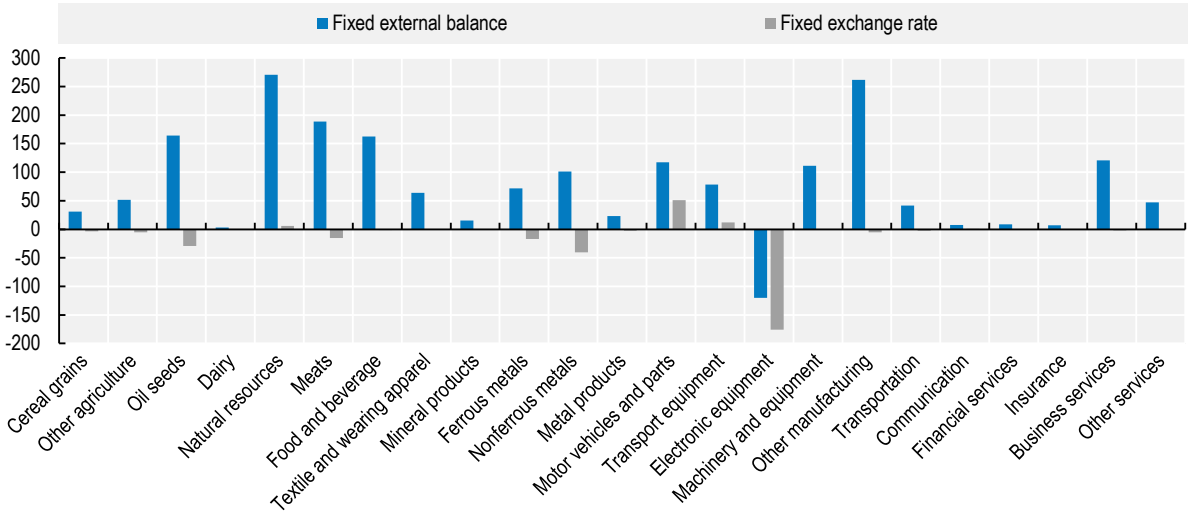

b. Percentage changes in value added relative to the baseline scenario, by sector



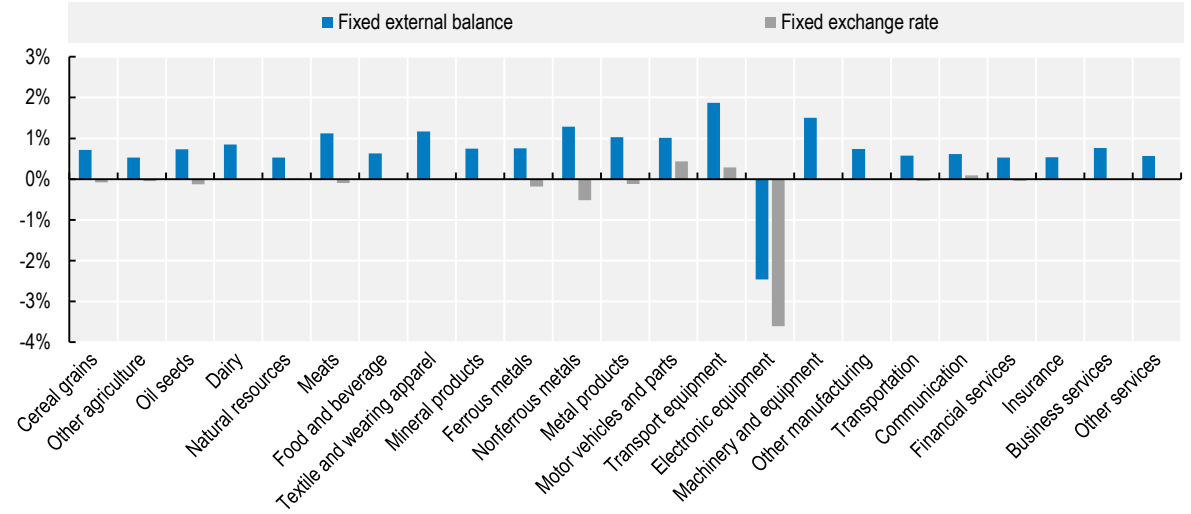

Note: Upper bound estimate. The figures compare a scenario in which Government expenditure is fixed and the external balance is fixed (blue bar) to one in which government expenditure is flexible and the external balance is fixed (grey bar). In the latter scenario, government expenditure decreases to reflect lower customs revenues, which means that households will not need to increase savings to compensate for greater debt. 'Fixed government expenditure' indicates the main model set-up used in the body of the chapter.

## Annex Figure 3.A.3. With a fixed exchange rate, export gains would be much reduced and remain positive only in few activities

a. Absolute changes in exports relative to the baseline scenario, by sector, USD million




b. Percentage changes in exports relative to the baseline scenario, by sector




Note: Upper bound estimate, government expenditure is fixed. The figures compare a scenario in which the trade balance is fixed and the exchange rate is flexible (blue bar) to one in which the trade balance is flexible and the exchange rate is fixed (grey bar). 'Fixed' trade balance indicates the main model set-up included in the body of the chapter.

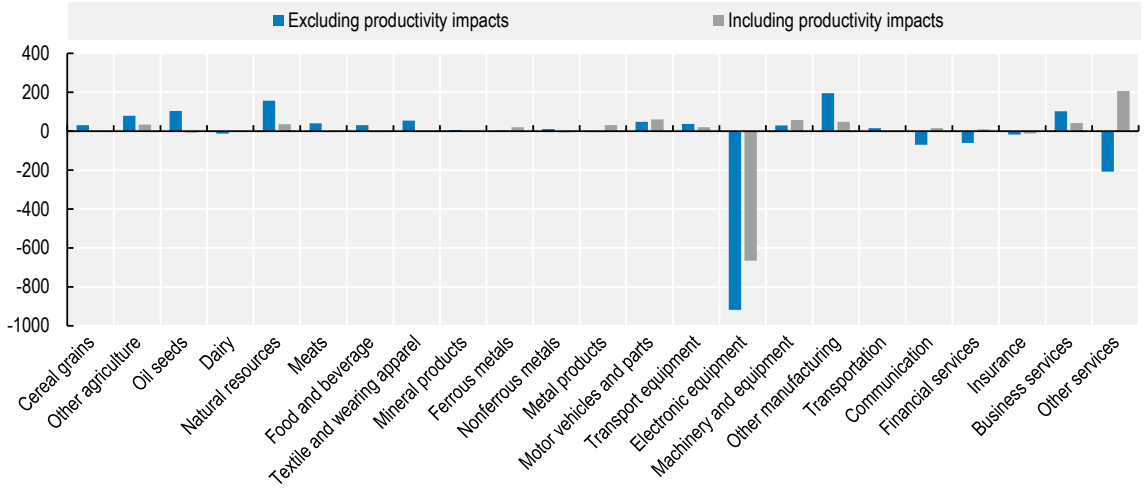
### *Testing the sensitivity of results to the ITA labour productivity shock*

Including the labour productivity enhancing effects of ITA accession in the METRO simulation would lead to more reduced gains in value added for most economic activities. Gains would mostly remain positive in manufacturing activities as well as some other sectors (Annex Figure 3.A.4), as manufacturing processes can more effectively benefit from greater labour productivity in related production activities and greater access to imported intermediate inputs. Greater household income and expenditure stemming from productivity gains in turn supports demand for some of the unrelated production activities (e.g. financial services and communication). Including the productivity shocks in the simulation also leads to a smaller

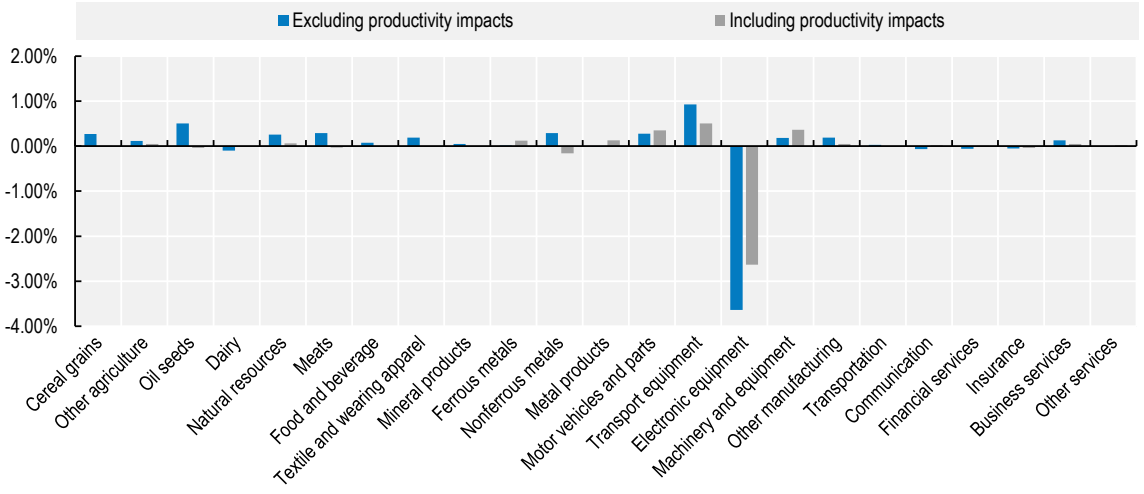
contraction of sectorial value added in the *electronic equipment* sector, and a smaller net value added decrease in total.

## Annex Figure 3.A.4. Value added gains are in most sectors are reduced when incorporating the productivity enhancing effects of ITA accession

a. Absolute changes relative to the baseline scenario, USD million




b. Percentage changes relative to the baseline scenario




Note: The figure compare a scenario where the productivity enhancing effects of ITA are not included (blue bar) to one when these impacts are included (grey bar).The benchmark elasticity of labour productivity with respect to tariffs equals -0.22. Government expenditure is fixed, the external balance is fixed.

As regards the other economic variables, imports of electronic equipment would still grow although in much smaller quantities (+1.2% instead of +7.6% in the absence of productivity dynamics). Bilateral imports of electronic equipment would grow from Argentina instead of declining (as the country would also experience analogous productivity dynamics) while trade reorientation effects would be much stronger for electronic equipment imports from Mexico, Latin America, South East Asia, and Korea.

Similarly to value added, export gains would mainly materialise in manufacturing activities, with most agricultural, primary and services activities bearing the consequences of greater competition for production factors (especially capital). Electronic equipment would also gain an important export share, which contrasts with its loss of export values in the absence of productivity effects, and as a reflection of a more productive domestic industry and subdued domestic prices.

It should also be noted that these effects are compounded by the METRO model set-up and closures in the factor market: the negative effects on activities outside manufacturing are reduced when allowing for unemployment in the model, which enables greater adjustment of production factors. Capital endowments are also not allowed to increase in the static model, while this would relax the production constraints due to fixed factor endowments.

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## Notes

[1] This chapter looks at the liberalisation of 1996 ITA goods as this covers most computers, telecommunication equipment and electronic components, while the ITA II agreement adds to the pre-existing agreement by deepening and broadening its scope, including for instance for some medical equipment and scientific instruments.

[2] Unless otherwise specified, IT goods refer to goods covered in the 1996 Information Technology Agreement.

[3] This could be explained by the carve-outs in the ITA on consumer electronic equipment (Fliess and Sauvé, 1997, p. 27[29]).

[4] Still against the background of falling prices (WTO, 2021[3]).

[5] Within MERCOSUR, the average MFN tariff on ITA goods varies significantly. MERCOSUR members appear to rely on a range of exceptions to the common external tariffs in their tariff schedules for ITA goods. Data from the tariff schedules of active MERCOSUR countries (Argentina, Brazil, Paraguay, Uruguay) in the NCM nomenclature reveal that MERCOSUR countries maintain a common MFN external tariff in only 155 of the 484 8-digits tariff lines containing ITA goods (upper bound estimate of ITA coverage), whereas at least one of the four countries makes use of exceptions in the remaining tariff lines. The issue of the tariff level on ITA goods is hence compounded by tariff perforation issues, as elsewhere reported by the World Bank (2019[31]) the Inter-American Development Bank (Laens and Terra, n.d.[30]), and the WTO (2017[32]). See the WTO trade policy review of Brazil (2017[32]) for a discussion of IT-related exceptions.

[6] Note that this is an upper bound estimate of the coverage of the ITA (Annex 3.A).

[7] This suggests that there may be gains in lowering tariffs to zero on some products that represent a high share of ITA imports while attracting relatively low tariff levels.

[8] Other caveats can be found in the ‘Limitations’ sub-section below.

[9] This is a consequence of the structure of the ITA (i.e. product ex-outs). The upper bound estimate includes all goods at the HS 6 digit level that can be considered as falling within the ITA, including those with product ex-outs (covered at the 8 or 10 digit level, for instance). The lower bound estimate only includes those goods that are fully covered by the ITA at the HS 6 digit level of aggregation. Note that the upper bound estimate does not include Appendix B goods, meaning that it may underestimate the maximum possible value of ITA imports. See the methodological annex for more information.

[10] See European Commission (2016[15]) for a similar modelling approach.

[11] Estimates for MERCOSUR accession are only based on Brazil and Argentina simultaneously lowering tariffs, as Uruguay and Paraguay cannot be separately identified in the OECD METRO model.

[12] The mineral product is HS 702000, ‘Other articles of glass’ included in the ITA model list with a product ex-out. In the original ITA agreement, these are ‘Quartz reactor tubes and holders designed for insertion into diffusion and oxidation furnaces for production of semiconductor wafers’ (HS1996: 701710).

[13] With the lower bound estimate interpretation of trade in ITA goods, the weighted average tariff in Brazil would fall by 20% in Electronic equipment and 4% in Machinery and Equipment; it would fall by 28% in Argentina for Electronic equipment and 3% in Machinery and Equipment.

[14] As the government keeps its current level of expenditure fixed, households will consume less and save more in order to compensate for increases in debt. This means they will spend less and *other services* is a key item of consumption for households.

[15] Information obtained from Brazil's Social Accounting Matrix (SAM) in METRO. *Communication services* and *financial services* also make up a relatively important share of household expenditure (4.86% and 4.03% of total expenditure respectively) while also showing a low degree of electronic equipment input use, which explains the observed value added contraction in those sectors.

[16] At the same time, flexible government spending in response to the tariff change would lead to a greater positive impact on other economic activities as adjustments to household savings rates would no longer be required to compensate for higher government debt, meaning that household consumption would be less affected (see Annex Figure 3.A.3 for a comparison of the two scenarios).

[17] In the current setting, the trade balance remains fixed following tariff liberalisation, while the exchange rate is left to adjust, which is more likely to reflect Brazil's response to ITA accession (Brazil maintains a floating exchange rate). Changing this assumption and fixing the exchange rate instead of the trade balance would lead to greater losses in *electronic equipment* exports, together with small net decreases in agricultural and primary sectors' exports (see Annex Figure 3.A.1. for comparison). Export changes would remain positive only in few activities (Annex 3.A).

[18] As regards the geographical distribution of exports, exports in dollar terms would grow mostly to China (USD +124 to USD 300 million), the United States (USD +116 to USD 285 million), the European Union (+USD 63 to USD 153 million) and the Rest of the World category (+USD 202 to USD 496 million). In relative terms, they would mostly grow to Mexico (+0.5% to 1.1% relative to the baseline value), South Africa (+0.4% to 1%) and Canada (+0.4% to 0.9%).

[19] For the estimated values, Brazil's medium-term GDP estimate relative to the elasticity of labour with respect to tariffs can approximately be described by the function $y = 0.91x - 0.03$, where $y$ represents real GDP growth in percentage terms and $x$ stands for the elasticity parameter (n.b., the curve is actually slightly downward sloping when looking at more specific decimals, with the coefficient of the $x$ varying from 0.9164 at elasticity equal to 0.05 to 0.91297 for elasticity equal to 0.3). This means that starting from an elasticity of labour productivity with respect to tariffs equal to 0.0325 (which implies in the model a 0.8% increase in labour productivity in electronic equipment and a +0.1% increase of labour productivity in other manufacturing equipment), Brazil would start observing positive GDP gains from ITA accession over the medium term (in the scenario with the fixed government expenditure closure).

[20] Upper bound ITA estimate. Households experience greater gains in expenditure and income when the simulation incorporates the productivity-enhancing effects of ITA accession, as they both benefit from greater factor remuneration and lower domestic prices. Using the benchmark estimate of -0.22 for the elasticity of labour with respect to tariffs, household welfare gains equal USD 675 million with fixed government expenditure (instead of USD -1.39 billion in the absence of productivity dynamics).

[21] Estimates are in a similar range for different government account closures and for the simulation incorporating the productivity enhancing effects of ITA accession.

[22]A more recent estimate from the OECD Global Revenue Statistics Database also shows that tariff revenue accounted for a minor share of total revenue, at about 1.8% of total taxation in both 2018 and 2019.

[23] HS 1996 codes 8424.99 and 8456.93 are corrected to 8524.99 and 8466.93 respectively. Although the ITA agreement did not yet enter into force at the Singapore Ministerial Conference, the final list of ITA goods has not been subject to substantial changes after the Ministerial Conference (Fliess and Sauvé, 1997, p. 30[29]).

[24] Attachment B products are also absent from this upper bound estimate.

[25] See http://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-system.aspx.

[26] This may also depend on, for instance, countervailing duties applied on goods that would otherwise attract zero tariffs, or on duties being different from zero as new members to the agreement are in the process of transitioning towards zero bound duties.

[27] ITA members can chose to classify ITA products “for” Attachment B in different product categories than those reported in the Ministerial declaration (G/IT/W/6/Rev.3).

[28] See https://www.wto.org/english/tratop_e/inftec_e/itaintro_e.htm.

# 4 Identifying the policy environment affecting digital trade

This chapter maps Brazil's evolving policy and regulatory environment for digital trade, placing Brazil in the broader regional context and benchmarking performance against international best practices. The chapter argues that, while Brazil has made good progress implementing a range of digital trade related policies, there are a number of areas where Brazil could further update rules and regulations to help boost participation in digital trade. These include reductions in restrictiveness across a range of services sectors that support the digital transformation and a wider engagement on digital trade issues in trade agreements.

## Key messages

- The regulatory and policy environment that underpins digital trade in Brazil has undergone important positive changes, however, it remains more restrictive than many OECD or G20 economies across a number of areas.
- Key regulatory challenges include reducing barriers to ICT infrastructure services and promoting more competition in order to incentivise investment in better quality communications services.
- Where goods are concerned, Brazil may want to consider increasing the level and scope of its *de minimis* regime, by making it applicable beyond postal shipments and also covering Business to Consumers (B2C) shipments.
- Brazil is increasingly active in digital trade and e-commerce discussions, but continued engagement and adoption of provisions, including in trade agreements, is needed to make the most out of digital trade.

## 4.1. Domestic policy and regulatory environment for digital trade

The regulatory environment in which digital trade takes place in Brazil is underpinned by a comprehensive set of laws and decrees (Table 4.1). In recent years, however, Brazil has been increasingly active in shaping the policy and regulatory environment in which digital trade takes place. For instance, in 2014, Brazil adopted Law No. 12.965, known as the Civil Rights Framework for the Internet (*Marco Civil da Internet*).[1] This was a major step towards building a regulatory framework for the digital era, strengthening citizens' rights to access to the Internet, and laying down basic principles, rights and obligations with respect to the use of the Internet. Since then, Brazil has adopted further decrees and laws that lay down rules for digital activities, including, a new general data protection law.

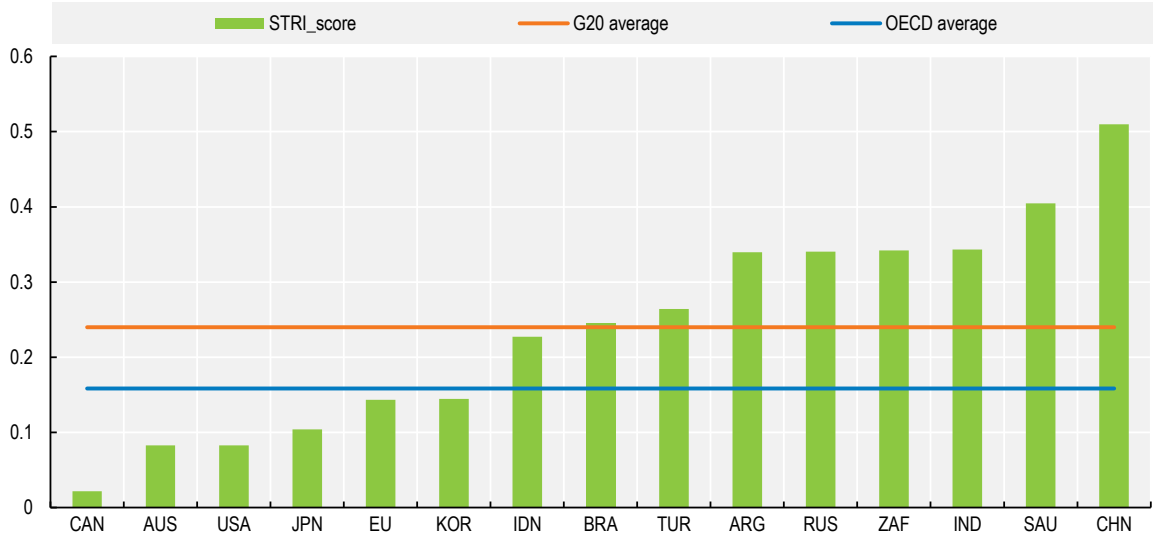
### Table 4.1. Overview of some key regulations affecting digital trade in Brazil

| Legislative instrument | Year |
|---|---|
| Law 7.232 Brazilian Informatics Policy (Lei que Dispõe sobre a Política Nacional de Informática, e dá outras providências) | 1984 |
| Law 8.078 Consumer Protection Law (Lei que dispõe sobre a proteção do consumidor e dá outras providências) | 1990 |
| Law 9.472 General Telecommunications Law (Lei que dispõe sobre a organização dos serviços de telecomunicações, a criação e funcionamento de um órgão regulador e outros aspectos institucionais) | 1997 |
| Law 9.610 Changes, Updates and Consolidates the Law on Copyright (Lei que altera, atualiza e consolida a legislação sobre direitos autorais) | 1998 |
| Decree 7.962 Regulating Law 8.078 Establishing Specific Rules Applicable to Electronic Commerce in Brazil (Decreto 7.962 Regulamenta a Lei nº 8.078, para dispor sobre a contratação no comércio eletrônico) | 2013 |
| Law No. 12.965 Establishing Principles, Guarantees, Rights and Duties for the Use of the Internet in Brazil (Lei No. 12.965 Estabelece princípios, garantias, direitos e deveres para o uso da Internet no Brasil) | 2014 |
| Decree 8.771 Regulating Law No. 12.965/2014 (Decreto No. 8.771 Regulamenta a Lei nº 12.965, de 23 de abril de 2014) | 2016 |
| Law 13.709 General Law on the Protection of Personal Data (Lei Geral de Proteção de Dados Pessoais) | 2020 |

While building the foundation of a robust regulatory framework for digital trade has been progressing rapidly over the past years, the overall regulatory environment affecting cross-border digital trade, as measured by the OECD's Digital Services Trade Restrictiveness Index (DSTRI), remains more cumbersome than the OECD average although in line with other G20 economies (Figure 4.1). This is due to a range of regulations discussed at greater length in this section.

## Figure 4.1. Regulatory bottlenecks undermine cross-border digital trade in Brazil

OECD Digital Services Trade Restrictiveness Index, 2020



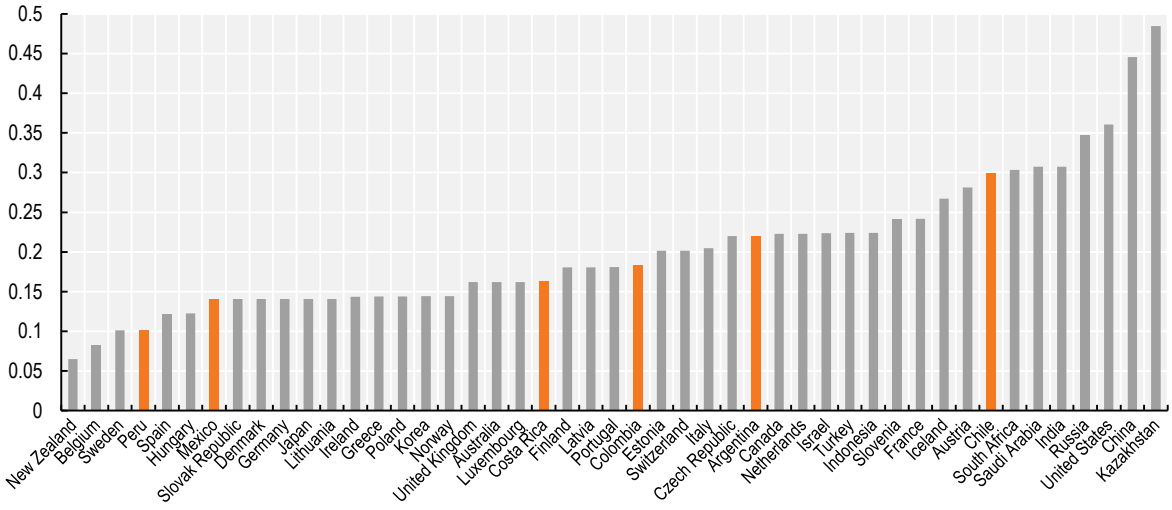

Note: The Digital STRI indices take values between zero and one, one being the most restrictive. Scale adjusted to 0.6. The values for the EU represent the average value for EU countries covered in the STRI.
Source: OECD Digital STRI database, 2020.

Moreover, the regulatory environment is also highly heterogeneous compared to that of other countries, particularly regional trading partners (Figure 4.2).[2] Brazil's digital trade regulations are most similar to those of Peru and Mexico and, to a lesser extent, to Costa Rica and Colombia in the region, while regulatory heterogeneity is significantly higher with respect to Argentina and Chile. By contrast, Brazil's regulatory environment is more closely aligned with that of European Union countries. This is likely to be further accentuated with the recent entry into force of the new General Data Protection Law (*Lei Geral de Proteção de Dados Pessoais*), which appears to be similar in structure to the EU's General Data Protection Regulation (GDPR).[3]

To better understand the evolving environment in Brazil, the next sections will look closer at the different policy areas relevant to digital trade. These include regulations affecting ICT infrastructure, measures affecting cross-border data flows and data localisation, enablers such as payments and intellectual property rights, policies related to trade facilitation measures (e.g. *de minimis* and customs procedures), and policy implications at the intersection between trade and competition.

## Figure 4.2. The regulatory environment for digital trade differs from that of regional trade partners

Digital STRI Regulatory heterogeneity indices for Brazil, 2020




Note: The indices show the level of regulatory heterogeneity between Brazil and each country in the figure. Lower index values indicate closer regulatory similarity whereas higher index value show more regulatory heterogeneity.
Source: OECD Digital STRI Heterogeneity index, 2020.

### *4.1.1. Cumbersome trade regulations on telecommunications and broadcasting services can undermine the quality of service provision to Brazilian customers*

Information and communication technology (ICT) services form the backbone of the digital economy. Not only do they provide the necessary network infrastructure for economic and social activities, they also underpin the digitisation of other sectors. Policies that encourage competition and investment in telecommunication services are essential to unlock the full potential of the digital transformation.

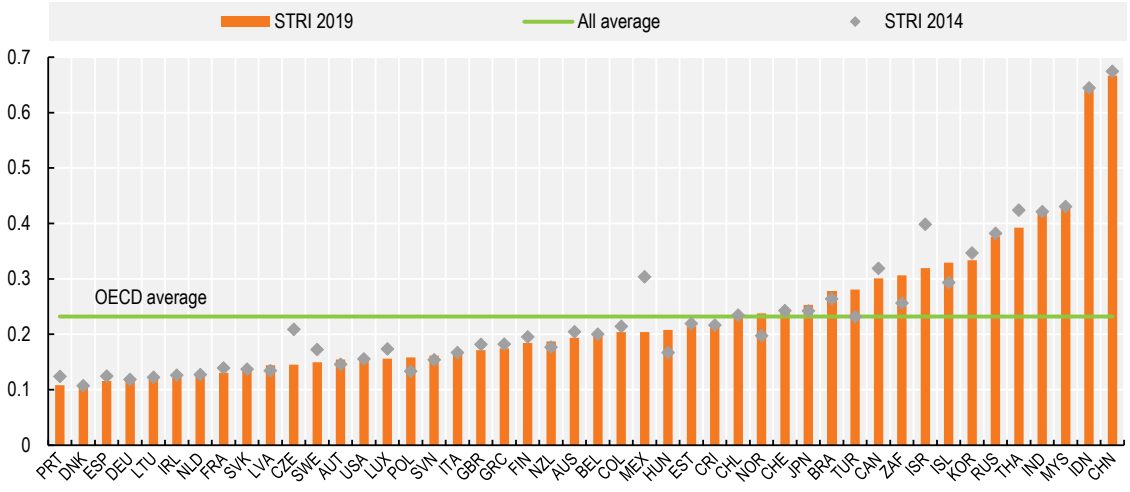
However, Brazil's telecommunications sector is more restrictive than the OECD average and that of regional partners such as Colombia, Costa Rica, or Chile. Impediments related to conditions for setting up telecommunication companies by foreign providers as well as certain barriers on competition related to resale of public telecommunications services, spectrum allocation, and transparency on the conditions for accessing the incumbent provider's network are among the barriers that contribute to higher index values. This matters because more restrictive telecommunications services are associated with less affordable internet access (Figure 4.3).

Recent years have seen convergence of telecommunications, information services and broadcasting where content can be delivered over different networks (OECD, 2017[1]). Telecommunications operators can offer Internet Protocol Television (IPTV), broadband and telephone (fixed, mobile or VoIP), while in some cases broadcasters have become telecommunications operators.

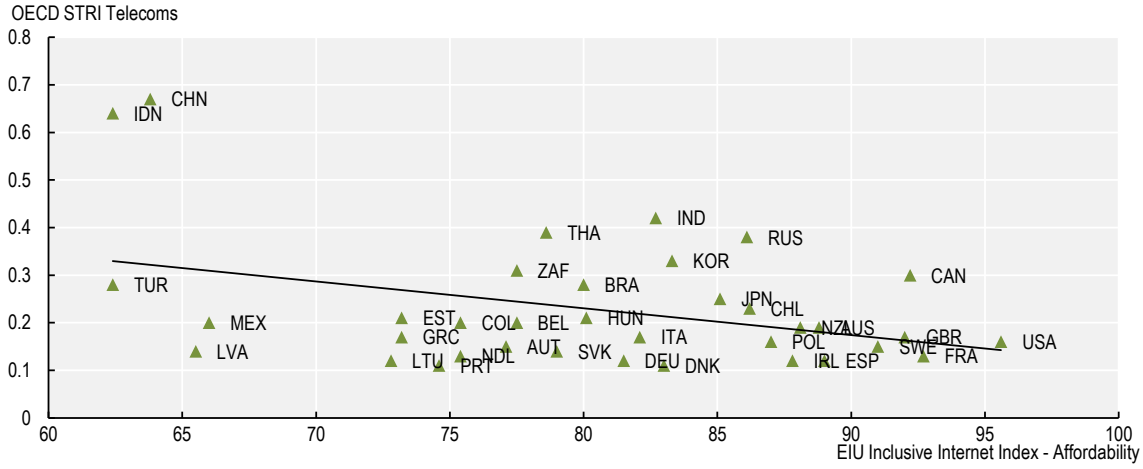
In addition, video-on-demand, streaming, and downloads have become increasingly important for distribution of audio-visual content, increasing demand for access to high-speed broadband. The supply of these services depends on the performance and regulation in the telecommunications sector. By the same token, a vibrant IPTV and online content market creates demand for broadband internet services.

## Figure 4.3. Barriers to telecommunications remain high in Brazil, affecting affordability of services

a. STRI score for Telecommunications Services (2014 and 2019)




b. Correlation between Telecommunication services STRI and internet affordability

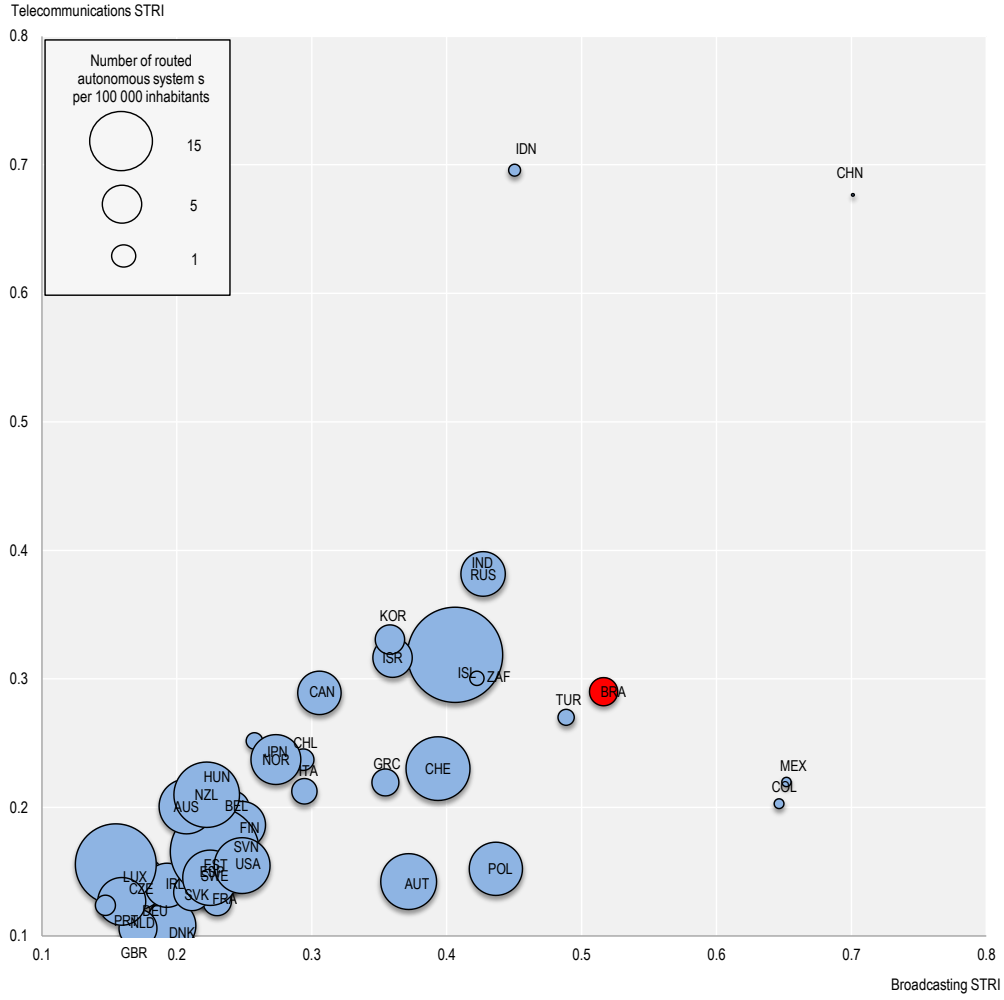



Note: Telecoms regulation is identified using the OECD STRI for the telecoms sector in 2019. The indicator ranges from 0 to 1 with higher values reflecting higher degrees of restrictiveness. The 2020 Economist Intelligence Unit (EIU) Inclusive Internet Index ranges from 0 to 100, with higher values reflecting a more inclusive Internet environment.
Source: OECD (2020[2])

Countries tend to have similar levels of trade restrictions in telecommunications and broadcasting services, both of which are generally considered to be of strategic importance (Figure 4.4). At the same time, countries that tend to have a high level of restrictiveness in both services sectors, also tend to have fewer autonomous systems per 100 000 inhabitants (indicating the ease with which a company may take control over routing its traffic and exchange this traffic with other networks), which may be a good proxy for the lower level of competition in the market (OECD, 2017[1]).

## Figure 4.4. Lowering trade barriers can boost performance for communication infrastructure services

OECD Services Trade Restrictiveness Index for telecommunications and broadcasting services, 2020




Note: Indices take values between zero and one, one being the most restrictive. Scale adjusted to 0.7.
Source: OECD STRI database, 2020.

In broadcasting services, Brazil is the fourth most restrictive country after China, Mexico, and Colombia. This is due to stringent market entry conditions for foreign broadcasters in the Brazilian market such as low maximum thresholds for foreign equity ownership or nationality requirements for managers of broadcasting companies. In addition, quotas on broadcast time and local content requirements related to production of programs, cast and crew also affect the conditions of trade in this sector.

Lowering barriers in these sectors could improve the regulatory and policy environment for communications infrastructure services such as telecommunications and broadcasting services. More competition from foreign services suppliers in these critical enabling sectors for digital trade would further enhance performance, incentivise investment in better communications infrastructure and high-speed broadband, and foster lower prices for consumers and downstream business users.

### *4.1.2. Balanced rules on cross-border data flows can help Brazilian firms maximise the benefits of technological innovations*

With the growing digitisation of information, increasing computer processing power and broader penetration of high-speed Internet connections, the ability of firms to collect, transfer and process data has increased significantly. As a result, the movement of data across borders has become an essential component of digital trade, be this as an input into the trade and production of goods or as a driver of new types of data-driven services. At the same time, the growth in use of data has accentuated concerns related to privacy and security, especially when data crosses different jurisdictions. This has led many countries to update or adopt new measures often affecting the movement of data across borders or mandating that data is stored domestically (Casalini and López González, 2019[3]). For trade, it is important that restrictions on the movement of data undertaken for legitimate reasons take into consideration good regulatory principles such as transparency and non-discrimination, and they aim to be as least trade restrictive and interoperable as possible (Casalini, López González and Moïsé, 2019[4]).

In 2014, the *Marco Civil da Internet* (Law No. 12,965) and its regulatory decree (Decreto No. 8,771) created the first regulatory framework for automated processing of personal data in Brazil. This law and its decree included specific principles on the protection of personal data (e.g. on confidentiality, security and access limitation) and required consent to carry out transfers of personal data outside of Brazil.

In 2018, Brazil enacted the Brazilian General Data Protection Law (*Lei Geral de Proteção de Dados Pessoais*: LGPD) under Federal Law No. 13,709/2018 which entered into force on 18 September 2020. A key purpose of this law was to create a comprehensive framework applicable to all personal data processing operations, regardless of the sector and of the nature of the entity undertaking its processing.[4] The LGPD uses similar language to that found in the OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data.[5] As such, *personal data* is understood to be all information related to an identified or identifiable natural person. *Data controllers* are defined by their capacity to decide on the processing of personal data, and international transfer of personal data means the transfer of personal data to a foreign country. The LGPD introduces a new approach to international transfers of personal data compared with the *Marco Civil da Internet*. The LGPD prohibits international transfers of personal data unless adequate safeguards are in place. Specific safeguards such as standard contractual clauses, binding corporate rules or stamps, certificates and codes of conduct are recognized as mechanisms that provide adequate protection for personal data sent abroad (Article 33.II).

In addition to specific safeguards, transfers of data to countries whose legislation is recognised as providing *adequate* protection is permitted without restrictions. Adequacy decisions will be made by the Brazilian Data Protection Authority (*Autoridade Nacional de Proteção de Dados* – ANPD), after consideration of the general and sectorial rules of the legislation in force in the country of destination. As of today, and given the very recent implementation of the regulation, the ANPD has not pronounced any adequacy decision.

The ANPD will play an important role in enabling international transfers of personal data as it will be in charge of making adequacy decisions on the degree of data protection of other countries and defining the conditions for international data transfers when adequacy is not established.[6] The ANPD's regulatory structure was established by Decree No. 10,474[7] and includes the Board of Directors (the main decision-making body), the National Council for the Protection of Personal Data and Privacy (an advisory body) and other specific and sectorial bodies. The members of the Board of Directors are designated by the President of the Republic, after approval by the Senate, and the advisory body includes five members from the federal executive branch (out of 23 members)[8].

The ANDP is currently established as a federal public administration body, part of the Presidency of the Republic. The law provides however that the legal nature of the ANDP is transitory and may be transformed into an indirect federal public administration body (*entidade da administração pública federal indireta*) subject to a special autonomous regime. In July 2021,[9] ANPD Governance Committee was set up to define

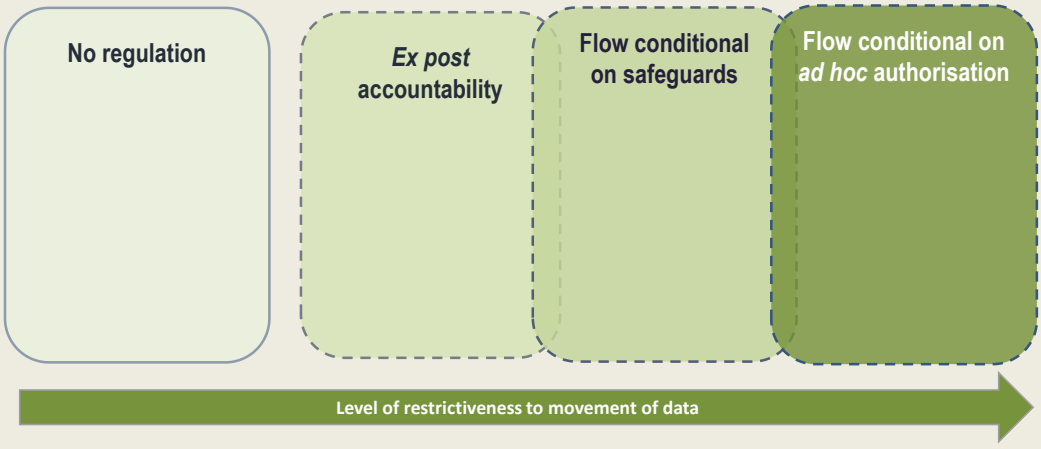
institutional strategies and transversal strategic guidelines on: (i) public governance; (ii) risk management, transparency and integrity in the ANPD; (iii) planning; (iv) internal control mechanisms; and (v) efficiency in administrative management with the purpose of ensuring the effectiveness and reliability of monitoring, and compliance with provisions relating to the Authority.

Brazil's new framework for cross-border data transfers follows trends across a range of countries. The LGDP falls in the category of 'flow conditional on safeguard', an approach that has many commonalities with countries such as those in the European Union or Argentina (Box 4.1) but it is relatively different to the approach taken by certain APEC countries including the United States. These rely on '*ex post* accountability' mechanisms which do not prohibit the transfer of data abroad but makes firms accountable for misuse.

### Box 4.1. Indicative taxonomy of approaches to cross-border data flows

Although approaches to cross-border data transfers differ across countries, they can be broadly grouped into four categories, albeit with blurred boundaries (Figure 4.5). These are not mutually exclusive; different approaches can apply to different types of data even within the same jurisdiction (health data, for instance, might be subject to more stringent approaches than data related to product maintenance).

### Figure 4.5. Indicative taxonomy of approaches to cross-border data flows



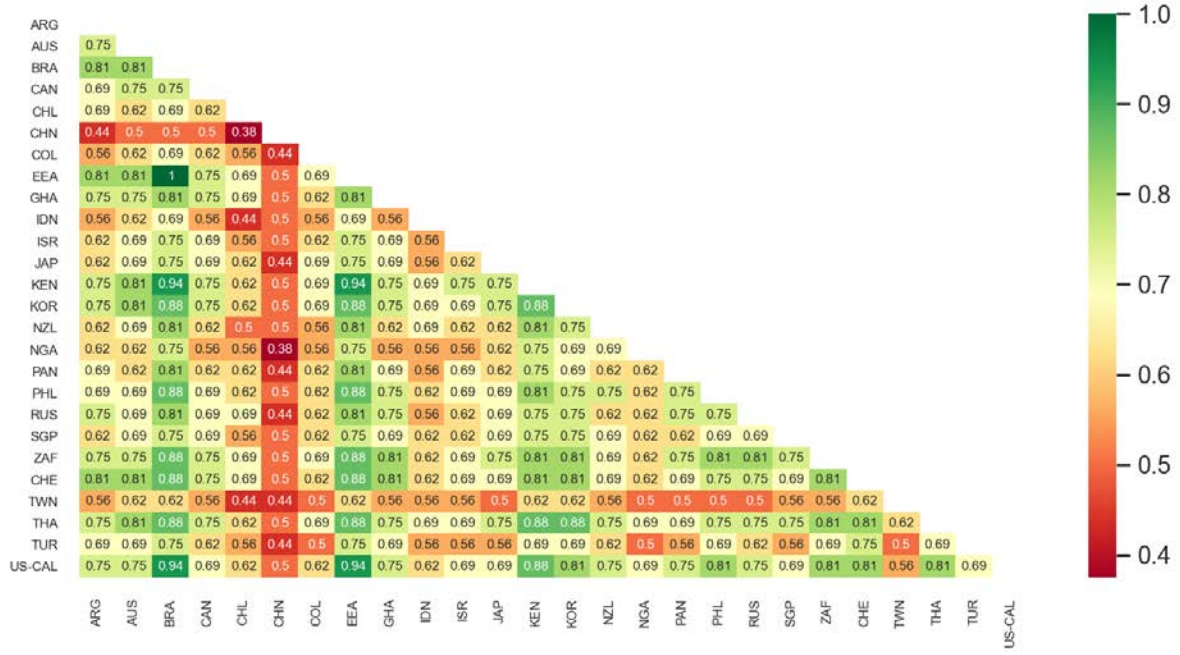

Source: Adapted from López González and Casalini (2019[5]).

- At one extreme, there is no regulation of cross-border data flows, usually because there is no data protection legislation at all. While this implies no restrictions on the movement of data, the absence of regulation might affect the willingness of others to send data
- The second type of approach does not prohibit the cross-border transfer of data nor does it require any specific conditions to be fulfilled, but provides for *ex post* accountability for the data exporter if data sent abroad is misused (e.g. firms send data but if something goes wrong they are legally accountable).
- A third approach, flows conditional on safeguards, includes approaches relying on the determination of adequacy or equivalence as *ex ante* conditions for data transfer. These rulings can be made by a public authority or by private companies and can include requirements about how data is to be treated. Where an adequacy determination has not yet been made, firms can move data under options such as binding corporate rules, contractual clauses and consent.

- The last broad type of approach, flow conditional on *ad hoc* authorization, relates to systems that only allow data to be transferred on a case-by-case basis subject to review and approval by relevant authorities. This approach relates to personal data for privacy reasons but also to the more sweeping category of "important data", including in the context of national security.

Indeed, the LGPD shares commonalities with the European Union's General Data Protection Regulation (GDPR) – Regulation 2016/679. It includes principles applicable to all processing operations, the rights recognized to data subjects and the mechanisms for enabling international transfers of personal data. However, the LGPD may have wider exceptions than the GDPR (Figure 4.6).[10]

## Figure 4.6. Brazil approaches privacy and personal data protection in a similar way than many, including the European Union




Note: Overlap measures the extent to which country pairs contain similar privacy and personal data protection principles in their regulation (without prejudice to different approaches to, and degrees of, enforcement). Colours capture range of overlap with red showing low overlap and green showing higher overlap. Table up to date until December 2020. New rules on personal data protection are under discussion in many countries, including in Chile and China.
Source: Casalini, López González and Nemoto (2021[6]).

The LGPD also brings Brazil's data transfer legislation closer to that of other countries in the region such as Argentina and Uruguay. Argentina and Uruguay have been declared the European Union as providing adequate protection.[11] The Colombian supervisory authority, the *Superintendencia de Industria y Comercio*, declared the European Union, Mexico, Korea, Costa Rica, Serbia, Peru, Norway, Iceland, and the United States (with respect to the EU-US Privacy Shield) Adequate. None of these countries have declared Brazil's legislation adequate, however, the LGPD might help initiate discussions on facilitating cross-border data flows with these countries.[12] For the time being, these countries have other mechanisms that enable the transfers of personal data such as binding corporate rules, standard contractual clauses or other certification schemes.

By contrast, the United States and Mexico have different "*ex post* accountability" approach to cross-border data flows. In the United States, data may generally flow freely except for specific exceptions (e.g. health data). In Mexico, transfers are conditioned on having obtained the consent of the data subject as well as having in place contractual arrangements between the data controller and the data recipient.

The ANPD may benefit from providing clear guidelines on applicable rules for the transfer of personal data to countries that have not been declared adequate. It might want to define the content of standard contractual clauses, and publish guidelines on the requirements for binding corporate rules, certifications and standards. According to ANPD's regulatory agenda,[13] the Authority will publish its regulation for international data transfer in June 2022. This is expected to provide further legal certainty to new investments and actors.

Brazil is also party to a number of plurilateral arrangements where discussion on privacy and data protection, including in the context of cross-border data flows, are taking place. Brazil takes part in Convention 108+, the Global Privacy Assembly (GPA), the Global Privacy Enforcement Network (GPEN) and is also in the Iberoamerican Data Protection Network. Brazil has also signed bilateral Memoranda of Understanding to enable further cooperation (in October 2021 with the *Agencia Española de Protección de Datos* (AEPD). In October 2021, ANPD published Information Security Guide for Small Agents with simplified standards and procedures for small and medium businesses, including startups and innovation companies, all with the aim of encouraging adjustment to the LGPD.

Although the LGPD creates a uniform regulatory framework that applies to all sectors of the economy, a number of sectorial regulations might affect the movement of data across borders. For instance, Resolution Nº 4.893 of the National Monetary Council[14] provides that financial institutions may only hire data processing, data storage and cloud computing services from companies residing in countries with which the Brazilian Central Bank has a data exchange agreement. If no data exchange agreement exists, a specific authorization from the Central Bank is necessary for each provider.

Restrictions to the movement of data can also arise from local storage requirements. These mandate that data is stored, and sometimes processed, domestically. Such requirements are increasingly regulated under trade agreements with a view to avoiding arbitrary or unjustifiable discrimination or disguised restrictions to trade. For example, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) provides that *"no party shall require a covered person to use or locate computing facilities in that Party's territory as a condition for conducting business in that territory"* (Article 14.13).[15] The Brazil-Chile trade agreements also includes a similar provision specifying that one party to the agreement may not require a person from the other party to use or locate computer facilities in the territory of that party as a condition for conducting business there[16] (Section 4.2).

These instruments do not, however, prevent any party from adopting or maintaining other measures to achieve a legitimate public policy objective, provided that the measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination, or a disguised restriction to trade. The CPTPP also adds that those legitimate measures shall not impose restrictions on the use or location of computing facilities greater than what is required to achieve the objective.

### *4.1.3. Facilitating cross-border online payments can boost online consumption*

Access to and use of efficient payment systems is key to enable seamless online transactions. Policy can play an important role in creating an environment that is conducive to promoting innovation in financial services and enabling new digital payment methods. Removing regulations that hamper innovation and create entry barriers to new firms can help increase competition and promote better quality services at lower prices for customers.

The regulatory environment in Brazil is generally conducive to online payment solutions and various foreign payment services providers already operate in the country, including Paypal, Samsung Pay, Google Pay

and Apple Pay. Law 12,865 regulates the Brazilian Payment System, including payment schemes and payment institutions. This law includes a broad definition of payment schemes and payment institution with the objective of modernising retail payment in Brazil. This law also sets the rules for the safe provision of payment services while encouraging competition and the entry of new players to enable the emergence of more competitive and efficient models.

Brazil has recently introduced new regulatory initiatives to foster innovation in the banking sector. One of these initiatives is the implementation of open banking in Brazil. Open banking is defined by the Central Bank of Brazil as *"the sharing of data, products and services by financial institutions and other licensed institutions, at the customers' discretion as far as their own data is concerned, through the opening and integration of platforms and infrastructures of information in a safe, agile and convenient manner"*.[17] The purpose of this initiative is to enhance the efficiency in credit and payments markets in Brazil by promoting a more inclusive and competitive business environment, while preserving the security of the financial system and ensuring consumer protection. The first phases of the implementation of the Open banking initiative have already started and the full roll-out of the project is expected for the first half of 2022.[18]

Another innovative regulatory approach is the implementation of instant payments. This ecosystem aims at enabling innovation, the emergence of new business models and the reduction of social costs related to the use of paper-based instruments. The Brazilian Central Bank Communication Nº32,927 on the fundamental requirements for instant payment ecosystems states that this ecosystem must be efficient, competitive, secure, inclusive and adapted to all use cases.[19] Implementation of this ecosystem is in line with the increase of non-cash transactions and the use of "e-wallets" (*carteira digital*) (Capgemini Research Institute, 2019[7]).

### *4.1.4.* ***Intellectual property rights***

Digitalisation brings new challenges for the effective protection and enforcement of intellectual property rights (IPR). Protecting copyrights and related rights are increasingly difficult as content such as music, movies, games and other media can be easily copied and distributed online. Other IPRs such as trademarks, patents and designs support product branding and protect innovative products and services.

Brazil's intellectual property framework is currently composed of three main laws, the Industrial Property Law (Law Nº9.279[20]), the Copyright Law (Law Nº9.610[21]), and the Software Law (Law Nº9.609[22]). The Industrial Property Law regulates trademarks, patents, utility models, industrial designs and geographical indications. The Copyright Law regulates author's rights, including moral rights while the Software Law provides for a specific copyright regime applicable to computer programs.

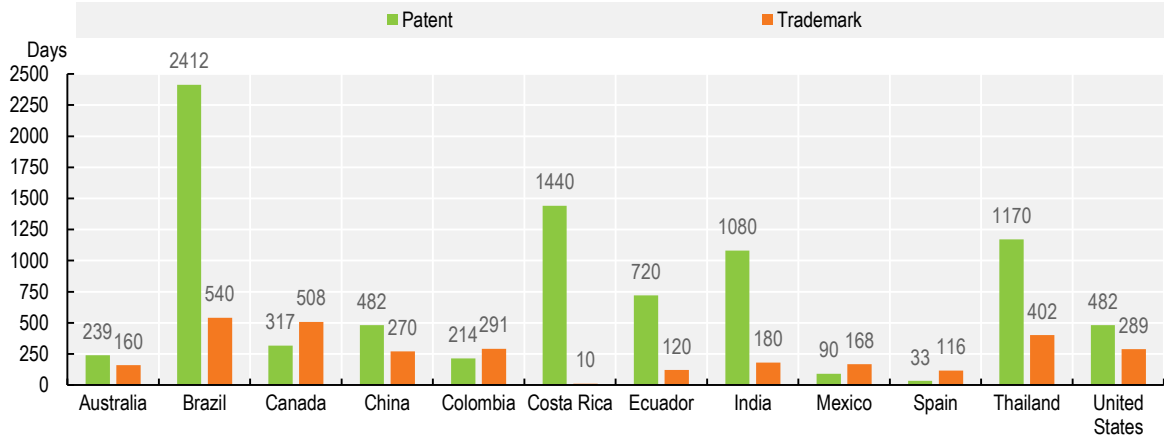
Brazil's current legislation covers all major aspects contained in the WTO TRIPS Agreement (WTO, 2017[8]). Regarding the protection of industrial property, Brazil is signatory to most major international agreements including the Paris Convention for the Protection of Industrial Property, the Patent Cooperation Treaty (PCT), and the Strasbourg Agreement Concerning the International Patent Classification. In 2019, Brazil joined the WIPO-administered international trademark system (the Madrid system) that provides for trademark protection in a large number of countries. Regarding copyright protection, Brazil is part of the Berne Convention for the Protection of Literary and Artistic Works and of the United Nations Universal Copyright Convention.

Brazil has not, however, signed a number of key WIPO instruments such as the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT).[23] The WCT deals with the protection of works and the rights of their authors in the digital environment as well as with the protection of computer programs and compilations of data ("databases"). Both computer programs and databases are protected as literary and artistic works. Ratification of this treaty, which already has 107 contracting parties, including other Latin American countries such as Argentina, Chile, Colombia and Mexico, would further enhance copyright protection and enforcement in Brazil. The WPPT deals with the rights of two

kinds of beneficiaries, particularly in the digital environment: (i) performers (actors, singers, musicians, etc.); and (ii) producers of phonograms (persons or legal entities that take the initiative and have the responsibility for the fixation of sounds). The WPPT also counts 106 contracting parties, including most countries in the region such as Argentina, Chile, Colombia, Costa Rica, Ecuador, Paraguay, and others.

One of the main challenges Brazil is facing is lengthy pendency times for patent and trademark applications (Figure 4.7). Following the WIPO World IP indicators, in 2018, Brazil's average pendency times for patent application (from request for examination to the first office action) was 80.4 months, which far exceeds other countries such as India (36 months), Ecuador (24 months), China (15.4 months), United States (15.4 months), Colombia (7.1 months) or Mexico (3 months). For trademark applications, the pendency time from filing to final decision is 18 months. This pendency time also exceeds that of other countries in the region such as Canada (16.9 months), Ecuador (4 months), China (9 months), Colombia (9.7 months), Mexico (5.2 months) and United States (9.6 months).[24]

## Figure 4.7. Pendency time for patent and trademark examination, 2018




Note: This chart builds from data from the WIPO Statistics Data Center and reflects pendency time for patents, from request for examination to the first office action and for trademarks, from filing to final decision. WIPO collects data from IP offices using a common questionnaire and methodology. However, due to differences in patent procedures between offices, data cannot be fully harmonized. Therefore caution should be exercised when making comparisons across offices.
Source: Authors' elaboration, data from the WIPO IP Statistics Data Center, https://www3.wipo.int/ipstats/index.htm?tab=patent

Cutting down processing delays and reducing the existing backlog of applications has become a priority for the National Institute of Industrial Property (INPI) (WTO, 2017[8]). A specific program was enacted in August 2018 to combat backlog in the examination of patent applications. The Patents Direction of the INPI committed to reduce the backlog of 149 000 applications by 80% in two years.[25] A similar effort is also being carried out to reduce backlog of trademark examination and to fully roll out the Madrid system.

Brazil is part to bilateral agreements between patent offices to promote cooperation and work-sharing under, in particular, the Patent Prosecution Highway Pilot initiative. The INPI has signed Patent Cooperation Treaties with national patent offices, such as USPTO (US), JPO (Japan), EPO (European Patent Office), SIPO (China), UKIPO (UK), DKPTO (Denmark) and PROSUL Patent Institutes (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Paraguay, Peru and Uruguay).[26] These initiatives accelerate patent examination by reusing search and examination results carried out by partner offices.

### *4.1.5. Creating an enabling environment for digitally ordered goods*

One important facet of the evolving digital trade environment is the growth in trade in digitally ordered goods, many of which are shipped in individual consignments (López González and Sorescu, 2021[9]). *Trade in parcels* allow individuals to access the goods they need in times of COVID-19 where physical distancing is needed (OECD, 2020[2]) and can be an important mechanism for Brazilian firms, especially smaller ones, to engage in trade (Chapter 2). In this respect, the extent to which goods are able to move to and from the border as well as the mechanics of getting these across the border can be important determinants of parcel trade.

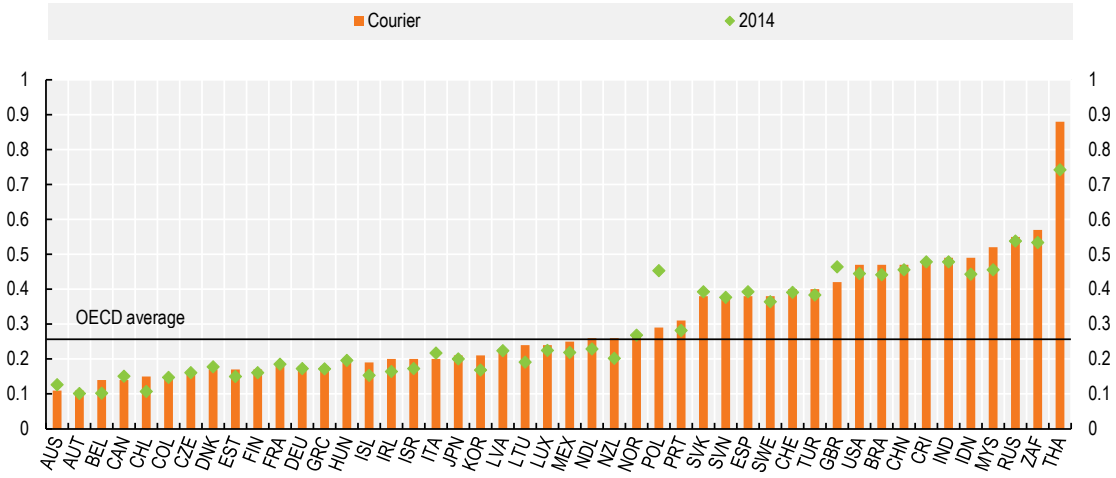
Indeed, recent empirical analysis suggests that progress on digital connectivity and trade facilitation measures, such as increased transparency or automating border processes, can have a greater trade-enhancing impact on parcel trade than on "traditional" trade. By contrast, greater differences in regulations across countries in transportation, courier or logistics services are associated with lower trade in parcels (López González and Sorescu, 2021[9]). Enabling benefits from trade in parcels requires a comprehensive policy approach across a number of areas and throughout the parcel supply chain.

#### *Receiving goods and getting them to and from the border*

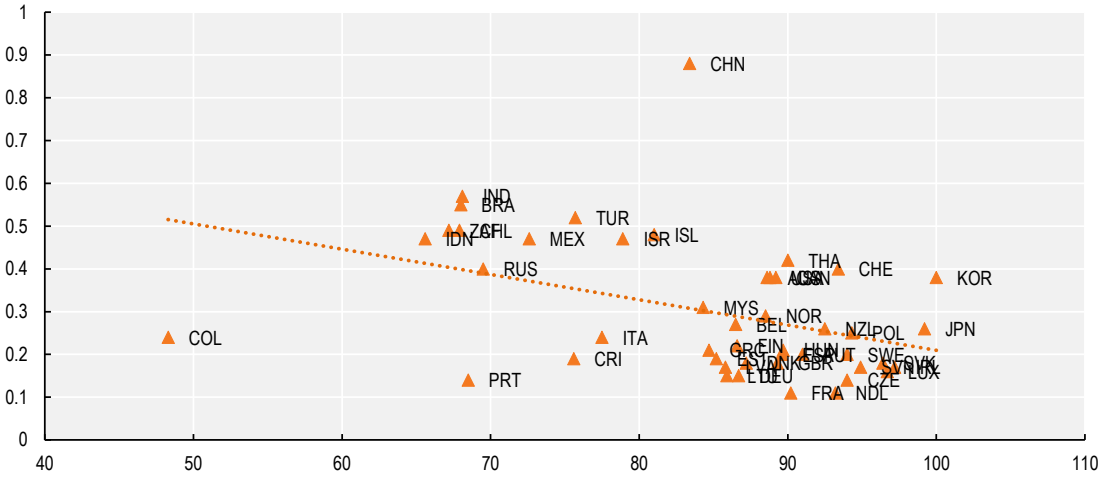
Postal and courier services are a key element of the parcel trade environment. Indeed, the rise in online retail has been accompanied by a rise in demand for parcel delivery. This is satisfied by postal or express delivery. However, the regulatory environment for courier services in Brazil remains highly restrictive. After China and India, Brazil has the most restrictive environment for such services (Figure 4.8, Panel a). This matters because restrictiveness is associated with less reliable service provision (Figure 4.8, Panel b) and less parcel trade. In particular, restrictions on foreign entry, barriers to competition and regulatory transparency, can be an issue in Brazil.

## Figure 4.8. Postal and courier services remain highly restrictive in Brazil affecting reliability

a. STRI score for postal and courier services, 2014 and 2019




b. STRI score for postal and courier services and Postal Reliability Index from UPU




Note: In Panel b: the vertical axis identifies the country's STRI for Courier Services (ranging from 0 to 1, in an increasing scale of restrictiveness). The horizontal axis shows the Postal Reliability Index from UPU identifying reach, relevance, resilience and reliability of deliveries (ranging from 0 and 100, a higher number implies greater reliability).
Source: Own calculations based on OECD STRI and OECD (2020[2]).

### *Getting goods across the border – upgrading the trade facilitation environment*

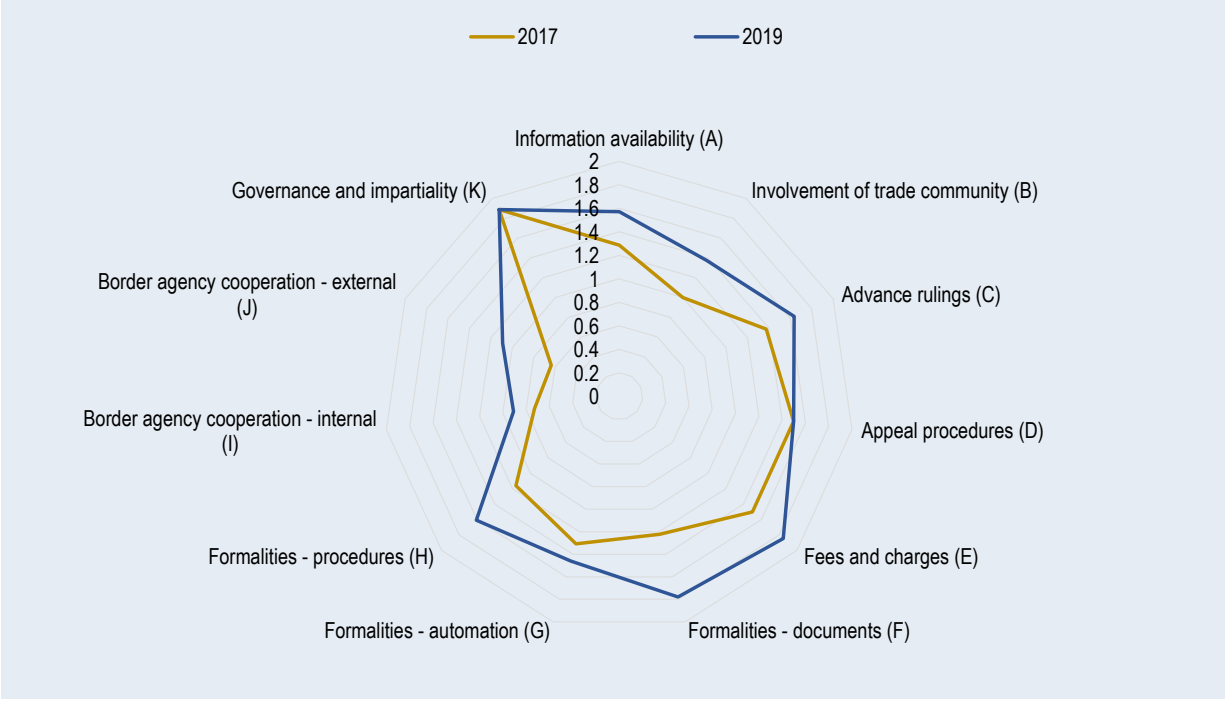
Procedures at the border also play an important role in the parcel trade ecosystem, and more broadly in the context of digitally ordered goods. The ease and speed with which digitally ordered goods can move across borders is key to ensuring affordable access to goods and enabling exports, especially for smaller firms (López González and Sorescu, 2019[10]) and particularly for trade in parcels (López González and Sorescu, 2021[9]). With more goods to clear and inspect at customs due to growing trade in digitally ordered parcels, workloads are growing and monitoring and enforcing standards as well as risk management systems may be more difficult to implement, especially in the context of COVID-19 where additional challenges related to physical distancing are also at play. A better trade facilitation environment can help countries deal with these new challenges and reduce trade costs.

In this respect, Brazil has been focusing on the use of technologies for trade facilitation through the new Single Window programme (siscomex.gov.br). Where parcels are concerned, Brazilian Customs has recently updated its electronic guide for international express deliveries, including provisions on goods used on the prevention and treatment of COVID19.[27] Brazil is also working to advance in new systems integration and data sharing solutions based on the concept of Integrated Services for MSMEs in International Trade (ISMIT). In this sense, the Brazilian government is making efforts towards the implementation of a digital platform on trade related services in partnership with the British government under the Trade Facilitation Programme.

On 29 March 2016, Brazil ratified the WTO Trade Facilitation Agreement (TFA), and since then Brazil has made good progress implementing the TFA as measured by the OECD Trade Facilitation Indicators (Box 4.2). This is especially the case in terms of external border agency co-operation, and formalities including in terms of simplification of documentary requirements and streamlining of border procedures. Brazil also continues to improve in the area of automation. The new Single Window is now fully operational for export processes and in phase of gradual implementation for import processes,[28] and the system can automatically process customs declarations, including those submitted in machine readable formats. In addition, the introduction of machine learning technologies for risk management allows for the automatic release of a high share of consignments shortly after the submission of customs declarations. However, more needs to be done to continue improving internal and external border agency cooperation, which remain, in relative terms, low (Figure 4.9).

## Figure 4.9. Brazil has made good progress on trade facilitation

OECD Trade Facilitation Indicators (2017-2019)



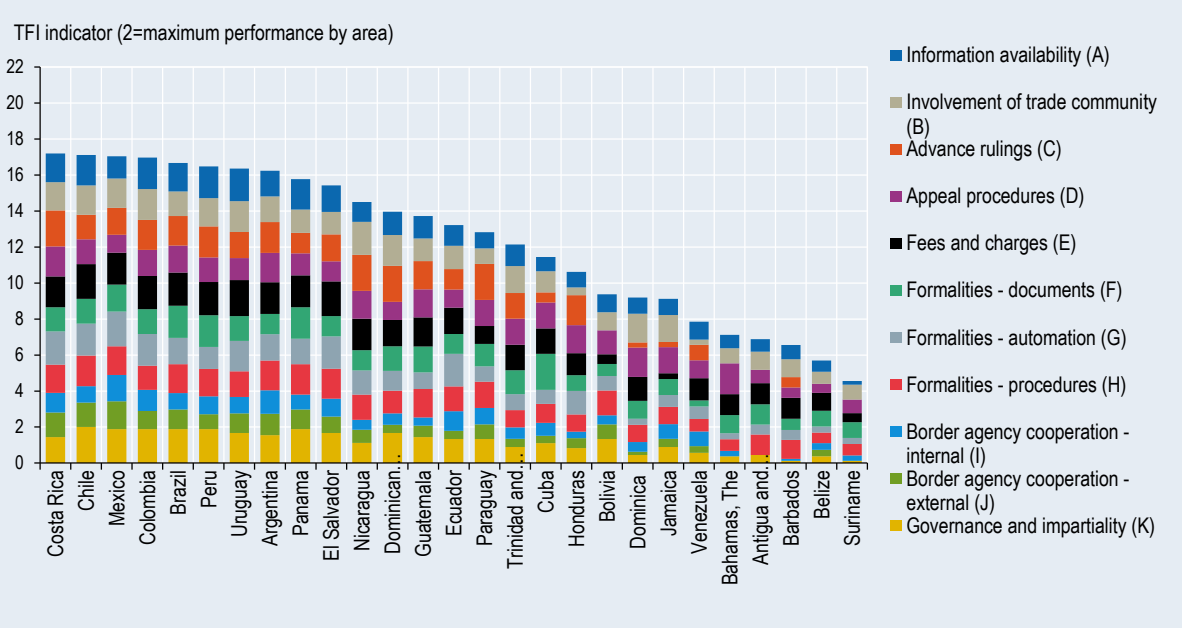

Note: The Trade Facilitation Indicators are updated every two years, 2019 is the latest available year; process to update to 2021 is ongoing.
Source: Own calculations from OECD Trade Facilitation Indicators.

Brazil continues to be one of the top performers in terms of trade facilitation in Latin America together with countries such as Costa Rica, Chile, Mexico, and Colombia (Figure 4.10. Brazil is a top performer in trade facilitation in the LAC region).

To further improve the trade facilitation environment, Brazil has been completing the final implementation phase of the Brazilian Authorized Economic Operator (AEO) Programme.[29] It grants certification to companies whose management processes minimize risks and that ensure compliance with tax and customs obligations.[30] The AEO programme counts 378 certified operators with a further 105 certification requests being processed.[31] However, while Brazil had targeted to cover 50% of Brazilian foreign trade transactions under this programme by 2019, the percentage of AEO operators against the total number of traders is of 20%.[32] Nevertheless, its coverage is expected to continue increasing as it has done recently.

## Figure 4.10. Brazil is a top performer in trade facilitation in the LAC region

OECD Trade Facilitation Indicators (2017-2019)




Note: The Trade Facilitation Indicators are updated every two years, 2019 is the latest available year; the process to update to 2021 is ongoing.
Source: Own calculations from OECD Trade Facilitation Indicators.

Digitally ordered goods are often delivered individually and fall below *de minimis* thresholds. These refer to "a valuation ceiling for goods, including documents and trade samples, below which no duty or tax is charged and clearance procedures, including data requirements, are minimal" (UNECE, 2012[11]). With simplified clearance procedures and tax exemptions, high *de minimis* levels can enable more parcel trade, reducing trade costs. However, it can also favour foreign producers over domestic ones, if only foreign producers are VAT exempt, and have implications for customs revenue (Latipov, McDaniel and Schropp, 2018[12]). Too low a threshold, in turn, risks longer clearance times for parcels undermining just-in-time delivery. While many countries have already put in place *de minimis* levels, Brazil only has a specific regime covering postal packages valued at USD 50 or less shipped for personal (non-commercial) purposes (WTO, 2017[8]).[33]

## Box 4.2. OECD Trade Facilitation Indicators

The 11 OECD TFIs were developed in 2012 to support governments in their efforts to improve their border procedures, reduce trade costs and reap greater benefits from international trade. They currently cover the full spectrum of administrative procedures at the border for more than 160 countries across income levels, geographical regions and development stages. The TFIs are available for 2012, 2015, 2017 and 2019.

They follow closely the structure of the WTO TFA, but the families of measures in the TFA have been re-organised, in order to take into account similarities between measures, underlying shared components, as well as areas where further distinctions were warranted. An additional indicator going beyond the scope of the TFA was added to capture elements of good governance and impartiality of border administrations.

The TFIs are composed of a set of variables seeking to reflect not only the regulatory framework in the concerned countries, but delve, to the extent possible, into the state of implementation of various trade facilitation measures. Overall, the indicators measure the actual extent to which countries have introduced and implemented trade facilitation measures in absolute terms, but also their performance relative to others, using a series of quantitative measures on key areas of the border process. The TFIs take values from 0 to 2, where 2 designates the best performance that can be achieved.

| Indicator | Key components |
|---|---|
| (a) Information availability | ▪ Publication of Customs and trade-related regulations and information, including through webpages on the Internet<br>▪ The existence and functioning of enquiry points<br>▪ Specific functions for businesses (dedicated webpages/portals, manuals etc.) |
| (b) Involvement of the Trade Community (Consultations) | ▪ Structures for consultations<br>▪ Established guidelines for consultations<br>▪ Publications of drafts<br>▪ Existence of notice-and-comment frameworks |
| (c) Advance rulings | ▪ Prior statements by the administration to requesting traders concerning the classification, origin, valuation method, etc., applied to specific goods at the time of importation<br>▪ The rules and process applied to such statements |
| (d) Appeal procedures | ▪ The possibility and modalities to appeal administrative decisions by border agencies |
| (e) Fees and charges | ▪ Disciplines on the fees and charges imposed on imports and exports<br>▪ Disciplines on penalties |
| (f) Formalities – documents | ▪ Acceptance of copies<br>▪ Simplification of trade documents<br>▪ Harmonisation in accordance with international standards |
| (g) Formalities – automation | ▪ Electronic exchange of data<br>▪ Use of automated risk management<br>▪ Automated border procedures |
| (h) Formalities – procedures | ▪ Streamlining of border controls (inspections, clearance)<br>▪ Separation of release for clearance<br>▪ Single submission points for all required documentation (single windows)<br>▪ Post-clearance audits<br>▪ The existence and functioning of Authorised Operators (AOs) programmes |
| (i) Internal co-operation | ▪ Control delegation to Customs authorities<br>▪ Co-operation between various border agencies of the country |
| (j) External co-operation | ▪ Co-operation with neighbouring and third countries |
| (k) Governance and impartiality | ▪ Transparency of customs structures and functions<br>▪ Accountability and ethics policy |

Source: OECD Trade Facilitation Indicators.

This contrasts with recent trends set by other countries in the region, such as Mexico and Peru, which have already set *de minimis* thresholds without broad exceptions (Table 4.2). Brazil might want to consider increasing the level and scope of its *de minimis* regime, making it applicable beyond postal shipments and also covering Business to Consumers (B2C) shipments. This might help reduce trade cost for importation and diminish delays and paperwork at the border. In 2019, it still took close to 24 hours on average in Brazil to clear products at customs while it took less than eight hours on average in Peru respectively.[34] While good progress has been made implementing pre-arrival processing and setting up a Single Window, continued support to implementing this and further automating trade processes will help Brazil close existing gaps with neighbouring countries' customs clearance time.

### Table 4.2. Some of countries in the region set higher *de minimis* thresholds than Brazil does

| Country | *De minimis* value (USD) | Remarks |
|---|---|---|
| **Brazil** | 50 | Only for postal shipments |
| Argentina | 50 | Twelve shipments per year and only through postal operator |
| Paraguay | 0 | *De minimis* of USD 100 removed in 2017 |
| Chile | 30 | Postal shipments only |
| Mexico | 50 | Duties and taxes. Except for products of difficult identification such as liquids, powder or pills or products with an import permit requirement |
| Colombia | 200 | Only for VAT, restricted to countries with Free Trade Agreement that include VAT waiver |
| Peru | 200 | |
| European Union | 174 | USD 174 (EUR 150) for Customs duties. EU abolished VAT de minimis of EUR 22 as of 1 July 2021 |
| United States | 800 | |

Source: Global Express Association, *Overview of de minimis value regimes open to express shipments worldwide:* https://global-express.org/assets/files/GEA%20De%20Minimis%20Country%20information_4%20November%202021.pdf (last update as of 4 November 2021).

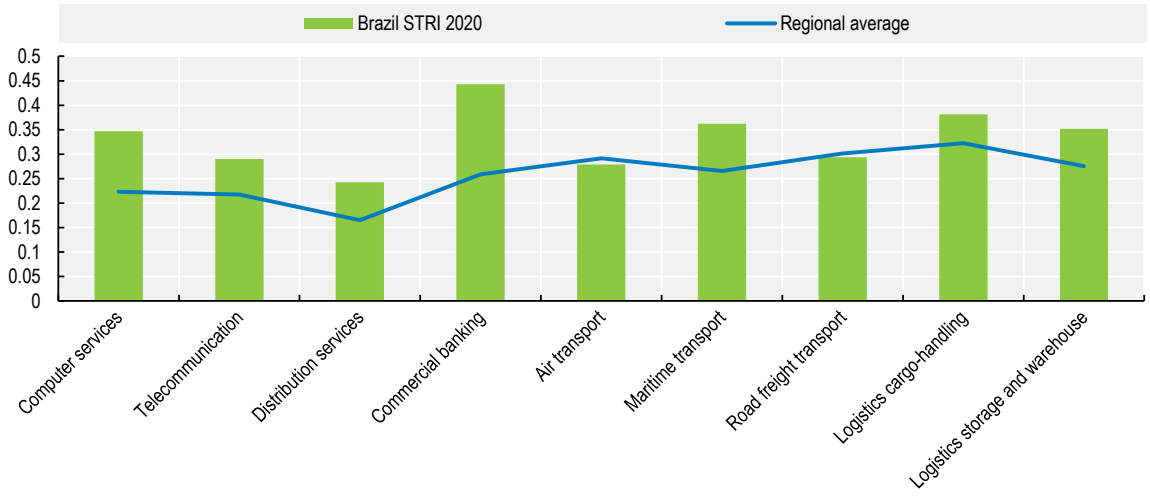
### *4.1.6. Lowering trade barriers for ancillary services is essential to complete digital transactions*

Digital transactions are supported by a range of services, such as communication and network services, computer services (e.g. software, applications, and technical assistance), financial, or distribution services (e.g. online wholesale or retail platforms). Supporting services provide essential inputs to facilitate digital trade, lower costs, and boost competitiveness. Hence, an open and enabling regulatory environment underpinning supporting services is key to promoting a dynamic digital economy (López González and Ferencz, 2018[13]).

Nonetheless, in Brazil, the level of trade restrictiveness remains higher across such sectors than the regional average (Figure 4.11). In commercial banking, where Brazil has the largest gap compared to regional and international best practice, key trade barriers include the need to obtain prior approval for the admission of foreign entities in the sector based on international agreements, reciprocity or national interest. Recent reforms have been put in place that ease the approval process through the Central Bank of Brazil for new branches of foreign financial institutions.[35] Moreover, the establishment of foreign bank branches and the provision of banking services on a cross-border basis are not allowed (OECD, 2019[14]).

## Figure 4.11. Open regulations across enabling services in Brazil can help to maximise the benefits of digital trade

Regulatory barriers across enabling services sectors in Brazil based on the OECD STRI, 2020




Note: The STRI takes values between zero and one, one being the most restrictive. Scale adjusted to 0.5. The regional average is based on the OECD STRI sectoral indices of Chile, Colombia, Costa Rica, Peru, and Mexico in 2020.
Source: OECD STRI regulatory database, 2020.

Digital orders often translate into physical delivery of goods and services where the quality, timeliness, and cost of transportation and logistics services are incremental to the competitiveness of firms selling through digital platforms. Regulation and trade policy can play a major role in reducing the market entry barriers for transport and logistics providers, enabling more efficient customs procedures at borders.

In the case of Brazil, trade barriers affect particularly logistics services (cargo handling and storage services) and maritime transport services. In logistics services, barriers related to market entry for foreign firms, state ownership in major service providers across airports, ports and rail facilities, as well as lengthy procedures at customs are among the key impediments. In maritime transport services, sectoral barriers include, among others, limitations for foreigners to carry out cabotage operations as well as barriers related to vessel registration by foreigners.[36]

Conversely, the regulatory environment is less restrictive in road freight and air transport services. In the latter sector, Brazil has been actively introducing reform measures over the past years and it is the only sector where Brazil's STRI is well below the OECD average (Box 4.3).

In sectors supporting digital trade more directly, including computer services or distribution services, Brazil's regulatory environment is more open albeit its STRIs remain slightly above both regional and OECD averages. This is mostly due to impediments on economy-wide measures, including barriers related to foreign entry, restrictions on the movement of people, and discriminatory preferences for local inputs in public tenders. Lowering these barriers are essential to increase competition, and create incentives for firms to lower prices and provide higher quality services to consumers and downstream businesses.

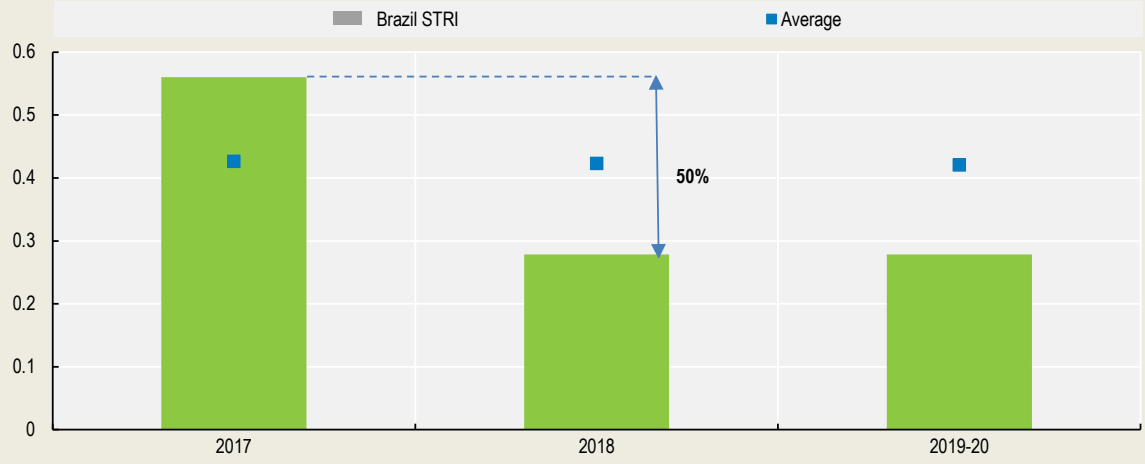
### Box 4.3. Recent reforms in Brazil's air transport sector

On 13 December 2018, Brazil implemented significant reforms on foreign investment in local airlines through Presidential Measure (PM) No. 863/2018. Congress converted the PM into Federal Law No. 13,842/2019 on 17 June 2019, embedding the reforms into the Brazilian Aeronautics Code (Federal Law N°7,565/1986). Key reforms included the removal of a 20% cap on foreign participation in Brazilian airlines, allowing foreigners full ownership of the share capital. Limitations were lifted on foreign control and management of Brazilian airlines, together with restrictions on the issuance and transfer of shares to foreigners.

These reforms resulted in Brazil's STRI scores in air transport to drop by 50% in 2018, well below the STRI average across countries. In 2019 and 2020, Brazil had the third lowest STRI in this area after Chile and Colombia.

### Figure 4.12. Reforms in the air transport sector of Brazil

Changes in the air transport STRIs for Brazil between 2017 and 2020, STRI values




Source: STRI database, 2020.

### *4.1.7. Trade and competition in Brazil's digital economy*

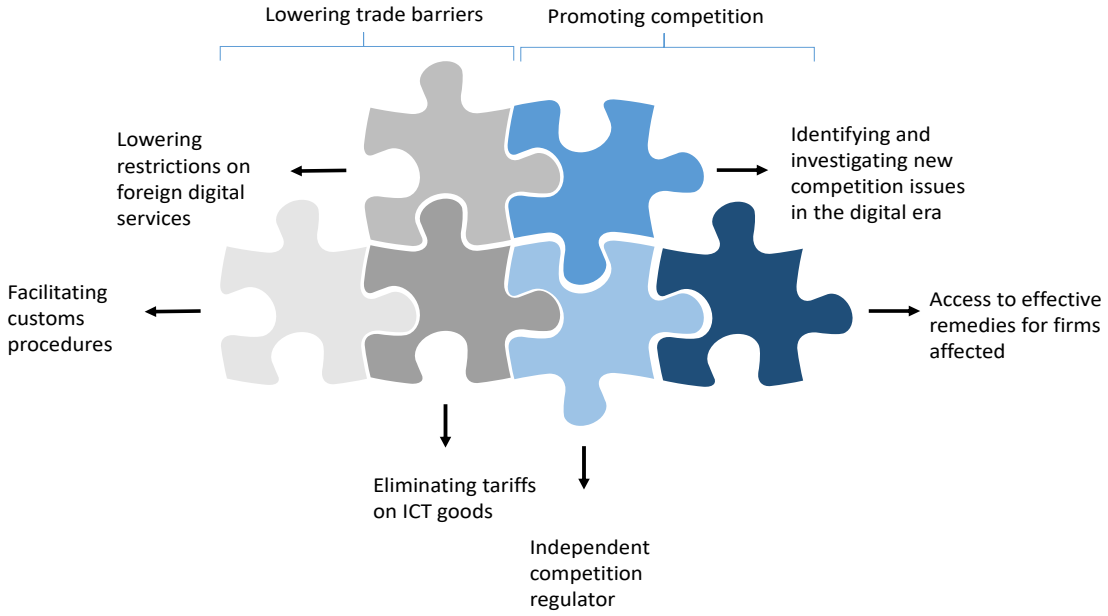
The digital transformation has significant implications on market competition, changing firms' business models, production processes, and market access conditions. On the one hand, digitalisation stimulates competition as market entry barriers become easier to overcome, particularly for smaller players such as SMEs, and the costs of scaling production, advertising and distribution become lower. Moreover, digitalisation can also foster more rapid growth often without the need to increase firm size and tangible assets (OECD, 2018[15]). On the other hand, digitalisation also raises new concerns about maintaining competitive conditions. For one, developing digital products typically requires significant upfront costs but near-zero marginal costs, leading to substantial economies of scale that can incentivise market concentration and higher mark-ups. Intangible assets (e.g. IP, software, and data) are therefore becoming more important for firms to remain competitive in a digital era, resulting in advantages to firms that have better means to collect data and more resources to protect and enforce IP (OECD, 2016[16]). Lastly, digitalisation also reinforces network effects particularly for digital platforms whose services become more valuable as their user base grows, leading to new sources of concentration.

As a result, competition policy is more intertwined with trade policy than ever (Figure 4.13). Driven by the shared objective to enhance welfare through more efficient allocation of resources, lowering trade barriers goes hand in hand with promoting effective competition policies. In the digital era, this complementarity is even more pronounced as efficient trade and competition policies will affect an increasingly global rather than local marketplace.

Moreover, gains from ambitious trade liberalisation can be thwarted by insufficient or ineffective domestic competition policies that turn a blind eye on firms exploiting their market positions at the expense of innovation and customer welfare. Efficient competition regimes can support trade policies by providing access to remedies against anti-competitive practices such as market distorting agreements between competitors, abuses of dominant positions, or harmful vertical agreements between suppliers and distributors. Digitalisation has shed new light on the importance of competition in support of trade policies, especially as digital firms operate more easily across borders, market definitions are increasingly re-defined by a borderless Internet, and unlawful practices become more difficult to detect.

### Figure 4.13. Empowering a global digital marketplace through trade and competition

Examples of measures at the intersection between trade and competition policy to enable digital transformation




Source: Authors' elaboration.

Brazil's regulatory framework on competition has undergone important changes in the past decade after the introduction of a new Competition Law in 2011 (Law N°12.529/2011). This new instrument brought important changes for Brazil's competition law and policy, including the creation of an autonomous competition agency and improving antitrust enforcement mechanisms. The reforms also contributed to better streamlining competition law in Brazil in accordance with international best practices (OECD, 2019[17]).

The competition agency, the Administrative Council for Economic Defense (*Conselho Administrativo de Defesa Econômica* – CADE), is structured in three bodies: (1) the General Superintendence (GS); (2) the Administrative Tribunal for Economic Defense; and (3) the Department of Economic Studies. The GS is responsible for initiating and conducting investigations, while the Administrative Tribunal adjudicates the

cases investigated by the GS. The Department of Economic Studies is responsible for advising the GS and the Administrative Tribunal and developing studies to ensure CADE's technical and scientific update.

Over the past years, CADE has investigated a number of antitrust cases related to market behaviour by firms participating in digital trade in Brazil (Table 4.3). Some of these cases highlighted the new challenges that digitalisation imposes for investigating potential antitrust violations in the digital era, such as challenges in the evidence gathering process in an increasingly data-driven and automated business environment. The cases also shed light on the increased market power that digital platforms may exercise on customers and downward business customers (e.g. through the imposition of conditions that prohibit or limit how these will engage with other competitors).

### Table 4.3. Examples of recent competition cases in Brazil that affect digital trade

| | Year | Sector | Parties | Description | Digital trade implications |
|---|---|---|---|---|---|
| 1 | 2019 | Online advertising services | Microsoft and Google | The case concerned a complaint launched by Microsoft against Google for alleged unfair clauses in the Terms of Services (ToS) for its AdWords' API (application programming interface) that prevented the interoperability of advertisements between the AdWords platform and other advertisement platforms. CADE's investigation was closed due to lack of evidence that Google's ToS blocked users from *multihoming* on other ad platforms. (Source: CADE) | Online advertisement services |
| 2 | 2019 | Online search services | E-Commerce Media Group Informação e Tecnologia Ltda (Buscapé) and Google | In 2013, CADE opened investigations into Google's alleged anticompetitive practices in the Brazilian online search market. The investigation concerned Google's use of two-sided markets related to its search engine services and price comparison services. The Administrative Tribunal, in majority vote, closed the case in 2019 based on lack of sufficient evidence of anticompetitive behaviour. (Source: CADE) | Online search and online comparison services by foreign entities |
| 3 | 2019 | Television and broadcasting | The Walt Disney Company and Twenty-First Century Fox Inc. | The merger between Twenty-First Century Fox and The Walt Disney Company, two companies operating in audio-visual content distribution and licensing of TV content, raised concerns about the level of competition in the market of cable sports channels (with respect to ESPN and Fox Sports). The Administrative Tribunal approved the acquisition on condition of structural remedies in the form of divestment (sale of Fox Sports) to maintain the same competitive level that was present before the merger. (Source: CADE Administrative Tribunal) | Distribution of foreign audio-visual content |
| 4 | 2018 | Digital platforms (online travel booking) | Expedia, Decolar, Booking, and Fórum de Operadores Hoteleiros do Brasil - FOHB | The case concerned the use by online travel booking providers (Booking.com, Decolar.com and Expedia) of price-parity clauses in contracts signed with hotel chains that use their Internet sales platforms. These clauses inhibited hotels from offering more advantageous conditions to customers through their own sales channels or competing on other companies' platforms. CADE considered this practice to limit competition among platforms and travel agencies, negatively impacts on prices and increases market entry barriers. The three companies agreed to stop using price-parity clauses through a Cease and Desist Agreement valid for three years. (Source: CADE) | Online travel booking, tourism services |
| 5 | 2017 | Television and broadcasting | Time Warner Inc. and AT&T | The acquisition of Time Warner by AT&T resulted in a vertical integration between the channel licensing service to operators provided by Time Warner Group and the pay-tv services (packing and distribution) provided by Sky Brasil – a company controlled by AT&T. A Merger Control Agreement was signed, mandating governance and accounting separation between the companies. | Distribution of foreign audio-visual content |

| | Year | Sector | Parties | Description | Digital trade implications |
|---|---|---|---|---|---|
| | | | | (Source: CADE GS) | |
| 6 | 2017 | Digital platforms (food delivery) | Rocket Internet SE (Delivery Hero) and Naspers Ventures B.V. (iFood and Spoonrocket) | The case concerned the acquisition by Naspers of shares in Delivery Hero, resulting in ownership concentration in various players in Brazil's online food delivery market. The GS cleared the transaction but noted that a strategy of acquiring companies in the market and conclusion of exclusive agreements with restaurants could become an entry barrier for new players in the future. (Source: CADE GS) | Market entry by foreign digital platform services providers |
| 7 | 2016 | Digital platforms (ride hailing) | Associação de Motoristas Autônomos de Aplicativos, Ministério Público do Estado de São Paulo and Uber Tecnologia do Brasil Ltda | CADE was asked to investigate the competition effects of Uber in the Brazilian taxi market. The case was closed due to lack of evidence on the alleged conducts and their negative impact. (Source: CADE GS) | Market entry by foreign digital platform services providers |

Source: Based on information provided in BRICS (2019[18]).

CADE also faces some challenges that are common to many competition authorities across the globe. For one, antitrust investigations often face long delays as cases become more complex to pursue creating lengthy backlog and undermining effective and speedy remedies. For most of the cases presented above, it took several years to arrive at an outcome. Moreover, while CADE has been particularly active in merger control and cartel enforcement, relatively few cases focused on abuses of dominance (OECD, 2019[17]). As digitalisation accelerates firms' ability to grow and data-driven business models reshape market dynamics, it may be warranted to further prioritise such investigations to promote long-term consumer welfare.

Further expanding the benefits of digitalisation in the Brazilian economy will depend on complementing trade liberalisation with strengthening the competition framework and enforcement. In turn, a more robust competition regime will be conducive to more digital imports and exports of goods and services benefitting Brazilian consumers on a wider scale. CADE is well positioned to play a crucial role in promoting this, and to undertake further steps to identify and address the emerging challenges that digitalisation presents to effective competition in Brazil's digital economy.

## 4.2. Digital trade provisions in Brazil's international and regional trade agreements

### *4.2.1. Brazil and the international regulatory framework for digital trade*

Brazil has been a member of the WTO since its establishment in 1995, and participates actively in its work and while there is no explicit WTO agreement dedicated to digital trade, the existing regulatory framework covers important aspects of the digital trade environment. Indeed, as foreshadowed in Chapter 1, the General Agreement on Trade in Services (GATS) establishes important rules for digitally enabled and delivered services and the General Agreement on Tariffs and Trade (GATT) and related agreements play an important role for goods that are digitally ordered (Section 1.1 of Chapter 1).

More concretely, and with respect to services relevant for digital trade, Brazil has made specific commitments on basic telecommunications services (GATS/SC/13/Suppl.2), financial services (GATS/SC/13/Suppl.3/Rev.1), distribution services and courier services. However, there are some sectors where Brazil has no sectoral commitments (although horizontal commitments apply), such as computer services, which may affect clarity on the applicable trade rules for key digitally enabled services. Computer

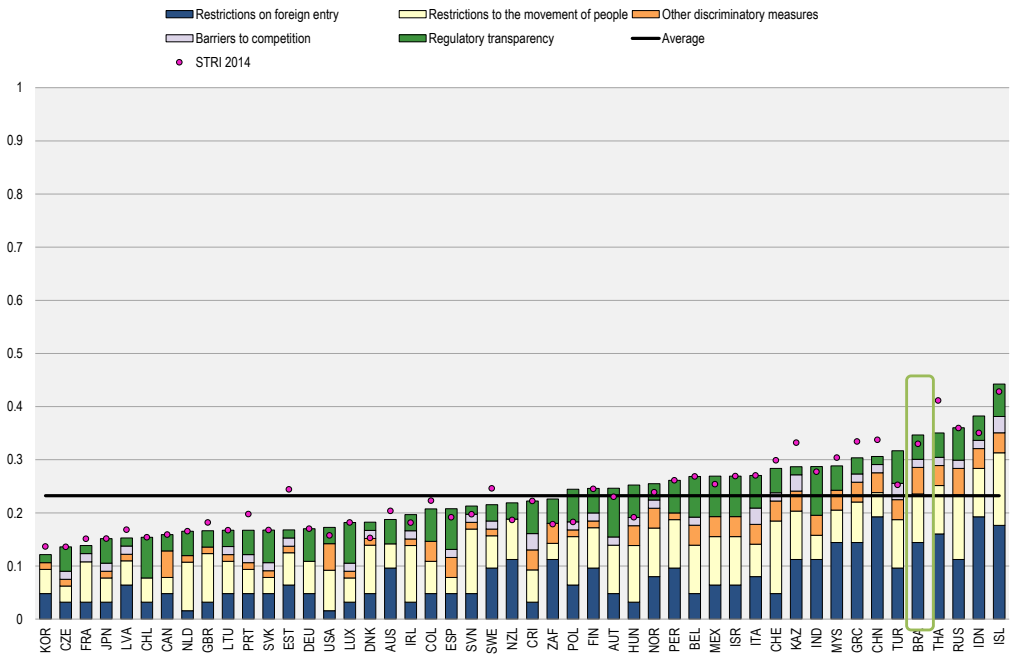
services is generally characterised by high levels of commitments both in the GATS and in regional trade agreements, including among countries in the Latin America region (e.g. see Argentina (GATS/SC/4), Uruguay (GATS/SC/91) or Venezuela (GATS/SC/92)).

The importance of computer services has grown significantly in the past two decades, driving the development of the knowledge-based and data-driven economy. It covers a broad range of activities, from installation of computer hardware to software implementation and data processing services. As such, it plays an essential role in building the digital infrastructure needed to empower the digital transformation across other sectors (e.g. enabling the digital delivery of other goods and services). In Brazil, in 2018, computer services exports accounted for about USD 1.97 billion while imports were worth USD 3.8 billion attesting to the importance of the sector.

However, the applied regime for computer services is relatively restrictive when compared to OECD countries and regional trade partners such as Chile, Colombia or Costa Rica (Figure 4.14). Recent empirical work demonstrates that having legally binding services commitments in the GATS and regional trade agreements closely aligned with the applied regime have a positive impact on trade (Lamprecht and Miroudot, 2018[19]). Moreover, binding full commitments (i.e. completely lifting trade barriers in the sector) offers the highest level of certainty for suppliers as it prevents the introduction of new trade barriers, and further boost trade activities.

## Figure 4.14. The level of restrictiveness on the applied regulatory regime for computer services is relatively high in Brazil

OECD STRI for Computer Services, 2020




Note: The STRI indices take values between zero and one, one being the most restrictive.
Source: OECD STRI database, 2020.

Brazil participates in a number of international instruments that currently affect rules related to digital trade (Table 4.4). Brazil is a party to most WTO Agreements (except the ITA) but it is not party to some of the WIPO-administered treaties and the UN Convention on the Use of Electronic Communications in International Contract. Also, some key instruments such as the Protocol Relating to the Madrid Agreement

Concerning the International Registration of Marks and the inclusion of additional commitments in financial services into Brazil's GATS schedule were only achieved recently. Further participation in international agreements relevant for digital trade is important to promote legal certainty and reduce regulatory frictions for businesses to engage in cross-border digital trade.

Brazil has also adopted a pro-active approach at the WTO Joint Statement Initiative negotiations on e-commerce. So far, Brazil has proposed to include rules on many issues, such as e-contract, e-authentication, unsolicited commercial communications, permanent extension of the moratorium (custom duties), paperless trading, cross-border data flows and privacy protection (INF/ECOM/27/Rev.1). Brazil has also proposed rules on more advanced issues, such as single window's data exchange and system interoperability and use of technology for the release and clearance of goods (INF/ECOM/27/Rev.1/Add.1).

### Table 4.4. Brazil's participation in key international instruments relevant for digital trade

Examples of relevant instruments and their status *vis-à-vis* Brazil

| Instrument | Status |
|---|---|
| WTO General Agreement on Tariffs and Trade (GATT) | Applies since 30 July 1948 |
| WTO General Agreement on Trade in Services (GATS) | Applies since 1 January 1995 |
| WTO GATS Annex on Telecommunications | Applies since 15 February 1998 |
| WTO Understanding on Commitments in Financial Services | Applies since 18 March 2016 |
| WTO Information Technology Agreement (ITA) | Not a party |
| WTO Trade Facilitation Agreement (TFA) | Applies since 29 March 2016 |
| WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) | Applies since December 1994 |
| WIPO Copyright Treaty | Not a party |
| WIPO Performances and Phonograms Treaty | Not a party |
| Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks | Applies since 2 October 2019 |
| UN Convention on the Use of Electronic Communications in International Contract | Not a party |

Source: Authors' elaboration.

### *4.2.2.* ***Brazil and regional trade agreements / arrangements***

#### *Brazil's regional trade agreements*

Brazil's regional trade policy is influenced in large part by its membership to the Southern Common Market (MERCOSUR) together with Argentina, Paraguay, Uruguay, and Venezuela. As part of MERCOSUR, Brazil is party to a number of preferential trade agreements with key trade partners in the region such as Chile, Bolivia, Mexico, Peru, Colombia, Ecuador, and Cuba. Outside the region, MERCOSUR has concluded agreements with, among others, India, Egypt and Israel. Also, in 2019, MERCOSUR concluded negotiations with EFTA and reached a political agreement with the European Union on a comprehensive trade agreement in the context of a wider EU-MERCOSUR Association Agreement, which includes provisions on e-commerce.[37] Both of these agreements are still undergoing legal scrubbing. Negotiations are also ongoing with other countries and regional trade blocks.

Apart from the agreement with the European Union, the MERCOSUR agreements do not cover digital trade or e-commerce provisions, and most of them do not cover services. Within MERCOSUR, however, services trade liberalisation has been advanced through the Protocol of Montevideo on Trade in Services in the MERCOSUR which was signed in December 1997, entered into force in 2005 and had to be implemented before 2015 (MERCOSUR, 1997[20]).[38] The Protocol includes specific commitments to liberalise services within the region, including with respect to services that enable digital trade such as

computer services, telecommunications, distribution and financial services. In the case of Brazil, this includes coverage of computer services with no limitations on modes 1-3 (unlike the GATS where this sector is not listed in it schedule) as well as expanded commitments in telecommunications services (*Decreto Legislativo* 1016/2005). However, some uncertainties remain with respect to the application of open commitments for modes 1 and 2 on digitally deliverable good and services.[39]

In addition, the MERCOSUR Agreement on Electronic Commerce was concluded on 29 April 2021. This Agreement represents an important step towards deepening the integration process in the region and includes provisions on: customs duties on electronic transmissions; electronic signature and authentication services; online consumer protection; protection of personal data; cross-border transfer of information by electronic means; location of computing facilities; principles on the access and use of the Internet for electronic commerce; unsolicited direct commercial communications; electronic commerce facilitation; and cooperation, among others. Mercosur's framework on electronic commerce also includes Resolution 37/2019 on the protection of consumers in electronic transactions and the Agreement on Mutual Recognition of Electronic Signatures of December 2019.

Outside of MERCOSUR, only the Brazil-Chile FTA includes an e-commerce chapter.[40] This chapter covers, among others: legal framework for electronic transactions; e-signature; online consumer protection; protection of personal data; paperless trade administration; cross-border transfer of information by electronic media; location of computer facilities; and unsolicited electronic commercial communications.[41]

The coverage of e-commerce provisions in the Brazil-Chile FTA and in MERCOSUR's Agreement on Electronic Commerce is comparable to that in the CPTPP and the USMCA. It should also be highlighted that both the Brazil-Chile FTA and MERCOSUR's Agreement on Electronic Commerce include advanced provisions on cross-border data flows and location of computer facilities, which would contribute to promoting cross-border data flows that are essential to digital trade.

Although Brazil has thus far only included e-commerce provisions in its agreements with Chile, the European Union and MERCOSUR, these three agreements include comprehensive and ambitious commitments towards liberalising digital trade and provide a good basis for including similar provisions in Brazil's future trade agreements as well as updating existing ones.

Rules on e-commerce are not the only ones that could contribute to promoting digital trade. For instance, as described in Section 4.1.1, telecommunications services play a crucial role to expand digital trade. The Telecommunications chapter in the Brazil-Chile FTA and the Service and Establishment chapter of the EU-MERCOSUR agreement, as well as similar provisions in the EFTA-MERCOSUR Agreement set out rules and principles that would be conducive to digital trade. These chapters include not only the ones already included in the WTO Reference Paper on regulatory principles for telecommunications (e.g. on anti-competitive practice, independent regulatory bodies and interconnection), but also cover new areas and emerging issues (e.g. net neutrality, treatment of important suppliers; disaggregation of network elements; co-location and flexibility in the choice of technologies (Brazil-Chile) and access to essential facilities, scarce resources, and international mobile roaming services (EU-MERCOSUR)).

The impacts of RTAs on digital trade would also depend on the extent of services liberalization achieved under those agreements, particularly in services that are ancillary to the success of digital trade such as telecommunications, distribution, financial services but also transport and logistics services.

The challenge that Brazil faces, however, is that digital trade is not covered in most of its trade agreements. Deeper regional integration and enhanced international cooperation would benefit Brazilian exporters of digital goods and services, particularly as Brazilian firms tend to export more to geographically closer partners (OECD, 2016[21]). Further digital integration of the South American market could be further undertaken through MERCOSUR and other existing regional frameworks as well as through comprehensive RTAs such as the one that Brazil has done with Chile. Ongoing trade negotiations between

MERCOSUR and several other countries including Korea, Canada, and Singapore, encompass discussions on electronic commerce providing an opportunity to strengthen coverage of digital trade provisions in trade agreements.[42] Continued proactive engagement on the international arena, as is the case in the active involvement of Brazil in the WTO Joint Statement Initiative negotiations on e-commerce, also remains important in order to promote multilateral solutions for the pressing digital trade challenges.

### *Other initiatives toward regional digital integration*

On the regional level, one of the instruments for promoting regional integration is the Digital Agenda for Latin America and the Caribbean (eLAC). At the eLAC regional conference in November 2018, participating countries approved the eLAC 2020 Digital Agenda, which includes 30 goals to seek "*regional cooperation to continue moving forward on inclusion, the digitalization of production, skills development among the population, as well the promotion of open government and governance that stimulates collaboration between countries*".[43] Among others, eLAC 2020 Digital Agenda targets to strengthen regional digital market through various goals:[44]

- *Goal 8*: Promote a regional digital market strategy to increase trade, expand the digital economy and strengthen the competitiveness of Latin America and the Caribbean, through incentives, regulatory coherence, integration of digital infrastructure, the development of digital platforms of goods, services and content, and cross-border data flows.
- *Goal 9:* Foster measures for regional trade facilitation through the use of digital technologies, institutional coordination and interoperability among different national foreign trade systems.

The Seventh Ministerial Conference on the Information Society in Latin America and the Caribbean was held on the 23-26 November 2020 in Quito, Ecuador (as a virtual meeting). The Conference aimed at strengthening cooperation on a range of digital issues and renew agreement on pursuing the Digital Agenda while tackling the challenges of COVID-19.[45] In this regard, the newly agreed eLAC 2022 Digital Agenda for Latin America and the Caribbean[46] reiterates the goal of promoting a regional digital market strategy that facilitates cross-border e-commerce and digital trade. The acknowledged mechanisms to achieve this strategy include integration of digital infrastructure, harmonization of regulation, promotion of free flow of data with trust in accordance with domestic legislation, trade facilitation, improved postal and logistics services, and implementing regulatory frameworks that encourage innovation in digital payment services.

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## Notes

[1] Lei No. 12.965 (Marco Civil da Internet) de 23 de Abril de 2014 estabelece princípios, garantias, direitos e deveres para o uso da Internet no Brasil, available at http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2014/lei/l12965.htm (last accessed on 1 September 2020).

[2] The Digital STRI is a rich basis to assess the extent to which regulatory regimes in different countries diverge from one another. Regulatory heterogeneity using the STRI methodology can be assessed by comparing divergences measure by measure in country pairs (Nordås, 2016[22]). For each measure the country pair has a score of zero if both countries have the same answer (similar regulation) and one if they have different answers (diverging regulation). The scores are then aggregated using the STRI methodology in order to develop regulatory heterogeneity indices for each country pair. The regulatory heterogeneity indices are useful for monitoring regulatory convergence, particularly in cases where trade agreements include regulatory cooperation (Nordås, 2016[22]).

[3] See also Figure 10 in Casalini, López González and Nemoto (2021[6]) which compares privacy principles across countries showing a near full overlap between GDPR and the Brazilian General Data Protection Law.

[4] Article 3 of law nº 13,709/2018 (LGPD).

[5] Recommendation of the Council concerning Guidelines governing the Protection of Privacy and Transborder Flows of Personal Data (2013), C(80)58, as amended on 11 July 2013 by C(2013)79.

[6] Article 55-D, Law Nº 13,709/2018 (LGPD) and Article 4 of Decree Nº10,474, 26 August 2020.

[7] Decree Nº 10,474 of 26 August 2020.

[8] Article 58-A, Law Nº 13,709/2018 (LGPD).

[9] Portaria Nº15 of 21 July 2021.

[10] For instance, Article 4(IV), provides that the LGPD shall not apply to the processing of personal data originating from outside the Brazilian territory and which are not subject to communication, shared use of data with Brazilian processing agents or subject to international transfer of data with other country than the country of origin, provided the country of origin provides a degree of personal data protection consistent with the provisions of the LGPD.

[11] To date, Argentina has recognised Uruguay, members of the European Union and of the European Economic Area, the United Kingdom, Swiss Confederation, Guernsey, Jersey, Isle of Man, Faroe Islands, Canada only in respect of their private sector, Andorra, New Zealand and Israel (Disposición 60 – E/2016, 16 November 2016 and Resolucion 34/2019, 22 February 2019). Uruguay has recognised Argentina, members of the European Union and of the European Economic Area, the United Kingdom, Switzerland, Guernsey, Jersey, Isle of Man, Faroe Islands, Canada only in respect of their private sector, Andorra, New Zealand, Israel, and transfers to the United States within the Privacy Shield framework (Resolucion 4/2019, Acta 3/2019, 12 March 2019).

[12] For instance, the European Union has communicated its plan to launch discussions with Brazil under the adequacy mechanism of the EU GDPR (https://ec.europa.eu/commission/sites/beta-political/files/communication_from_the_commission_to_the_european_parliament_and_the_council.pdf).

[13] Portaria Nº11 of 27 January 2021.

[14] Available at: https://www.in.gov.br/en/web/dou/-/resolucao-cmn-n-4.893-de-26-de-fevereiro-de-2021-305689973. The same requirement was previously foreseen in Article 16 of Resolution Nº 4.658 of the Brazilian Central Bank which was revoked.

[15] Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Chapter 14, Article 14.13.

[16] Article 10.13 Brazil-Chile FTA.

[17] Banco Central do Brasil, Communication Nº 33,455 of 24 April 2019 "discloses the fundamental requirements for the implementation of open banking in Brazil".

[18] Banco Central do Brasil, Joint Resolution Nº3 of 24 June 2020.

[19] Banco Central do Brasil Communication nº 32927 of 21 December 2018, point 2.

[20] *Lei nº 9.279, Regula direitos e obrigações relativos à propriedade industrial*, 14 May 1996.

[21] *Lei nº 9.610, Altera, atualiza e consolida a legislação sobre direitos autorais e dá outras providências*, 19 February 1998.

[22] *Lei nº 9.609 Dispõe sobre a proteção da propriedade intelectual de programa de computador, sua comercialização no País, e dá outras providências*, 19 February 1998.

[23] See https://www.wipo.int/treaties/en/ip/wct/. Brazil is a party to 14 of the 26 treaties administered by the World Intellectual Property Organization (WIPO).

[24] WIPO IP Statistics Data Center, last updated April 2020, https://www3.wipo.int/ipstats/index.htm?tab=patent.

[25] *Relatório de Atividades 2019, Instituto Nacional da Propriedade Industrial*.

[26] WIPO webpage https://www.wipo.int/pct/en/filing/pct_pph.html.

[27] See https://www.gov.br/receitafederal/pt-br/assuntos/aduana-e-comercio-exterior/manuais/remessas-postal-e-expressa.

[28] See Brazilian National Single Window Project (October 2021), http://siscomex.gov.br/wp-content/uploads/2021/10/BRAZILIAN-SINGLE-WINDOW.pdf.

[29] Trade facilitation measures for Authorized Operators are required under the TFA Art. 7.7.

[30] The certified companies gain a broad list of benefits such as reduced release times, lower rates of Customs examinations, the possibility to submit pre-arrival declarations and to request immediate release of cargo, and a direct communication channel with Customs to solve issues or pose questions. It is said that, compared to regular operations, release time for AEO is 65% below the average release time at export and 81% below at import in Brazil, while the number of inspection for AEO is 77.5% lower at export and 74.5% lower at import. https://mag.wcoomd.org/magazine/wco-news-88/brazil_aeo/.

[31] As of August 2021, https://www.gov.br/receitafederal/pt-br/assuntos/aduana-e-comercio-exterior/importacao-e-exportacao/oea

[32] TFIs, H111.

[33] According to WTO (2017[8]):"Virtually all international e-purchases are subject to a 60% flat/single equalization tax on the purchase price covering/compensating customs duty and other internal taxes/charges on imports. Certain medicines (upon submission of specific documentation) and printed books or periodicals are the only exceptions to these tax requirements. An exemption (excluding the ICMS tax) for packages valued at USD 50 or less applies only to remittances issued by an person to another person for personal use or gifts of lower value but not for commercial operations. A Simplified Taxation Regime applies to goods not exceeding USD 3 000."

[34] OECD Compare your Country 2019.

[35] See among others, Presidential Decree 10,029, 2019 authorising the Central Bank of Brazil to recognize the establishment of new branches as being in the interest of the Government, as well as Circular 3.977 recognizing the foreign participation in the capital of financial institutions domiciled in Brazil as also being in the interest of the Government.

[36] Note that in May 2021, Brazil decided not to renew its agreement on maritime transport with Argentina, Chile and Uruguay which provided for preferential conditions to the ships under the flag of one of the signatory countries.

[37] The draft Service and Establishment chapter of the EU-MERCOSUR trade agreement, which may be amended before being signed by the parties, includes, among others, references to customs duties on electronic transmissions; principle of no prior authorisation; conclusion of contracts by electronic means; electronic signature and authentication services; unsolicited direct marketing communications; and consumer protection.

[38] Paraguay's ratification of the Protocol is still pending. See http://www.sice.oas.org/Trade/MRCSR/montevideo/pmontevideo_s.asp.

[39] Updates to Brazil's list of specific commitments under the Protocol provide the following: "*A regulamentação sobre o comércio de produtos comercializados eletronicamente ("electronically deliverable products") e os serviços prestados via comércio eletrônico está sob análise do Congresso Nacional. As inscrições nas colunas de acesso a mercados e tratamento nacional em Modos 1 e 2 deverão ser lidas em conjunto com eventuais restrições para a prestação ou comercialização de tais serviços por meio eletrônico. Portanto, a inscrição "Nenhuma" nas colunas de acesso e mercados e tratamento nacional, nos modos 1) e 2) não implica a inexistência de restrições ao comércio de serviços pelo meio eletrônico.*" See Decreto Legislativo 984/2009, available at : https://www2.camara.leg.br/legin/fed/decleg/2009/decretolegislativo-984-22-dezembro-2009-599041-publicacaooriginal-121435-pl.html.

[40] The Brazil-Chile FTA was ratified in October 2021.

[41] See http://www.sice.oas.org/TPD/BRA_CHL/FTA_CHL_BRA_s.pdf.

[42] For further details, see http://www.sice.oas.org/tpd_e.asp.

[43] See https://conferenciaelac.cepal.org/6/en/news/countries-latin-america-and-caribbean-commit-spearheading-digital-ecosystem-e-commerce-access.html.

[44] See https://conferenciaelac.cepal.org/6/sites/elac2020/files/cmsi.6_digital_agenda-en-23_april.pdf.

[45] For more details on eLAC 2020, see https://conferenciaelac.cepal.org/7/en.

[46] For more detail on eLAC 2020, see https://conferenciaelac.cepal.org/7/en/documents/digital-agenda-elac2022.

# 5 Enabling Brazilian firms to export in the digital era

This chapter uses detailed firm-level data to investigate different aspects of the digital transformation for Brazilian firms. The analysis shows that imported digital inputs contribute to the export competitiveness of Brazilian goods exporters. These are especially important for micro-sized firms. It also highlights that the digital services trade restrictions faced by Brazilian exporters significantly affect their capacity of export digitally deliverable and non-digitally deliverable services, especially in the case of smaller exporters.

## Key messages

- Although only 0.46% of firms in Brazil were engaged in international trade, those that do command a disproportionate share of economic activity (8.9% of total employment).
- Out of those that engage in trade, most, 67% do so through a single trade channel, whether import or export of goods and/or services. The remaining 33% of firms, employing 59% of workers engaged in trade are simultaneous traders.
- Large firms represent only 7% of all trading firms but they employ most workers (72%) and represent the highest share of exports (59%), they also tend to be simultaneous traders. By contrast, micro firms represent the largest share of firms (52%) but the smallest share of workers (2%) and an intermediate share of exports (17%). They also tend to be single traders.
- Enabling Brazilian exports in the digital era requires facilitating access to ICT inputs and reducing barriers to digitally enabled trade in partner countries, this is especially important to enable smaller firms to benefit from trade in the digital era.

Export growth can be a driver of economic growth (Brenton and Newfarmer, 2007[1]), which is why understanding export competitiveness is key to informing policy action to enable benefits from digitalisation. Ultimately, it is firms that export, which is why it is important that analysis on export competitiveness be undertaken at the firm level.

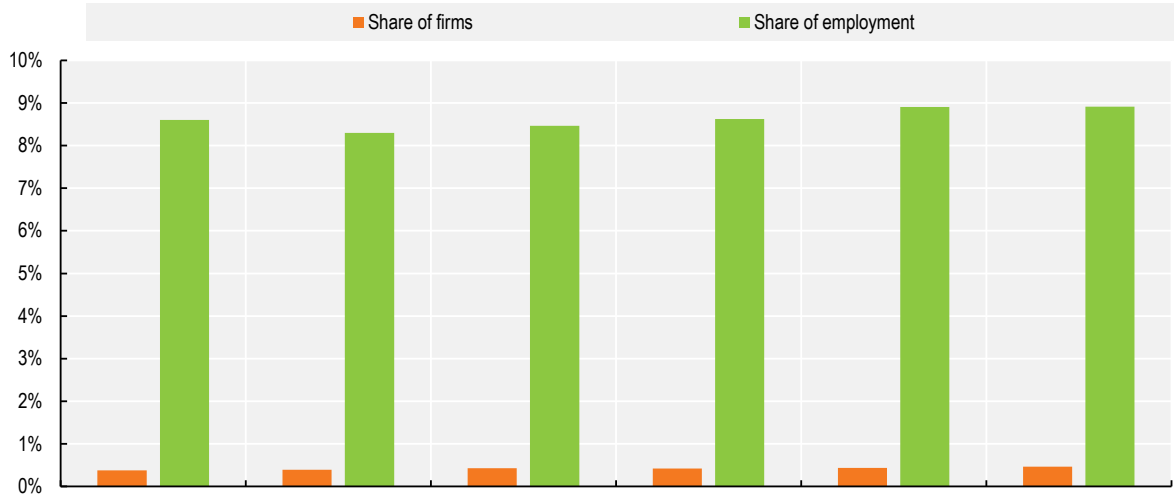
This chapter uses micro-data to shed light on different aspects of the digital transformation of Brazilian trading firms. The next section provides an overview of the characteristics of Brazilian traders. Section two follows with an analysis of the role of imported ICT inputs in enabling export competitiveness. Section three reviews how digital services restrictions affect the ability of Brazilian firms to export digitally deliverable services. The final section concludes with some observations and policy recommendations.

## 5.1. What are the characteristics of Brazilian exporters?

### *5.1.1. Profile of Brazilian trading firms*

As is the case across most countries, trading is relatively rare among firms in Brazil. In 2019, only 0.46% of firms were engaged in international trade (whether importing or exporting goods or services). However, these firms accounted for 9% of total employment, underscoring that trading firms command an important share of economic activity (Figure 5.1).

## Figure 5.1. Very few firms engage in trade but they employ a disproportionate amount of workers




Source: Own calculations based on data from SECEX, SISCOSERV and RAIS.

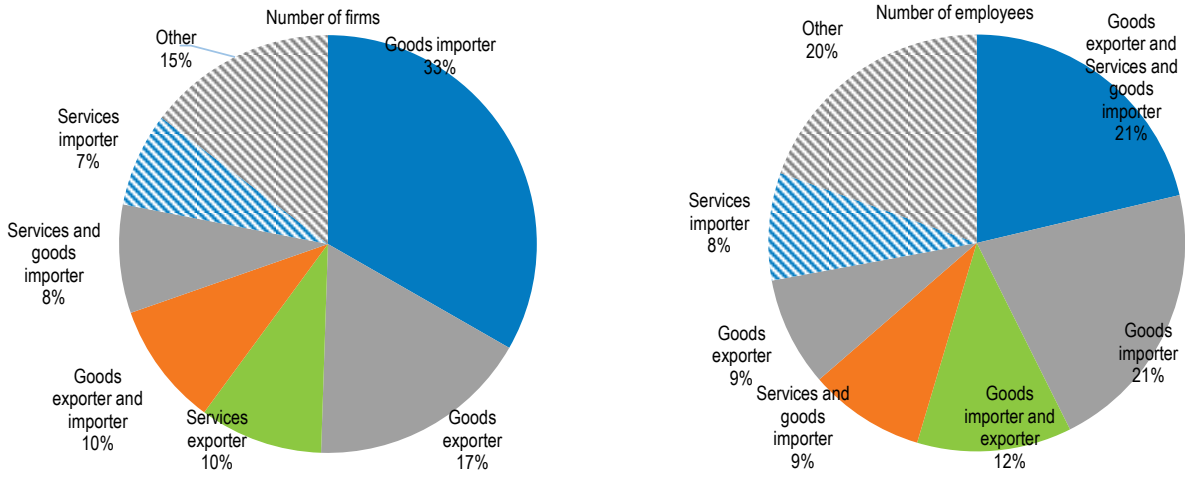
The largest share of trading firms is in *wholesale and retail* representing 34% of Brazilian trading firms and 20% of employment in trade. This sector is also one of the most engaged in international trade representing 29% of goods imports, 19% of goods exports and 11% and 8% of services imports and exports.[1] The *other business services* sector also represents a considerable share of both trading firms (14%) and employment in trade (12%) and is widely engaged in services trade as importer (11% of services imports) and exporter (16% of services exports).

In terms of trade values:

- Firms in the *coke and refined petroleum* sector were the largest services importers (32% of total services imports)
- Firms in *financial and insurance activities* were the largest services exporters (30% of total services exports)
- Firms in the *wholesale and retail trade; repair of motor vehicles* sector were the largest goods importers (28% and 29% of total goods imports respectively)
- Firms in *extractive industries* and *wholesale and retail trade* were the largest goods exporters (19% of total goods exports each).

Most Brazilian firms that engage in trade do so only as importers of goods (33.3%) while 17.2% of trading firms engage only as goods exporters, respectively employing 21% and 9% of the workforce engaged in trade (Figure 5.2). Most trading firms, 67%, only engage in one, single, type of trade channel, whether import or export of goods or services.[2] However, simultaneous traders, which are firms engaging in more than one channel of trade (whether as exporters of goods and exporters of services or importers of goods and importers or services or combinations thereof), although representing a lower share of traders (33%), they occupy a high share of employment (59%) and an even higher share of exports (75%).[3]

## Figure 5.2. Most firms either import or export, very few do both across goods and services




Note: The left panel shows the share of firms according to different categories of traders. The right panel does the same but using employment data. Each category is mutually exclusive so that, those in the "Export Goods" category are firms that only export goods. Firms that export goods but also import goods appear in the "Imports and Exports of Goods" category. The "Other" category represents permutations of goods and/or services imports and/or exports, not represented in the figure.
Source: Own calculations based on data from SECEX, SISCOSERV and RAIS.

Focusing on simultaneous traders (Table 5.1), the most common activity of firms is the simultaneous import and export of goods, although this is closely followed by imports of goods and services. Over 31% of the value of Brazilian exports involves firms that import goods and services and export goods, category which also occupies the largest share of employment (21.3%).

## Table 5.1. Simultaneous traders tend to be exporters of goods

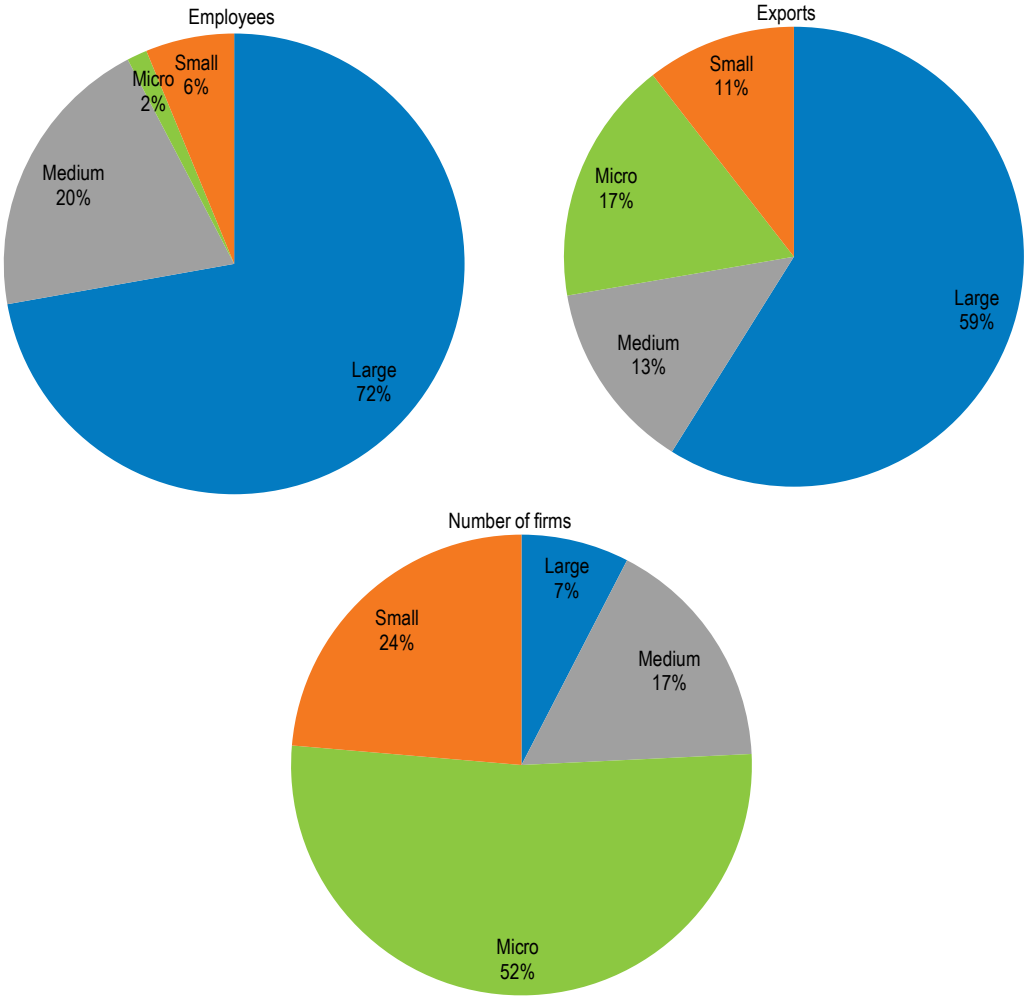
| | Firms | | Employees | | Value of trade | |
|---|---|---|---|---|---|---|
| | 2014 | 2019 | 2014 | 2019 | 2014 | 2019 |
| Single traders | 70.0% | 67.4% | 43.3% | 40.9% | 21.5% | 24.5% |
| Importer and exporter of goods | 10.2% | 9.6% | 14.9% | 12.0% | 17.6% | 16.7% |
| Importer of goods and services | 6.7% | 8.4% | 8.3% | 9.0% | 0.0% | 0.0% |
| Importer of goods and services and exporter of goods | 4.6% | 6.8% | 15.4% | 21.3% | 29.1% | 31.1% |
| Importer and exporter of services | 3.4% | 3.1% | 3.8% | 4.2% | 3.9% | 7.8% |
| Importer and exporter of goods and services | 2.1% | 1.6% | 9.3% | 6.0% | 17.3% | 12.0% |
| Importer of services and exporter of goods | 0.7% | 1.2% | 1.2% | 2.7% | 6.2% | 5.3% |
| Importer of goods and services and exporter of services | 0.9% | 0.7% | 2.4% | 2.7% | 0.9% | 1.0% |
| Importer of goods and exporter of services | 0.6% | 0.5% | 0.4% | 0.5% | 0.3% | 0.4% |
| Importer of goods and exporters of goods and services | 0.4% | 0.3% | 0.3% | 0.3% | 0.5% | 0.4% |
| Exporter of goods and services | 0.2% | 0.2% | 0.2% | 0.1% | 0.6% | 0.2% |
| Importer of services and exporter of goods and services | 0.3% | 0.2% | 0.5% | 0.3% | 2.1% | 0.7% |

Note: Values identify shares across all trading firms.
Source: Own calculations based on data from SECEX, SISCOSERV and RAIS.

The distribution of traders according to firm size follows similar patterns to those of OECD countries.[4] That is, large firms employ most workers (72%) and represent the highest share of exports (59%) but they represent the smallest share of trading firms (7%) (Figure 5.3). By contrast, micro firms represent the largest share of firms (52%) but the smallest share of workers (2%) and an intermediate share of exports

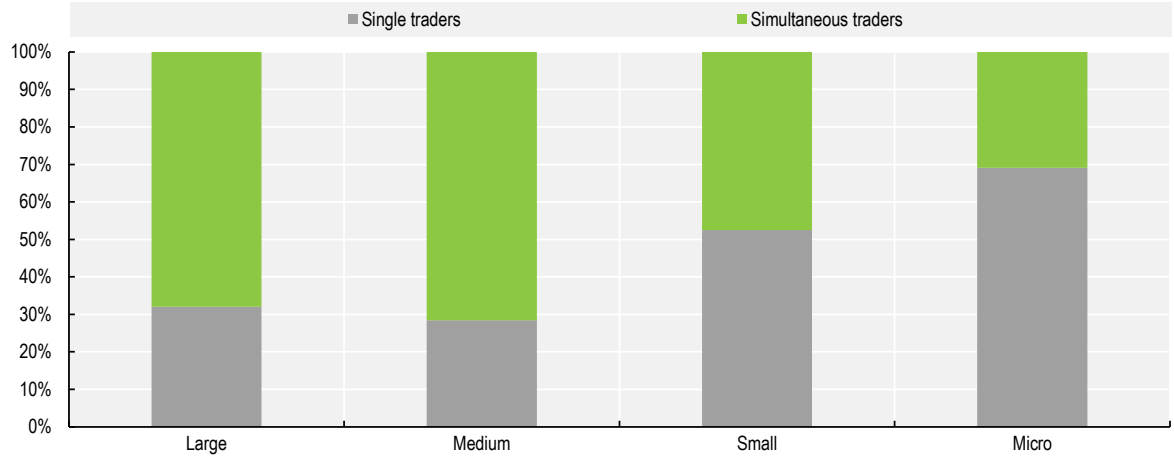
(17%). Overall, large firms tend to engage more readily in simultaneous trade while smaller, firms, particularly micro-sized, tend to be single traders whether of goods or of services (Figure 5.4).

## Figure 5.3. Large firms employ most workers, occupy the highest share of exports, but represent the smallest share of trading firms




Note: Large firms defined as those above 250 employees, Medium firms between 100 and 250, Small between 10 and 100 and micro fewer than 10.
Source: Own calculations from SECEX, SISCOSERV and RAIS.

## Figure 5.4. Large firms tend to engage in simultaneous trade, while smaller firms are largely single traders




Note: Large firms defined as those above 250 employees, Medium firms between 100 and 250, Small between 10 and 100 and micro fewer than 10.
Source: Own calculations based on data from SECEX, SISCOSERV and RAIS.

### *5.1.2. Existing evidence of trade in bundled products (simultaneous export of goods and services)*

Firms that export goods and services, or bundled products, irrespective of whether they import or not, represent around 13% of exports, 6.7% of employment and 2.3% of firms (Table 5.1). Bundles vary widely but some patterns emerge. In terms of number of bundles these include combination of manufactured goods, from transmission shafts to electrical transformers and rubber and plastics with maintenance services. In terms of highest value bundles, these concentrate in the light aircraft sector with a combination of engineering, consultancy and IT support (Table 5.2).

## Table 5.2. Most common combinations of bundles

| By number of times combination appears | | | |
|---|---|---|---|
| Good description | Service description | No. of bundles | Share of Exports |
| **HS – 8483: Transmission shafts** (including cam shafts and crank shafts) and cranks; | NBS -12001: maintenance and repair | 121 | 0.2% |
| **HS –7318: Screws, bolts, nuts,** coach screws, screw hooks, rivets, cotters, cotter-pins, washers (including spring washers) and similar articles, of iron or steel. | NBS -12001: maintenance and repair | 119 | 0.2% |
| **HS –8536: Electrical apparatus for switching or protecting electrical circuits**, or for making connections to or in electrical circuits (for example, switches, relays, fuses, surge suppressors, plugs, sockets, lamp-holders and other connectors, junction boxes | NBS -12001: maintenance and repair | 109 | 0.1% |
| **HS –8481: Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats or the like**, including pressure-reducing valves and thermostatically controlled valves | NBS -12001: maintenance and repair | 106 | 0.1% |
| **HS –4016:** Other articles of **vulcanised rubber other than hard rubber**. | NBS -12001: maintenance and repair | 104 | 0.1% |
| **HS –3926:** Other articles of **plastics and articles of other materials** | NBS -12001: maintenance and repair | 95 | 0.1% |

| By number of times combination appears | | | |
|---|---|---|---|
| Good description | Service description | No. of bundles | Share of Exports |
| **HS –9032**: **Instruments and apparatus for measuring or checking the flow, level, pressure or other variables of liquids or gases** (for example, flow meters, level gauges, manometers, heat meters) | NBS -12001: maintenance and repair | 89 | 0.2% |
| **HS –8504: Electrical transformers, static converters** (for example, rectifiers) and inductors. | NBS -12001: maintenance and repair | 86 | 0.1% |
| **HS –8501: Electric motors and generators** (excluding generating sets). | NBS -12001: maintenance and repair | 83 | 0.2% |
| **HS –7326: Other articles of iron or steel** | NBS -12001: maintenance and repair | 82 | 0.1% |
| By value of bundles | | | |
| Good description | Service description | No. of bundles | Share of Exports |
| **HS –8802: Other aircraft** (e.g. helicopters, aeroplanes) | NBS -11805: travel planning services and related services | 1 | 1.3% |
| **HS –8802: Other aircraft** (e.g. helicopters, aeroplanes) | NBS -11806: Other services in support of business activities | 1 | 1.2% |
| **HS –8802: Other aircraft** (for example, helicopters, aeroplanes) | NBS -11403: Engineering services | 2 | 1.1% |
| **HS –8802: Other aircraft** (for example, helicopters, aeroplanes) | NBS -11409: design of specialized services | 1 | 1.1% |
| **HS –8802: Other aircraft** (for example, helicopters, aeroplanes) | NBS -12205: Other educational services, including training, and support services | 1 | 1.0% |
| **HS –8802: Other aircraft** (for example, helicopters, aeroplanes) | NBS -11410: Services of technical and scientific advice | 1 | 1.0% |
| **HS –8802: Other aircraft** (for example, helicopters, aeroplanes) | NBS -12001: maintenance and repair | 2 | 0.9% |
| **HS –8411: Turbo-jets, turbo-propellers and other gas turbines**. | NBS -12001: maintenance and repair | 16 | 0.7% |
| **HS –8429:** elf-propelled **bulldozers, angledozers, graders, levellers, scrapers,** mechanical shovels, excavators, shovel loaders, tamping machines and road rollers. | NBS -11507: Service network management and infrastructure in information technology (IT) | 1 | 0.5% |
| **HS –8429:** elf-propelled **bulldozers, angledozers, graders, levellers, scrapers,** mechanical shovels, excavators, shovel loaders, tamping machines and road rollers. | NBS -11501: consulting, security and support in information technology (IT) | 1 | 0.5% |

Note: Top 10 number of bundles identified on basis of number of times combination appears. Top 10 value of bundles identified as top value of combined goods and services.
Source: Own calculations from SECEX, SISCOSERV and RAIS.

## 5.2. Using ICT goods and services to increase export performance

Existing analysis based on micro-data has shown that firms engaged in trade are not only larger and more productive but also create more jobs and pay higher wages (Melitz and Redding, 2014[2]). However, despite considerable advancements in the empirical findings of this *heterogeneous firm* literature, the specific role that ICT goods and services play in enabling firms to trade is not well understood. This, despite a wide acknowledgement that ICT inputs have the potential to play a critical role in productivity and in reducing trade costs (see World Bank (2016[3]), Baldwin (2016[4]), WTO (2018[5]) and Box 5.1).

### Box 5.1. ICT goods and services imports and firm level exports – a review of existing literature

The literature on heterogeneous firms offers important insights into how firms engage in trade and what benefits they draw from this engagement. More productive firms are able to meet the costs of engaging in international markets and, as a result, draw benefits associated with exporting (Melitz, 2003[6]). At the same time, access to more varieties of competitively priced inputs through imports is also associated with greater export competitiveness (Bas and Strauss-Kahn, 2014[7]). On aggregate, these trade

benefits can translate into higher productivity, more employment and higher wages, all of which are associated with economic growth and higher living standards (see (Alcalá and Ciccone, 2004[8])and (Sing, 2010[9])).

The role of ICT goods and services in this context is likely to be two-fold. First, a wider use of ICT goods and services should enable firms to increase productivity (Cardona, Kretschmer and Strobel, 2013[10]), by, for example, helping streamline processes or enabling access to, and use of, new digital technologies (e.g. productivity enhancing software and hardware). This will improve firms' ability to meet the fixed cost of engaging in export markets. At the same time, use of ICT goods and services can also affect trade costs (WTO, 2018[5]),, reducing the cost of gathering information about markets and enabling faster communication with suppliers and consumers, in turn, affecting both fixed and variable trade costs. Therefore, much like access to foreign intermediate inputs is associated with a positive effect on export decisions (Bas, 2012[11]), access to imported ICT goods and services, which embody a range of new digital technologies, could be expected to positively affect exports, including exports of goods, services and bundles of goods and service.

However, despite a wide acknowledgement of the potential contribution that ICT goods and services may play on firm ability to trade, there remains, to date, very little empirical evidence mapping the links between access to ICT goods and services from abroad and the trading behaviour of firms.

This section sets out to identify whether access to imported ICT goods and services, hereinafter ICT inputs, can enable greater export sales for Brazilian firms (noting a number of caveats discussed in Box 5.2).

### Box 5.2. Caveats to the analysis

Before delving into the analysis, there are several caveats to note. While the micro-data used for this analysis is very rich in terms of the trading activities of Brazilian firms, it is not possible to link this information to the characteristics of the firms themselves. This prevents the calculation of firm-level productivity measures (e.g. total factor productivity). It also complicates the use of firm specific controls in the econometric analysis, reducing the ability to identify what specific characteristics might be driving change. Moreover, while the data identifies when a firm imports ICT goods and services, it does not capture the use of domestically produced or procured ICT goods and services. It therefore misses an important channel for ICT adoption related to use of domestic inputs.

Finally, the analysis is unable to control for issues at the intersection of adoption and use. That is, existing literature suggests that data-driven innovation requires both access to new technologies but also the managerial capacity and know-how to drive innovation (Brynjolfsson and McElheran, 2016[12]). Since there is little visibility on the characteristics of firms, it will be difficult to control for such issues.

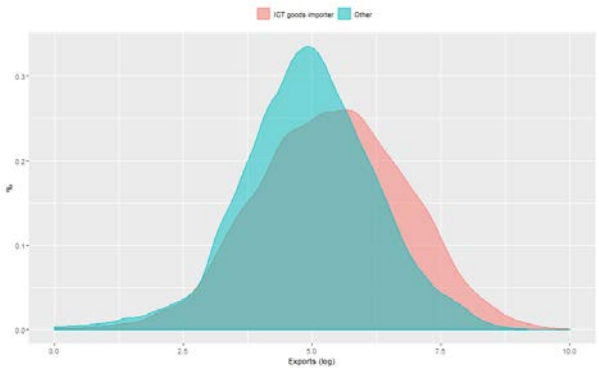
However, the data does provide a rich source of information, including on access to foreign ICT goods and services helping provide important insights for policy analysis.

### *5.2.1. Firms that import ICT goods and services tend to export more*

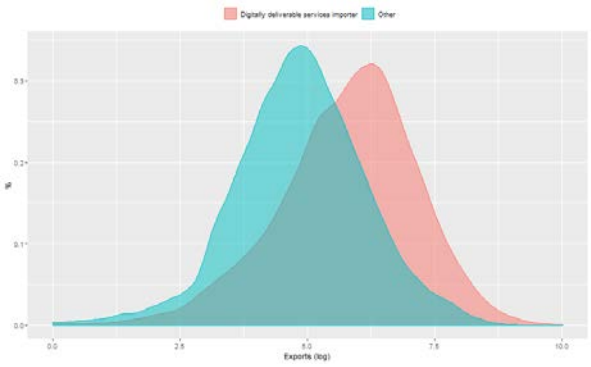
Preliminary evidence suggests that Brazilian firms that import ICT goods and digitally deliverable services tend to export more than those that do not, especially in the case of the latter (Figure 5.5). However, it is possible that there are factors which make firms more prone to exporting that also make them more prone to importing these such as technical capacity. A more formal analysis is needed to better identify the links between imports of ICT inputs and export competitiveness.

## Figure 5.5. ICT goods and services importers tend to export more

a. ICT goods importers




b. Digitally deliverable services importers




Note: Frequency distribution.
Source: Own calculations based on SECEX and SISCOSERV data.

### *5.2.2. Imported ICT inputs are especially important for goods exports and for micro-sized firms*

A more formal, econometric, analysis is undertaken to better identify the links between imports of ICT inputs and export competitiveness. However, this is not without complications (Box 5.2). In order to enable identification, the analysis exploits variance across firms exporting the same product to the same market, comparing whether those that import ICT inputs have witnessed higher sales. This is done through a gravity-type estimation using firm level data (Box 5.3).

The results show that imported ICT inputs are especially important for firms that export goods, a category of trade that is one of the most important in Brazil (Table 5.3). Indeed, goods exporters that import tend to export more, but an additional boost is given to their competitiveness when they import ICT inputs.

### Box 5.3. Empirical strategy: Using ICT goods and services to increase export performance

The impact of importing ICT goods and services to increase export performance is identified using a gravity-type setup. Exports of firm *i* at time *t* in product *p* to partner *c* are a function of four types of variables.

1. *Firm characteristics*: comprising sector or activity, size and trading status (whether a firm trades goods, services).
2. *Import use, including ICT*: comprising whether or not firms import any product and if they import ICT goods, services or both.
3. *Policy variables*: including measures of absolute services restrictions as well as measures of regulatory heterogeneity derived from the OECD's Services Trade Restrictiveness Index database as well as participation in FTAs.
4. *Other trade costs*: which include variables such as distance, common language, the presence of common borders and other such.

So that the following baseline specification is estimated using a PPML approach with high dimensional fixed effects:

$$Exports_{i,t,s,c} = firm_{i,t,s} + ImportICT_{it} + Policy_{t,s,c} + Other\_t\_costs_{t,s,c}$$

Four broad categories of Fixed effects (FE) are used in the identification strategy.

- The first are year-product-market. The idea is to compare firms that sell the same product to the same market but which are different in their use of ICT.
- The second are year-sector-market. This is a similar specification capturing between effects but at the sector rather than the product level. One issue is that differences may be drive by differences in the products traded.
- The third looks at within variation through firm-product-partner and year FE. This aims to identify whether firms that have started importing ICT goods/services have witnessed bigger changes in exports than those that have not. To a certain extent, this is a somewhat restrictive model in that it requires for there to be a change in the ICT USE status to identify an impact.
- The last uses firm, sector, partner and year fixed effects separately.

The main variable of interest is the coefficient on the ICT variables across different categories of products. A positive impact is expected to show that firms that import ICT goods and/or services, can increase their export competitiveness more than those that do not.

### Table 5.3. Imported ICT inputs matter for firms that export goods

| | Services | Goods | DD services | non DD services |
|---|---|---|---|---|
| Employees (log) | 0.3406*** (0.0546) | 0.2756*** (0.0458) | 0.2964*** (0.0535) | 0.4576*** (0.1019) |
| Importer | -0.0835 (0.2396) | 0.2686* (0.1257) | 0.4935. (0.2528) | -0.2206 (0.2180) |
| Importer of ICT good or services | 0.4728. (0.2657) | 0.3077** (0.1081) | -0.1245 (0.1739) | 0.6365. (0.3531) |
| | | | | |
| Year-country-Product FE | YES | YES | YES | YES |
| Observations | 409,730 | 1,061,746 | 130,987 | 278,743 |
| Pseudo R2 | 0.67 | 0.80 | 0.61 | 0.73 |

Note: Analysis using detailed firm level data from 2014 to 2019, robust standard errors clustered at firm level (*** p<0.010; ** p<0.05;* p<0.10).
Source: Authors' calculations.

Moreover, the analysis also reveals that imported ICT inputs are especially important for micro-sized firms across services (Table 5.4). That is, micro-sized firms that import ICT inputs witness larger increases in exports than those that do not.

Overall, the analysis highlights that access to ICT goods and services via imports can be an important determinant of export competitiveness of Brazilian goods exporters, especially in the case of micro-sized firms.

### Table 5.4. Imported ICT inputs are especially important for micro-sized firms

| | Services | Goods | DD services | Non DD services |
|---|---|---|---|---|
| Employees (log) | 0.1478 (0.0914) | 0.1494 (0.1212) | 0.1524 (0.0973) | 0.1362 (0.2063) |
| Importer | -0.03761 | 0.2374 (0.1658) | -0.1498 (0.2176) | -0.3911. (0.2179) |
| Importer of ICT goods or services | 0.7764*** (0.1640) | 0.3370 (0.2883) | 0.6546* (0.2589) | 0.8892*** (0.2432) |
| | | | | |
| Year-country-Product FE | YES | YES | YES | YES |
| Observations | 93,741 | 160,758 | 32,107 | 61,634 |
| Pseudo R2 | 0.63296 | 0.81155 | 0.57901 | 0.6289 |

Note: Analysis using detailed firm level data from 2014 to 2019, estimations undertaken on a subset of firms that are below 10 employees. Robust standard errors clustered at firm level (*** p<0.010; ** p<0.05;* p<0.10).
Source: Authors' calculations.

## 5.3. Enabling greater access for Brazilian services

While services represent nearly three-quarters of Brazilian GDP, they account for only 12% of overall exports in 2019. This is a recurring pattern across many countries and is due to several factors. The first is that many services have to be provided in person, making these difficult to trade across borders. The second is that there is wide regulatory heterogeneity for services across countries (OECD, 2017[13]) which can make it difficult for firms to operate across markets. The third, are structural factors such as language, culture or differences in time-zones. While the digital transformation has enabled more trade in services, including those that were previously non-tradeable (López González and Jouanjean, 2017[14]), it has also resulted in growing digital trade restrictiveness (Ferencz, 2019[15]).

This section relies on micro-data to identify how services exports, including those that are digitally deliverable, are affected by regulatory measures in destination countries. The aim is to help policy makers get a clear view of the issues that affect Brazilian exporters' capacity to thrive in the digital environment. The first section sets the scene, providing context to the empirical strategy and describing some overarching trends. The second section provides the main results of the empirical analysis and the third section concludes with some policy observations.

### *5.3.1. Do barriers to digitally enabled services affect Brazilian firms ability to engage in services exports?*

Services trade costs can be large, affecting the ability of countries to sell in foreign markets and reducing access to important services inputs via imports (OECD, 2017[16])). Indeed, according to Benz (2017[17]) the *tariff equivalent* of services trade restrictions are, on average, between 20% and 300% and can be as high as 2000% for specific sectors. These are in-line with much of the existing empirical literature which also highlights a wide degree of heterogeneity across different sectors.

To make the most out of the evolving digital trade environment, it is important to understand how different regulatory obstacles affect firms' ability to access markets. This section looks at different facets of this question, looking first at aggregate impacts of different barriers on digitally deliverable and non-digitally deliverable services and then at how these play out across firms of different size (Box 5.4).

#### Box 5.4. Empirical strategy: Impact of barriers to digitally enabled services on Brazilian services exports

The impact of services trade restrictions on Brazil's exports are identified using a gravity-type setup. Exports of services of firm *i* at time *t* in sector *s* to partner *c* are a function of three types of variables.

1. *Firm characteristics*: comprising sector or activity, size and trading status (whether a firm trades goods, services).
2. *Policy variables*: including measures of absolute services restrictions as well as measures of regulatory heterogeneity derived from the OECD's Services Trade Restrictiveness Index database as well as participation in FTAs.
3. *Other trade costs*: which include variables such as distance, common language, the presence of common borders and other such.

So that the following baseline specification is estimated using a PPML approach with high dimensional fixed effects:

$$Exports_{i,t,s,c} = firm_{i,t,s} + Policy_{t,s,c} + Other\_t\_costs_{t,s,c}$$

Four broad categories of fixed effects (FE) are used to control for unobserved but likely important factors:

- The first are those that control for firm-specific characteristics (such as productivity) but which allow variation across markets (year-firm-product and sector fixed effects). This will capture how a particular firm selling across different markets is affected by different DSTRI measures. A downside to this identification strategy is that, while it enables controlling for firm specific effects, it requires that a firm sells across different markets. This means that the sample of firms is restricted to those trading the same products in more than one market.
- The second are those that control for year-firm-sector and product fixed effects. The model is like the one above but less restrictive in that it compares the same firm selling different products in the same sector in different countries. Same issue applies in that to identify an impact firms have to sell products in at least two markets.
- The third relates to within variation using firm-product-partner and year FE. This will identify how changes in trade of a particular firm in a particular product and marker are affected by changes in the STRI scores of that market. Since it captures within changes, this does not require firms to export in various markets but issues might arise due to low variance in STRI scores in time.
- The last also exploits the within variation but this time in the context of firm-sector-partner and year FE. This means it is less restrictive in that it can compare firms that sell different products in the same sector.

The key variable of interest in these specifications will be the STRI variable which captures three main elements. The first is the overall impact of services trade restrictions, the average STRI. The second, the impact of the Digital STRI. The third the disaggregated measures of the DSTRI capturing specific aspects of the digital trade environment (such as infrastructure, payments and other). Interest is also in whether some sectors stand out in terms of negative impacts and if it is possible to identify how digital restrictions affect digitally deliverable services exports, with breakdown according to whether larger firms are more affected than smaller ones.

The analysis is undertaken using detailed firm level data under a gravity-type setup. It exploits variation across countries controlling for year-firm-sector and product specific characteristics. The analysis shows that regulatory obstacles related to digital trade have a significant negative impact on Brazilian firms ability to export services (Table 5.5). The impact is particularly high on digitally deliverables services exports, an area where Brazil has been developing strong comparative advantage in the region.[5]

### Table 5.5. Digital services restrictions reduce services exports of Brazilian firms

| | All services | DD services | Non-DD services |
|---|---|---|---|
| Digital STRI | -3.776*** (0.8037) | -5.127*** (0.9408) | -1.807** (0.6673) |
| Employees (log) | -1.72e-8 (1.84e-8) | -9.91e-12 (8.7e-9) | 8.73e-8 (1.08e-7) |
| Contiguity | 1.637* (0.8270) | 2.103* (0.8931) | 0.2188 (0.4033) |
| Common language | -0.0340 (0.5074) | 0.1214 (0.7197) | -0.1882 (0.2206) |
| Common currency | -1.578* (0.6358) | -2.222** (0.8301) | -0.8528 (0.7802) |
| Common religion | -0.2308 (0.3219) | -0.2792 (0.4419) | 0.0373 (0.2858) |
| Common legal origins (pre 1991) | 0.6542. (0.3425) | 0.9329. (0.5011) | 0.4482 (0.3172) |

| | All services | DD services | Non-DD services |
|---|---|---|---|
| Common legal origins (post 1991) | -0.9628*** (0.2730) | -1.097* (0.4338) | -1.107*** (0.1541) |
| FTA | 0.1222 (0.4042) | 0.3321 (0.5763) | -0.1059 (0.2842) |
| GDP of partner country (log) | 0.4576*** (0.0995) | 0.5483*** (0.1252) | 0.3322** (0.1184) |
| Distance (log) | -1.153** (0.3658) | -1.360** (0.4900) | -0.8487* (0.3726) |
| | | | |
| Year-Firm-Sector – FE | Yes | Yes | Yes |
| Product – FE | Yes | Yes | Yes |
| Observations | 409,595 | 130,856 | 278,555 |
| Pseudo R2 | 0.80 | 0.76246 | 0.86 |

Note: Analysis using detailed firm level data from 2014 to 2019, robust standard errors clustered at firm level (*** p<0.010; ** p<0.05;* p<0.10).
Source: Authors' calculations.

### *5.3.2. What type of barriers matter for Brazilian exporters?*

The type of restrictions faced by Brazilian firms matter (Table 5.6). Although difficult to compare across estimations, barriers related to payment systems, intellectual property rights, other barriers and infrastructure and connectivity all constitute important impediments for Brazilian exporters of digitally deliverable services.[6]

**Table 5.6. Restrictions are especially important on payment systems, intellectual property and infrastructure and connectivity**

| | Infrastructure and connectivity | Electronic transactions | Payment systems | Intellectual property rights | Other barriers |
|---|---|---|---|---|---|
| Digital STRI | -9.721*** (1.430) | 0.1901 (8.198) | -42.65*** (9.975) | -38.76*** (4.880) | -31.20*** (5.011) |
| Employees (log) | 1.66e-11 (5.34e-9) | -1.67e-12 (6.43e-9) | 1.49e-12 (3.11e-9) | -4.65e-12 (7.49e-9) | 1.26e-11 (4.42e-9) |
| Contiguity | 2.759*** (0.6840) | 0.2642 (0.9793) | 0.7982 (0.8718) | 0.6509 (0.8919) | 0.3288 (0.8941) |
| Common language | -0.4002 (0.5120) | -0.2242 (0.5633) | 0.5115 (0.4983) | -0.1192 (0.5178) | 0.5218 (0.5009) |
| Common currency | -6.324*** (0.7511) | -8.602*** (1.517) | -6.708*** (0.7607) | -6.691*** (0.8113) | -5.560*** (0.6867) |
| Common religion | -0.4320 (0.5425) | -0.4177 (0.5383) | -0.6223 (0.6287) | -0.5222 (0.5240) | -0.1916 (0.6678) |
| Common legal origins (pre 1991) | 1.887*** (0.4338) | 3.091*** (0.5032) | 3.512*** (0.6212) | 3.331*** (0.5257) | 3.398*** (0.6710) |
| Common legal origins (post 1991) | -2.094*** (0.2657) | -3.178*** (0.3186) | -3.128*** (0.2436) | -3.407*** (0.2567) | -3.031*** (0.2457) |
| FTA | 0.0010 (0.5309) | -1.915* (0.8353) | -1.063. (0.5656) | -0.5406 (0.5878) | -1.391* (0.5803) |
| GDP of partner country (log) | 0.8388*** (0.0508) | 0.9232*** (0.0570) | 0.9737*** (0.0573) | 0.9272*** (0.0585) | 1.042*** (0.0636) |
| Distance (log) | -2.621*** (0.2676) | -3.313*** (0.5294) | -2.202*** (0.2349) | -2.787*** (0.3020) | -1.944*** (0.2235) |
| | | | | | |
| Year-Firm-Sector – FE | Yes | Yes | Yes | Yes | Yes |
| Product – FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 2,060,168 | 2,060,168 | 2,060,168 | 2,060,168 | |
| Pseudo R2 | 0.66774 | 0.66039 | 0.66731 | 0.66314 | |

Note: Analysis using detailed firm level data from 2014 to 2019, robust standard errors clustered at firm level (*** p<0.010; ** p<0.05;* p<0.10).
Source: Authors' calculations

### *5.3.3. Do regulatory restrictions impact Brazilian services exporters of different sizes in the same way?*

Not all Brazilian firms will face the same restrictions in the same manner. Where digitally deliverable services are concerned, restrictions are important across firms of all sizes but they are most trade reducing for smaller firms, especially those between 10 and 50 employees (Table 5.7). In terms of non-digitally

deliverable services, restrictions, as identified by the Digital Services Trade Restrictiveness Index, appear to only affect small and micro firm exports (Table 5.8).

### Table 5.7. Smaller firms exporting digitally deliverable services are most impacted by digital trade obstacles abroad

| | Large | Medium | Small | Micro |
|---|---|---|---|---|
| Digital STRI | -4.446*** (0.8306) | -3.999*** (0.9607) | -5.646*** (1.221) | -4.174*** (1.092) |
| Employees (log) | -4.29e-6 (0.0011) | 8.5e-6 (0.0002) | -2.74e-8 (1.22e-7) | -4.97e-7 (8.59e-7) |
| Contiguity | 2.247* (0.9628) | 0.0467 (0.3624) | 0.3550 (0.5822) | -1.35* (0.6442) |
| Common language | 0.4644 (0.9860) | -0.6118. (0.3142) | -0.0759 (0.3254) | -1.112* (0.4381) |
| Common currency | -3.241** (1.206) | -0.5661 (0.7144) | -0.5151 (1.209) | -2.422 (1.554) |
| Common religion | -0.1029 (0.7607) | -0.1289 (0.4153) | -0.2494 (0.3416) | -0.2309 (0.3769) |
| Common legal origins (pre 1991) | 0.6728 (0.7618) | 1.851*** (0.3341) | 0.9903* (0.4227) | -0.1029 (0.6684) |
| Common legal origins (post 1991) | -1.068. (0.5966) | -1.834*** (0.2222) | -0.5656532 | 0.2461 (0.6161) |
| FTA | 0.2018 (0.7508) | 0.6207 (0.7486) | 0.6144 (0.7077) | -1.045* (0.5264) |
| GDP of partner country (log) | 0.6815*** (0.1681) | 0.3795*** (0.0493) | 0.3827*** (0.0577) | 0.2967*** (0.0593) |
| Distance (log) | -1.901** (0.6371) | -0.4355 (0.3163) | -0.2097 (0.5343) | -1.035** (0.3466) |
| | | | | |
| Year-Firm-Sector – FE | Yes | Yes | Yes | Yes |
| Product – FE | Yes | Yes | Yes | Yes |
| Observations | 34,004 | 32,072 | 32,685 | 32,091 |
| Pseudo R2 | 0.74955 | 0.78971 | 0.82544 | 0.85131 |

Note: Analysis using detailed firm level data from 2014 to 2019, robust standard errors clustered at firm level (*** p<0.010; ** p<0.05;* p<0.10).

### Table 5.8. Smaller firms exporting non-digitally deliverable services are most impacted by digital trade obstacles abroad

| | Large | Medium | Small | Micro |
|---|---|---|---|---|
| Digital STRI | -1.034 (1.139) | -1.757* (0.7736) | -2.950*** (0.6097) | -3.379*** (0.6664) |
| Employees (log) | 0.0001 (0.0002) | -1.07e-6 (3.19e-6) | 5.35e-7 (2.6e-5) | 1.17e-6 (1.42e-6) |
| Contiguity | 0.1824 (0.4857) | -0.6394 (0.5194) | -0.3036 (0.3715) | 0.0440 (0.3613) |
| Common language | -0.1571 (0.4108) | 1.187*** (0.2108) | 0.2427 (0.3881) | 0.0302 (0.2154) |
| Common currency | -2.353. (1.294) | 0.1841 (0.6367) | 0.5153 (0.7645) | 0.1188 (0.9167) |
| Common religion | 0.2478 (0.4934) | -0.3589. (0.2074) | -0.1472 (0.1787) | -0.1201 (0.4473) |
| Common legal origins (pre 1991) | 0.1431 (0.5952) | 0.6722. (0.3590) | 0.7720* (0.3043) | 1.546*** (0.2923) |
| Common legal origins (post 1991) | -1.052*** (0.2433) | -0.9545** (0.3369) | -1.267*** (0.2759) | -1.848*** (0.2300) |
| FTA | -0.7089. (0.4208) | 0.2710 (0.3646) | 0.0875 (0.4087) | 1.024. (0.6055) |
| GDP of partner country (log) | 0.4117* (0.1886) | 0.2543*** (0.0460) | 0.2354*** (0.0545) | 0.2313*** (0.0602) |
| Distance (log) | -1.484** (0.5623) | -0.4464* (0.225) | -0.2082 (0.3467) | -0.1354 (0.3730) |
| | | | | |
| Year-Firm-Sector – FE | Yes | Yes | Yes | Yes |
| Product – FE | Yes | Yes | Yes | Yes |
| Observations | 31,957 | 93,427 | 91,550 | 61,616 |
| Pseudo R2 | 0.86546 | 0.82907 | 0.83031 | 0.80486 |

Note: Analysis using detailed firm level data from 2014 to 2019, robust standard errors clustered at firm level (*** p<0.010; ** p<0.05;* p<0.10).

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## Notes

[1] This is likely to include what might be considered as ‘indirect trade’ where goods and services produced domestically or abroad are sold by retail companies.

[2] Single traders refers to firms that only engage in either exports of goods or exports of services or imports of goods or imports of services. Simultaneous exporters are those that engage in more than one channel, including exporters of goods AND exporters of services or other combinations of goods and services imports or exports.

[3] These number are comparable to the emerging literature that looks at simultaneous imports and exports of goods and services (Ariu et al., 2019[18]).

[4] See, for example, https://data.oecd.org/trade/exports-by-business-size.htm.

[5] These results are robust to different specification including different sets of fixed effects, from year-firm-product and sector-fixed effects to individual year, product, firm, sector-fixed effects.

[6] Unlike in other estimations, it is difficult to compare the DSTRI scores across different categories because each has to be evaluated against a different mean. For instance, while the coefficient is smaller on the infrastructure and connectivity estimations, this variable has a higher mean than the others.

# Digital Trade Review of Brazil

This *Digital Trade Review of Brazil* provides an overview of Brazil's participation in digital trade and the related regulatory environment. It provides insights into how Brazil might ensure that the new challenges raised by the digital transformation for trade can be managed and the benefits shared more inclusively. While Brazil has embraced the digital transformation and has strong potential to benefit from digital trade, it will need to continue the ongoing process of regulatory reform. This includes reducing tariff and non-tariff barriers to trade on ICT goods; reducing regulatory barriers to ICT services; increasing engagement in international discussions on digital trade; and continuing efforts to bridge digital divides.

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