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20 Years of the Information Technology Agreement

Boosting trade, innovation and digital connectivity



What is the Information Technology Agreement?

The Information Technology Agreement commits participants to completely eliminate tariffs on information technology products covered by the Agreement. Currently 82 WTO members participate in the ITA, representing 97 per cent of world trade in ITA products.

Using this publication

Each chapter starts with a highlights section, summarizing the main points. A full list of ITA participants and the dates they joined the Agreement can be found at the back of the publication.

Find out more

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20

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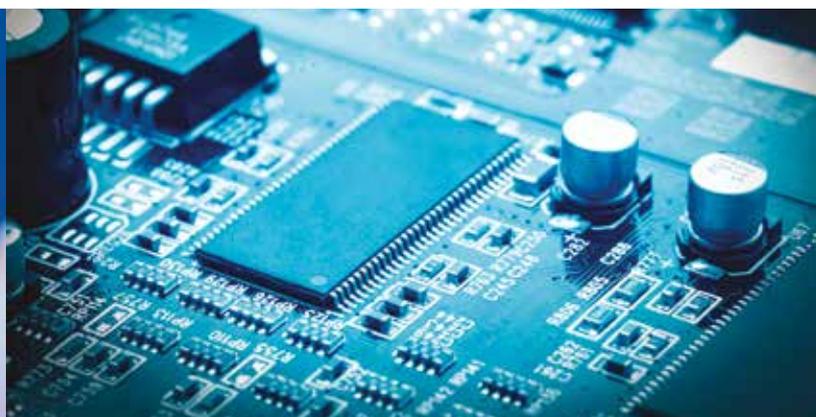
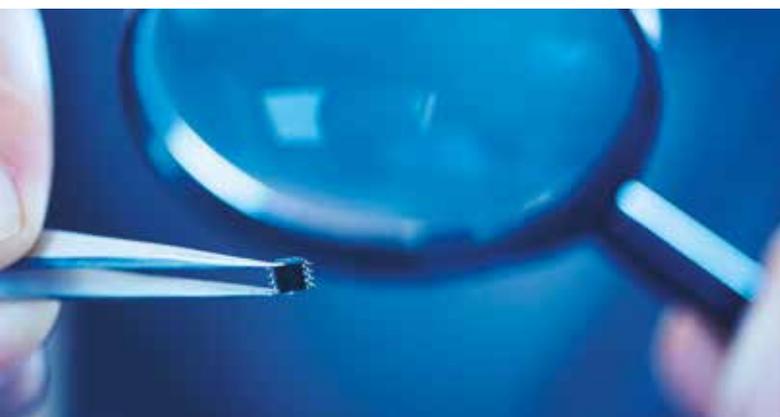
Foreword by WTO Director-General Roberto Azevêdo

2017 marks the twentieth anniversary of the WTO's Information Technology Agreement (ITA). The ITA was a landmark deal for the global trading system not only because it was the first to be signed after the establishment of the WTO in 1995, but also because it has helped to support and facilitate the phenomenal growth of trade in the information technology sector.

Exports in the products covered by the ITA tripled from US\$ 549 billion in 1996 to approximately US\$ 1.7 trillion in 2015. This represents an annual growth rate in these exports of 6 per cent. ITA exports account for a remarkable 15 per cent of global manufacturing exports, despite the falling prices of some of the main ITA product categories. On this basis, global trade under the ITA is bigger than trade in automotive products or pharmaceuticals.

ITA membership has also increased over the years – from 29 WTO members in 1996 to 82 at the time of publication. ITA participants now account for approximately 97 per cent of world trade in the products covered by the Agreement. All participants have completely eliminated import duties and other charges on key goods and inputs for the IT sector. In a world where goods and component parts often cross borders many times before they reach market, this is essential in fostering trade.

Of course, the ITA is not only about eliminating duties and expanding trade, it is also about stimulating innovation and spreading new technologies. By lowering costs for IT products, the Agreement has contributed to the adoption and diffusion of computers and mobile phones, thereby helping more people to become connected. This helps consumers and businesses alike – particularly





small and medium-sized enterprises. In addition, the ITA has helped to improve the trading environment for IT products by improving predictability for business and fostering investment in the participants' economies.

Inspired by the successful experience of the ITA, a group of WTO members struck another deal to eliminate tariffs on a new range of IT products in December 2015, during the WTO Ministerial Conference in Nairobi. Trade in these products accounts for around US\$ 1.3 trillion a year. The expanded ITA is already working to make new-generation ICT goods cheaper, thereby spreading digital connectivity even further. Together, the ITA and ITA expansion represent important drivers behind the diffusion of information technology and innovation, and towards affordable access to the Internet.

This publication celebrates the ITA's twentieth anniversary, reviews the impact of the ITA and its expansion, and shares insights on the role of information technology for development, including its contribution to the 2030 Sustainable Development Agenda. As WTO members explore paths to advance the multilateral trading system in the years ahead, the ITA experience, as documented here, may provide some useful lessons.

A handwritten signature in black ink, reading "Roberto Azevêdo".

Roberto Azevêdo
Director-General



Executive summary

- Since its entry into force in July 1997, the Information Technology Agreement (ITA) has eliminated tariffs on a range of information technology products with a current annual value of approximately **US\$ 1.7 trillion**.
- Initially signed by 29 members, the ITA saw the number of its participants rise quickly. Today the ITA includes **82 WTO members** and covers **97 per cent** of world trade in IT products.
- Over the past 20 years, world ITA exports have more than tripled in value and now represent **15 per cent** of total merchandise exports, exceeding the shares of automotive products, textiles and clothing, and pharmaceuticals.
- In 20 years of operation, the ITA has deepened developing economies' integration into global production networks. A remarkable change in ITA trade has been the emergence of Asian economies, particularly China. In 2015, **seven of the top ten** ITA exporters were Asian.
- Participation in the ITA boosted developing economies' exports of ITA products to the world. Developing economies' share of ITA exports rose from **26 per cent in 1996** to **63 per cent in 2015**. In the same period, their share in total world exports only grew from 27 per cent to 43 per cent.
- The “zero-in zero-out” tariffs under the ITA eliminated costly administrative burdens at customs and reduced delays for goods crossing borders, **facilitating trade in ITA products**.
- By binding and eliminating duties and other charges on ITA products in their WTO schedules, ITA participants extend **duty-free treatment** to all WTO members on a **most-favoured nation (MFN)** basis, thereby bringing the benefits of the agreement to the entire WTO membership.
- The binding nature of tariff-cutting commitments under the ITA has increased the certainty of the trading environment for ITA participants, creating predictability for businesses and rendering participants more attractive to investment and to hosting multinational firms, **thereby improving their competitiveness**.
- The ITA has had a positive impact on trade and the economy but not all participants have benefitted from trade opening in the same way. The costs associated with tariff elimination and market opening **must be counterbalanced** by regulatory reforms and other policies aimed at boosting productivity and enhancing innovation for the benefit of the economy as a whole.



▪ Over the past 20 years, the information and communications technology (ICT) sector has evolved dramatically as a result of technological innovation, consumer preferences and changing prices. This prompted **54 WTO members** to decide to expand the product coverage of the ITA to further liberalize trade in the ICT sector. The expansion negotiations were concluded on **16 December 2015** at the 10th WTO Ministerial Conference in Nairobi, Kenya.

▪ Under the ITA expansion, import duties and other charges are being reduced to zero on **201 high-tech products**, such as new-generation integrated circuits, touchscreens, GPS navigation equipment and medical equipment, with an annual value of about US\$ 1.3 trillion, accounting for approximately 10 per cent of world trade in goods. By 2019, **89 per cent** of tariff lines will be duty-free and the remaining products will have an average duty of around **1 per cent**.

▪ By reducing the price of ICT goods, the ITA has helped to increase the availability of products such as mobile phones in developing economies and has led to the wider use of new technology. In 2016, import prices of computers and semiconductors were **66 per cent lower** than when the ITA entered into force.

▪ The lower cost and greater availability of computers and mobile phones has resulted in increased access to the Internet and the growth of the digital economy, **creating new opportunities for trade**.

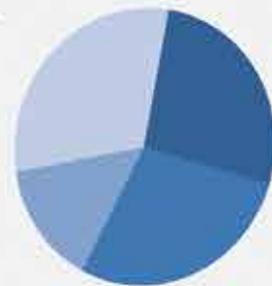
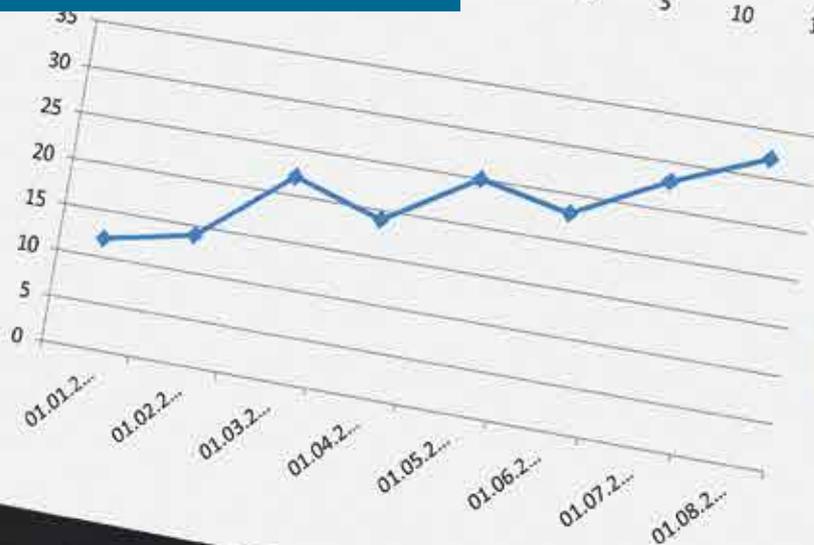
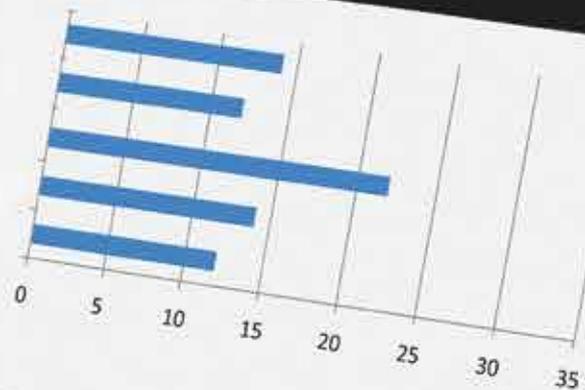
▪ Despite a reduction in prices, the cost of ICT goods continues to represent a barrier to accessing technology. In economies that are not participants to the ITA, tariffs are as high as **45 per cent** on certain ICT imports. For products which are now covered by the ITA expansion, tariffs can go up to **87 per cent**.

▪ Removing tariffs on ICT products can help to make these products more affordable and to unlock the economic and social benefits that may be derived from technology and the use of the Internet. Participation in the ITA and the ITA expansion can be a **driver for reforms**.

▪ By supporting the wider use of technology and innovation, the ITA is contributing to meeting the **United Nations Sustainable Development Goal** of universal and affordable access to the Internet by 2020. In 2016, **53 per cent** of the world population was "offline", and of the **47 per cent** of people using the Internet, only **one out of seven** lived in least-developed economies. Internet users in developing and least-developed economies mainly connect via mobile technology, as fixed-broadband services are three times more expensive than mobile-broadband services. Further participation in the ITA will help to bridge this digital divide.



Chapter 1



- *Since its entry into force in July 1997, the Information Technology Agreement (ITA) has eliminated tariffs on a range of information technology products, with an annual value of US\$ 1.7 trillion by 2015.*
- *Slashing tariffs under the ITA has eliminated costly administrative burdens at customs and reduced delays for goods crossing borders, thereby facilitating access to IT products.*
- *By reducing the barriers to accessing the information and communications technology (ICT) sector, the ITA can play an enabling role in technology diffusion and innovation.*

The effects of trade liberalization under the ITA

One of the objectives of the 1996 ITA Declaration was to open up trade in information technology products¹ through the elimination of customs duties and other charges on selected IT products (i.e. "ITA products")² on a most-favoured nation, or MFN (i.e. the principle of not discriminating between one's trading partners) basis. After twenty years of operation, the ITA has opened up trade in goods worth more than US\$ 1.7 trillion by 2015 and currently counts 82 WTO members, accounting for 97.1 per cent of trade in ITA products.

This chapter, on the effects of tariff reduction and elimination brought about by the ITA on the trade and economic performance of its participants, is based on a working paper produced by the WTO Secretariat, entitled "The Layers of the IT Agreement's Trade Impact".³ This represents the first comprehensive analysis of the ITA's impact on trade flows. In light of the scarce literature on the trade impact of the ITA,⁴ Henn and Gnutzmann-Mkrtchyan (2015) seek to integrate into the analysis recent insights from the literature on both global value chains (GVCs) and time in trade, and to introduce tariff data directly into the analysis for the first time.

According to Henn and Gnutzmann-Mkrtchyan (2015), participation in the ITA has contributed to developing the information and communications technology (ICT) sector and boosting trade in developed and developing economies alike through the reduction of trade costs and by improving the investment climate associated with the reduction of tariffs. In addition, the binding nature of tariff liberalization commitments undertaken under the ITA and their enforceability through the WTO dispute settlement system have contributed to increasing trade policy certainty and creating a more favourable enabling environment for business.

Besides the effects on trade and the economy that derive directly from the reduction of customs duties, Henn and Gnutzmann-Mkrtchyan (2015) argue that setting tariffs to zero under the ITA had an additional impact, which was the elimination of costly administrative burdens and time delays in crossing borders, as no tariff had to be paid. This is particularly important for a sector like

ICT, in which trade in intermediate goods – i.e. goods that are used in the production of a finished product – makes up a big part of the commercial transactions.

At the same time, it is important to note that not all the participants have benefitted from the ITA in the same way, due to different circumstances. Some studies indicate that implementation of this agreement has been particularly challenging for those economies that are latecomers to industrial manufacturing and innovation.⁵ According to these studies, the varying degree of success of trade liberalization depends on a mix of factors such as an economy's political and economic institutions, its support policies, market size and level of industrialization, and its capability to unlock potential for innovation and growth. If the right conditions are in place, participants in the ITA, including developing and least-developed economies, can reap the benefits of such participation, as shown in the analysis provided below.

A. An analysis of the impact of the ITA on trade flows

According to Henn and Gnutzmann-Mkrtchyan (2015), the trade impact of the ITA can be seen from different angles.⁶ First, against the backdrop of supply chain integration, tariff reduction under the ITA affects both imports and exports simultaneously, thereby supporting the integration of ITA participants into global value chains. Second, the study shows that impacts vary depending on an economy's reason for joining the ITA, reflecting to some extent the initial state of its ITA sector. In this regard, Henn and Gnutzmann-Mkrtchyan distinguish between what they call "active" signatories – mainly original signatories with a more established ITA sector – and "passive" signatories – i.e. economies with a much smaller ITA sector that joined after 1997, mainly as a prerequisite for a larger policy objective.⁷ Third, in a vertically fragmented sector such as ICT, impacts can also vary between economies in different positions in global value chains, depending on whether an economy is positioned upstream (exporting intermediates) or downstream (importing intermediates/exporting final goods).⁸

A one per cent tariff reduction of ITA products would cause a 0.7 to 0.8 per cent increase in their imports.

Effects of tariff reduction and elimination under the ITA

The impact of the ITA on imports is particularly relevant, as the agreement is about the reduction towards complete elimination of tariffs and other duties and charges on all imports of products covered by the ITA Declaration. However, the agreement also has a noticeable effect on exports, which is illustrated in the section below.

With respect to tariff reduction, Henn and Gnutzmann-Mkrtyan (2015) estimate that a 1 per cent tariff reduction of ITA products would cause a 0.7 to 0.8 per cent increase in their imports.⁹ This is explained by the fact that demand for ITA goods is "elastic" with regard to price, meaning that cutting tariffs on ITA imports lowers their price and raises demand for them. By helping to decrease the price of ITA goods through tariff reduction, the agreement has helped to facilitate the adoption and diffusion of key ICT goods, such as mobile phones, in participating developing economies.¹⁰

Moreover, the complete elimination of customs duties and other charges has an additional impact on ITA imports, above and beyond that of tariff reduction. Setting tariffs to zero eliminates costly administrative burdens and time delays in crossing borders, which slow down merchandise trade and have substantial effects on trade flows.¹¹ Tariff elimination is especially important for ITA goods, more

Removing tariffs on all ITA goods is estimated to boost their imports by 10-13 per cent across all goods.

so than for other ICT goods or for the broader machinery sector, due to the ITA sector's high integration into global value chains, so that burdensome border formalities imply high costs which are reflected in lower trade values.

According to Henn and Gnutzmann-Mkrtyan (2015), removing tariffs on all ITA goods is estimated to boost their imports by 10-13 per cent across all goods, and the impact on intermediate goods is even higher, in the range of 14-20 per cent, probably because of the importance of these goods within global value chains. In the case of the ITA, tariffs applied by all participants on covered products before their accession to the ITA were already relatively low, ranging from an average of 5.2 per cent for original signatories to 6.2 per cent for late signatories.¹² This seems to demonstrate that removing a tariff, even if it is small, will achieve a much higher impact on ITA imports than reducing a high tariff by several percentage points without reaching zero.

The positive effects of tariff reduction and elimination can also be felt when an economy decides to liberalize unilaterally or in the context of free trade agreements, even without joining the ITA. However, reducing or eliminating tariffs within an internationally enforceable agreement such as the ITA provides additional certainty and stability in trade conditions. This "commitment effect" further boosts trade, as elaborated below.

The "commitment effect" of the ITA on imports and exports

Henn and Gnutzmann-Mkrtyan (2015) also demonstrate that the ITA has a non-tariff effect on imports and exports which goes beyond that of tariff reduction and elimination. As ITA participants are required to bind and eliminate duties and other charges on all ITA products in their respective WTO schedules of concessions, the tariff concessions resulting from the ITA become legally binding commitments that are enforceable under the WTO law.

As a result of this process, the liberalization of ITA products is harder to reverse than if it were achieved through unilateral actions and thereby increases trade policy certainty. A consequence of this is that any tariff increase or application of other duties and charges on ITA products, without following the necessary procedures to renegotiate concessions as provided for in the GATT, is then subject to disciplinary actions enforced through the WTO dispute settlement mechanism.

This "commitment effect", and the resulting trade policy certainty, has a further positive impact on trade, as it

can influence investment and entry decisions taken by multinational firms, including through firm location, in favour of ITA participants, thereby increasing their competitiveness and capacity to innovate. Furthermore, membership in an international agreement such as the ITA may, over time, encourage convergence in product standards, which can spur trade and innovation.

The "commitment effect" on imports

Henn and Gnutzmann-Mkrtchyan (2015) show that joining the ITA and binding commitments may spur additional integration of ITA participants, for instance because higher trade policy certainty makes investments in production and distribution networks in ITA participants less risky than in non-ITA participants.

As a result of this "commitment effect", ITA participants tend to increase their imports of all ITA goods by around 6 per cent after acceding to the ITA. According to Henn and Gnutzmann-Mkrtchyan (2015), this effect on imports is particularly relevant for "active" signatories, which have witnessed an increase in their imports of final ITA goods of around 9-10 per cent as a result of their ITA accession, while their intermediate imports have actually decreased (see Figure 1.1).¹³ This may be explained by the fact that "active" signatories, which are often developed economies, tend to outsource the production and assembly of final goods to ITA "passive" signatories, mainly developing economy participants. As a result of this process, "active" signatories' final goods imports increased, whereas "passive" signatories enforced their role in downstream production and export of ITA goods (this is further elaborated in the sub-section below on changing patterns of ITA trade).

The "commitment effect" for exports

The "commitment effect" is also noticeable on exports. Henn and Gnutzmann-Mkrtchyan (2015) suggest that ITA membership may encourage multinational firms to relocate to ITA signatories as the production, assembly, and export of ITA products rely heavily on imports of intermediate goods, such as inputs, parts and components, across different markets in the global value chain. Because ITA participants have liberalized their trade in ITA products and have increased their policy certainty by joining the agreement, multinational firms have an incentive to invest in such economies. This in turn boosts the competitiveness and exports of ITA participants to all economies, regardless of whether they are ITA participants or not.¹⁴

According to Henn and Gnutzmann-Mkrtchyan (2015), the "commitment effect" on exports has impacted differently

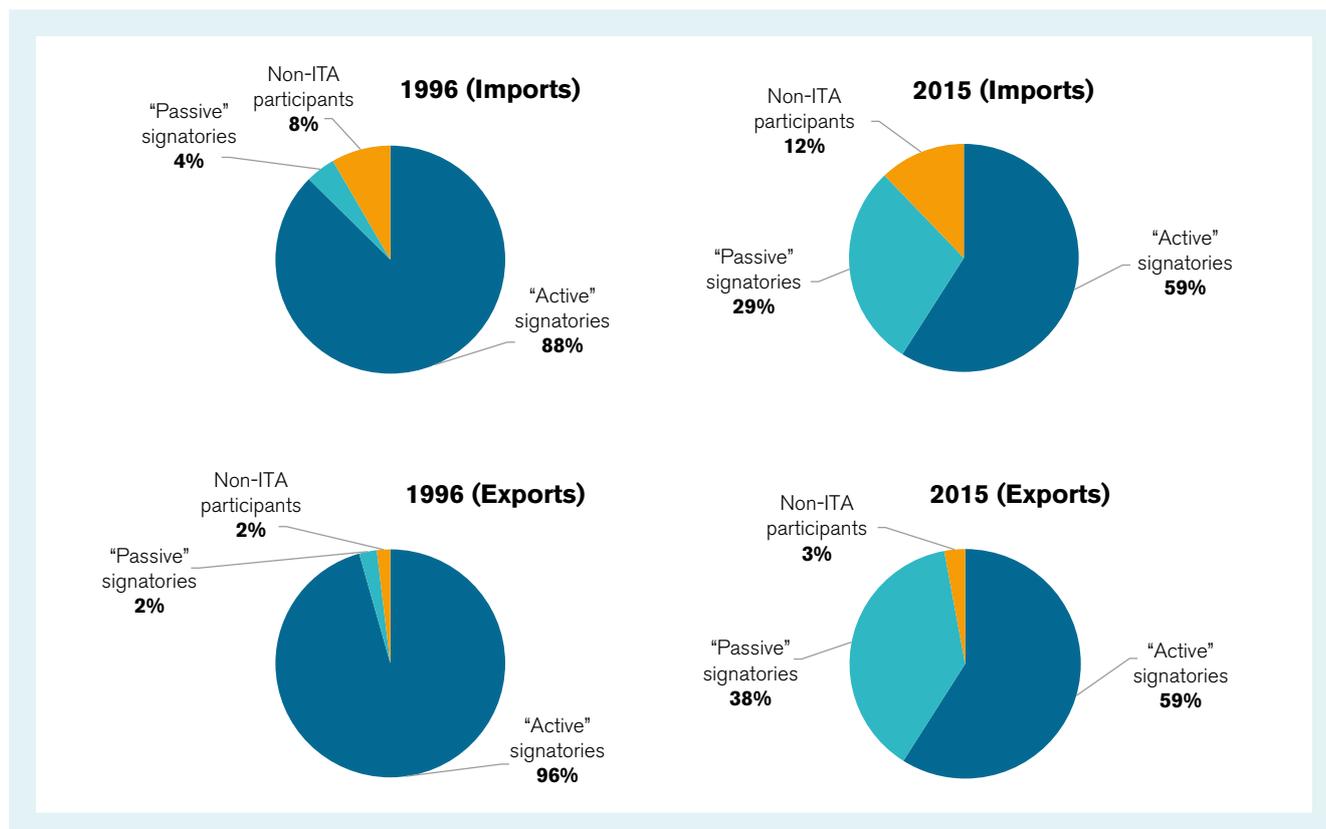
"active" and "passive" signatories. On the export side, "active" ITA signatories are estimated to have experienced a decline of about 7 per cent after accession, mainly due to a decline in their exports of final goods rather than on intermediate goods. This seems to be in line with the value chain literature, which suggests that skills needed for producing intermediate products tend to be higher on average than for assembling final goods. "Active" signatories have thereby increasingly concentrated on export of high-value intermediates and have outsourced the production and exports of final goods to "passive" signatories. This could explain "active" signatories' decrease in exports of final goods. Nevertheless, if one compares ITA export figures with those of other sectors, "active" signatories' ITA exports have performed well after ITA accession, outperforming ICT and machinery exports by 18 and 9 per cent, respectively, across all products.¹⁵

On the other side, "passive" signatories have gained the most from ITA accession through higher exports in absolute terms. Their post-accession ITA exports increased by 36 per cent as a group, although China's outperformance was a major driver of this impact (see Figure 1.1).

Henn and Gnutzmann-Mkrtchyan (2015) note that, since its participation in the ITA, China is no longer simply a downstream assembly hub for ITA products, and that it has substantially increased exports of both intermediate and final ITA products. China is not the only "passive" signatory to have benefited from its accession to the ITA. Other participants, many of them developing or emerging economies, have, as a result of their participation in the ITA, registered absolute gains of 8.5 per cent in final goods exports, and of up to 30 per cent when compared with the broader ICT and machinery sectors.¹⁶ This suggests that ITA membership has facilitated their integration in downstream stages of global value chains via the assembly of intermediate goods and production and export of final goods, as illustrated in the following section.

After 20 years of operation, the ITA has contributed to shifting the trade patterns and market shares of its participants.

Figure 1.1: World market shares in ITA products by type of accession, 1996 and 2015 (per cent)



Source: WTO Secretariat, based on UN Comtrade.

Changing patterns of ITA trade

After 20 years of operation, the ITA has contributed to shifting the trade patterns and market shares of its participants. A remarkable change in ITA trade has been brought about by the emergence of the Asian economies, particularly China, and the growing role of developing economies in global ITA production networks.

A number of other economies with diverse trade and economic profiles joined the ITA after 1997.¹⁷ Among these "late signatories", Henn and Gnutzmann-Mkrtchyan (2015) distinguish two groups: those who decided to join as part of a broader policy objective ("passive signatories") and those who had a different motivation ("active signatories", including ITA founding members). The full list of ITA participants, categorized by the motivations driving their ITA accession, is provided in Table 1.1. When they acceded to the ITA, late signatories had smaller export sectors in ITA goods than original or "active" signatories, and may also have featured a less powerful sector lobby, rendering their drive to join weaker than that of the original signatories.

The importance of "passive" signatories – mainly developing and emerging economies – in the world trade of ITA goods grew rapidly over the period 1996-2015, at the expense of the mainly developed "active" signatories. Notably, Henn and Gnutzmann-Mkrtchyan (2015) show that the market share of "passive" signatories started to increase substantially around the time of their accession to the ITA, and that exports underwent a larger increase than imports. As demonstrated by Henn and Gnutzmann-Mkrtchyan, the global ITA export market share grew in parallel with the sector within "passive" signatories.¹⁸ The share of "passive" signatories' ITA product exports surged and then stabilized at a higher level during the mid-2000s, bringing their share of exports closer to those of "active" signatories, as the ITA product exports of the latter remained stagnant during that period. However, "active" signatories' imports varied little in comparison to their exports. Geographically, import demand for ITA goods has remained fairly stable, while the last decades have seen the origins of products shift, due possibly to location and sourcing choices made by multinational enterprises.

Figure 1.1 shows that if all "passive" signatories are taken together, their share in world exports of ITA products

Table 1.1: ITA participants (82) categorized by the motivations driving their ITA accession

| "Active" ITA signatories, including all founding members (49)* | | |
|--|----------------------------|-----------------------------|
| Australia | India | Poland |
| Austria | Indonesia | Portugal |
| Belgium | Ireland | Qatar (2013) |
| Canada | Israel | Romania |
| Costa Rica | Italy | Singapore |
| Czech Republic | Japan | Slovak Republic |
| Denmark | Republic of Korea | Spain |
| Egypt (2003) | The State of Kuwait (2010) | Sweden |
| El Salvador | Liechtenstein | Switzerland |
| Estonia** | Luxembourg | Chinese Taipei** |
| European Union | Macao, China | Thailand |
| Finland | Malaysia | Turkey |
| France | Mauritius (1999) | United Arab Emirates (2007) |
| Germany | Netherlands | United Kingdom |
| Greece | New Zealand | United States |
| Hong Kong, China | Norway | |
| Iceland | Philippines | |

| "Passive" ITA signatories, whose ITA participation was likely significantly motivated by: | | |
|---|------------------|---------------------------|
| WTO accession (19) | EU accession (5) | US FTA (9) |
| Afghanistan (2014) | Bulgaria (2002) | Kingdom of Bahrain (2003) |
| Albania (1999) | Cyprus (2000) | Colombia (2012) |
| China (2003) | Hungary (2004) | Dominican Republic (2006) |
| Croatia (1999) | Malta (2004) | Guatemala (2005) |
| Georgia (1999) | Slovenia (2000) | Honduras (2005) |
| Jordan (1999) | | Morocco (2003) |
| Kazakhstan (2015) | | Nicaragua (2005) |
| Kyrgyz Republic (1999) | | Panama (1998) |
| Latvia (1999) | | Peru (2008) |
| Lithuania (1999) | | |
| Republic of Moldova (2001) | | |
| Montenegro (2012) | | |
| Oman (2000) | | |
| Russian Federation (2013) | | |
| Kingdom of Saudi Arabia (2005) | | |
| Seychelles (2014) | | |
| Tajikistan (2013) | | |
| Ukraine (2008) | | |
| Viet Nam (2006) | | |

Source: Based on Henn and Gnutzmann-Mkrtchyan (2015). The table has been updated to take into account ITA participants that joined after 2015.

*ITA founding members joined in 1997. Accession year for all non-founding members is given in parentheses.

**Among ITA founding members, Estonia and Chinese Taipei were the only ones which joined the WTO subsequently (in 1999 and 2002, respectively). They had ITA membership as a requirement in their WTO accession protocols and are classified as "active" signatories because they were founding members and acceded before their WTO accession.

has increased by 36 percentage points as a result of their ITA membership, although China's outperformance, if considered separately, made up a share of 33 per cent of ITA exports in 2015. As mentioned above, this is mainly due to the fact that China has become more than a mere downstream assembly hub for ITA products since its ITA accession, by exporting in addition to final goods substantially more ITA intermediate products. Nevertheless, at the more disaggregate level, other "passive" signatories have also gained by their accession to the ITA, particularly with respect to exports of final ITA goods, in which they have registered absolute gains of about 8.5 per cent thanks to their accession. If compared to the ICT and manufacturing sectors, ITA accession even occasioned a rise of about 30 per cent in final goods exports in "passive" signatories. Meanwhile, "passive" signatories did not record significant export gains in intermediate goods, which seem to suggest that ITA membership has helped them enforce their role in downstream stages of global ITA value chains. As noted by Henn and Gnutzmann-Mkrtchyan (2015), this is in line with the literature on value chains which indeed suggests that for initial entrants, it is most common to join global value chains in downstream activities where the skills to perform those tasks can be acquired more easily.

B. Opportunities and challenges of implementing the ITA

The ITA is not merely a trade liberalization agreement. Its positive impacts on trade and the economic performance of its participants were reviewed in the preceding sections. Henn and Gnutzmann-Mkrtchyan (2015) have shown that the ITA has had a positive effect on imports through tariff reduction and elimination, including the facilitation of cross-border trade. In addition, undertaking liberalization commitments under the ITA contributes to increased trade policy certainty and can encourage multinational firms to invest in participating economies. Moreover, Henn and Gnutzmann-Mkrtchyan find that the "commitment" effect has an impact on exports, and particularly those of developing economy participants, the possible reasons for this being the relocation of production processes to ITA participants, including because of their attractiveness for multinational firms, which is key in highly integrated sectors such as the ITA sector and allows developing economies to become more competitive and actively participate in global value chains.

By reducing barriers, the ITA can play an enabling role in technology diffusion and innovation.

At the same time, as Henn and Gnutzmann-Mkrtchyan point out, it is important to note that all participants have not benefitted equally from trade liberalization under the ITA. Gains from trade liberalization may be counterbalanced by costs due to certain specificities of each economy, such as geographical remoteness, levels of education, the business environment and institutions. The results of tariff liberalization and market opening may negatively affect the domestic industry if it is not ready to adapt to changing technology requirements and compete with increased imports, which are central in this type of industry. According to these studies, economies that lag behind major trading partners in the ICT sector need to undertake regulatory reforms and support policies in order to reduce the gap in costs and capabilities, and domestic policies aimed at unblocking barriers to investment and growth are necessary to boost ICT manufacturing and innovation, enhance productivity and contribute to welfare.

By reducing the barriers to access the ICT sector, the ITA can play an enabling role in technology diffusion and innovation. In the right circumstances, it can ultimately allow broader penetration of developing economies into global production networks and spur innovation in other sectors, thereby benefitting the economy as a whole.¹⁹ The results of a survey conducted by the International Trade Centre (ITC) summarized in Annex 1.1 provide an illustration of the challenges faced by some developing economy SMEs. These results provide one perspective and look only at the impact of the ITA on SME competitiveness in the ICT sector of the economies surveyed. Moreover, the case study of Guatemala (Box 1.1) is an example of how some of these challenges can be addressed.

BOX 1.1 Guatemala's participation in the ITA contributed to empowering young people in rural areas

Since 2005 the Guatemalan ICT sector has been expanding because of the increasing availability of information technology goods and services. Guatemala's participation in the ITA, as well as other regional and bilateral trade agreements, has contributed to setting up the technological infrastructure required to jump-start the ICT sector and make technology accessible in urban and rural areas, thereby providing new opportunities for young people.

The Guatemalan ICT sector has created more than 30,000 jobs, and an additional 31,500 posts are expected in the near future. Employment in the ICT sector has helped to mitigate the negative effects of the informal economy, which, in rural areas in particular, has reached 82.5 per cent of the total economy, by generating high-profile jobs to supply the formal IT workforce. A study by the Inter-American Development Bank (IDB) suggests that software development is fast becoming one of the most in-demand professions in Latin America. It is estimated that there will be 1.2 million active developers by 2025 and that the industry will become the driving force behind progress in the region, including in Guatemala.

In recent years, Guatemala has seen the installation of many international IT companies, which have preferred Guatemala because of advantages such as its participation in international trade agreements like the ITA, its geographical location, time zones, and its competitive labour costs. World-renowned IT companies that have invested in Guatemala include FOX International, Walmart.com, Medicare, AUTOBYTEL, Orange, Workwave, Healthcare.com and XOOM by Paypal.

However, difficulties have arisen for IT companies in finding sufficient qualified talent to match their job demands. On the other hand, the young population is not aware of the opportunities offered by the ICT sector. To overcome this problem, Guatemala has put in place training and placement programmes such as "Programa Valentina" by the Fundación Sergio Paiz Andrade (FUNSEPA),²⁰ which are helping change this trend by creating a pool of qualified workers to bolster the IT sector. The programme, which was initiated in a small rural town in Guatemala, has now secured funds to start five new training projects in other rural areas to match the requirements of the IT sector. Thanks to this initiative, young trainees will be able to enter the formal job market and earn salaries that are two or three times higher than the minimum wage in Guatemala.

Through these programmes, Guatemala is expected to leverage the favourable economic conditions created by trade liberalization initiatives like the ITA to work towards meeting the targets set by the UN Sustainable Development Goals, including Goal 4 on quality education, Goal 8 on decent work and economic growth, and Goal 9 on industry, innovation and infrastructure. Access to a better and wider variety of technology products is a necessity if Guatemala is to develop its IT industry's capacity to compete globally.

Annex 1.1: ITC survey on the impact of the ITA on SMEs competitiveness in the ICT sector

The International Trade Centre (ITC), a joint technical agency of the United Nations and the WTO specialized in Aid for Trade, conducted a survey about the effects of joining the ITA on the competitiveness of SMEs active in the IT and business process outsourcing (BPO) sectors of six economies – Bangladesh, Kenya, Mauritius, the Philippines, Senegal and Viet Nam. In order to operate in the IT and BPO industries, a company requires skilled human resources, office space, IT hardware and internet connectivity. IT hardware plays a substantial role in the cost base of SMEs active in the sector.

The survey conducted by ITC was directed at relevant industry associations and a sample of IT companies within certain ITA participants and non-participants. The selection of economies took into account the 2016 A.T. Kearney Global Services Location Index,²¹ which examines the offshoring supply side in 55 economies, and the ITC's networks in developing economies.

ITA participants selected to take part in the survey included:

- The Philippines (ranked seventh), which joined the ITA in 1997 and has fully implemented zero tariffs since 2005;
- Mauritius (ranked 30th), which joined the ITA in 1999 and has fully implemented zero tariffs since 2005; and
- Viet Nam (ranked 11th), which joined the ITA in 2006 and has fully implemented zero tariffs since 2014.

The Information Technology and Business Process Association of the Philippines (IBPAP), the Vietnam Software Association (VINASA), and the Outsourcing and Telecommunications Association of Mauritius (OTAM) were contacted for the survey. However, VINASA and IBPAP did not reply to the survey.

Non-ITA participants selected for the survey include:

- Bangladesh (ranked 22nd) – the Bangladesh Association of Software and Information

Services (BASIS) and some of their members answered the survey;

- Kenya (ranked 39th) – Kenya IT and Outsourcing Service (KITOS) and some of their members answered the survey; and
- Senegal (ranked 45th) – l'Organisation des Professionnels des TIC du Sénégal (OPTIC) answered the survey;

Four products that form part of the basic equipment for IT companies were also selected in order to compare tariffs across ITA participants and non-participants, namely: personal computers, local area network cables, network switches and servers. An overview of the MFN applied tariffs and preferential duties on selected products (at the Harmonized System six-digit level) and economies is provided in Annex Table 1.1.

Responses to the ITC survey

Asked about the ITA's impact on the IT and BPO industries in Mauritius, OTAM indicated that they fully support the decision of the Government of Mauritius to join in the ITA and appreciate the fact that most ICT-related imports are exempt from customs duties and taxes. OTAM believes that the results of the ITA are beneficial for IT and BPO companies "since it will help to cut the capital expenditure and they can concentrate on operating expenses".

In the case of Bangladesh (which is a non-participant to the ITA), BASIS explained that, while its board and secretariat have a general understanding of the ITA, its members were not aware of the agreement, leaving BASIS in the difficult position of issuing a statement on behalf of the Bangladeshi IT and BPO sectors. BASIS suggested that workshops and training programmes could be arranged with the joint collaboration of relevant organizations such as the WTO and ITC on the subject of the ITA, its main provisions and applicability, expected benefits, and legal implications and required legislative changes.

Annex Table 1.1: MFN applied tariffs and preferential duties on selected products

| | Kenya | Bangladesh | Senegal | India | Philippines | Mauritius | Viet Nam |
|--|---|--------------------------------|-------------------------------|---|--------------------------|--------------------------|------------------------------|
| 2016 A.T. Kearney Global Services Location Index Ranking | 39 | 22 | 45 | 1 | 7 | 30 | 11 |
| ITEM (HS code) | Rate of duty | | | | | | |
| Personal computers HS 8471.30 | MFN duty (applied) 0% | MFN duty (applied) 2.00% | MFN duty (applied) 5.00% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% |
| | | PT for SAFTA economies 0% | PT for ECOWAS economies 0% | | | | Non-MFN duty (applied) 0% |
| Local area network cable HS 8544.42 | MFN duty (applied) 25.00% | MFN duty (applied) 25.00% | MFN duty (applied) 20.00% | MFN duty (applied) 7.50% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% |
| | PT for EAC economies 0% | | PT for ECOWAS economies 0% | PT for LDCs, SAFTA (LDCs), Bhutan, Singapore, Sri Lanka 0% | | | Non-MFN duty (applied) 0% |
| | PT for COMESA economies not members of the FTA 2.50% | | | | | | |
| | PT for COMESA economies not members of the FTA 2.50% | | | | | | |
| Network Switch HS 8517.62 | MFN duty (applied) 0% | MFN duty (applied) 5.00% | MFN duty (applied) 10.00% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% |
| | | PT for APTA economies 4.50% | PT for ECOWAS economies 0% | | | | |
| Server HS 8471.70 | MFN duty (applied) 0% | MFN duty (applied) 2.00% | MFN duty (applied) 5.00% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% | MFN duty (applied) 0% |
| | | PT for SAFTA economies 0% | PT for SAFTA economies 0% | | | | Non-MFN duty (applied) 0% |

Source: Market Access Map, 2017 (accessible at: <http://www.macmap.org>).

APTA: Asia-Pacific Trade Agreement.

EAC: East African Community.

ECOWAS: Economic Community of West African States.

LDC: least-developed country.

MFN: most-favoured-nation basis, i.e. equal treatment for all members of the WTO.

PT: preferential tariff.

SAFTA: South Asian Free Trade Area.

BASIS considered that the statutory rate of import duty should be diminished to zero as early as possible with a view to keeping the IT and BPO industries growing.

Similarly to Bangladesh, the majority of KITOS members in Kenya did know of the ITA at the time of the survey. Members interviewed by the KITOS Secretariat felt that "the current tariffs imposed on ICT products were unreasonable, especially because nearly all ICT products were imported making them expensive both for business and consumers". KITOS members wanted the government to look at ways to reduce or remove tariffs. In their view, the sector would grow and potential investors would be confident about it if tariffs were reduced. In addition, KITOS noted in the survey that "since the world is moving toward a cashless society, reducing/removing these tariffs will allow larger and smaller business owners to buy equipment that can facilitate their business and eventually affect the growth of the economy". According to KITOS, this would also result in increased access to ICT products and services for consumers, as prices would decrease. KITOS recognized that that Kenya's participation in the East African Community might affect its capacity to join the ITA. As in the case of Bangladesh, KITOS members shared the view that there was a need for seminars/workshops for the public and private sectors so that they might gain a better understanding of the advantages of joining the ITA and how this would affect the Kenyan economy as a whole.

OPTIC from Senegal was aware of the ITA and some of its members expressed concerns about applied tariffs and taxes, notably on imports of hardware by customs. Some OPTIC members also highlighted that there was a lack of understanding of the different types of hardware, which had resulted in the misclassification of such products for customs purpose and, consequently, in an inconsistent application of import tariffs.

In parallel with the email survey, which targeted business associations, the ITC conducted face-to-face interviews with Bangladeshi and Kenyan SMEs active in the IT and BPO industries.²² Responses to the interviews showed that while current tariff and taxes on hardware might have a potential adverse effect on their competitiveness, other key factors can act as barriers to the work of SMEs. In fact, the companies interviewed were of the opinion that applied tariffs had been reduced substantially over the recent years and that this had had a positive impact on their competitiveness. However, other types of barriers remained.

Digital Vision, a software development company from Kenya, indicated for instance that while the Government of Kenya generally sought to create a favourable business environment, Digital Vision continued to face challenges with respect to the availability of human resources with the right skill sets, access to credit, competition from foreign suppliers in a very open domestic market, and the enforcement of intellectual property rights. Green Bell, another Kenyan IT company, indicated that their main challenge was finding highly skilled, specialized human resources. Compliance with standards and non-tariff measures were other barriers to entering the global market that they cited.

Systech Digital, a software development company from Bangladesh, also pointed to the issues of availability of highly skilled professionals, although the cost of hardware was not perceived as an issue for them. LeadSoft, another Bangladeshi IT company, viewed current hardware prices as competitive and pointed out that computer equipment was written off over a period of three years and constituted a small share of the costs covered by the company. The main obstacles for them were an insufficiency of talented workers, costly real estate, problems with connectivity and power supply shortfalls.

The ITC survey concluded by showing that companies in both ITA participants and non-participants recognized the benefits of lowering or eliminating import tariffs and other taxes on IT products and inputs, as this affected the competitiveness of SMEs and could contribute to more affordable access to IT products for consumers. As noted by the industry associations interviewed, the decision to apply zero duties on imports of IT hardware represents a key factor in SMEs' competitiveness in economies where no or little hardware production takes place. However, besides tariff liberalization, SMEs face other major challenges in their day-to-day operations which should be addressed in order to make them competitive and able to grasp the opportunities arising from the fast-growing IT sector.

Endnotes

- 1 Ministerial Declaration on Trade in Information Technology Products, official WTO document no. WT/MIN(96)/16, para 1.
- 2 Throughout this publication, the terms "ITA" goods or products refer only to products covered by the 1996 Ministerial Declaration, as defined in its annexes. For the purpose of this chapter, it should be noted that there is no WTO definition for ICT sector or goods. According to Henn and Gnutzmann-Mkrtchyan (2015), the OECD provides a definition of ICT goods, which covers a total of 193 products at the 6-digit level of the 1996 version of the Harmonized System (HS) nomenclature. However, not all the products covered by the ITA are included in the OECD definition of ICT goods and vice versa. Therefore, the terms ITA and ICT do not cover the same products and are not interchangeable.
- 3 Henn and Gnutzmann-Mkrtchyan (2015).
- 4 For a review of the existing literature, see Henn and Gnutzmann-Mkrtchyan (2015), page 33.
- 5 See for instance Ernst (2013) and Ernst (2014).
- 6 See Henn and Gnutzmann-Mkrtchyan (2015), pages 2-3.
- 7 "Passive" signatories include some economies that acceded to the WTO after 1997 and that made a commitment to join the ITA in their accession protocols. Acceding members of the European Union also had to adopt the trade policy of the European Union either upon accession or in the preparatory process, and hence joined the ITA, unless they had already acceded to it before. In other cases, economies engaging in FTAs with the United States were requested to join the ITA. See Henn and Gnutzmann-Mkrtchyan (2015), page 5.
- 8 The definition of intermediate and final goods is based on the United Nations Classification by the Broad Economic Categories (BEC). More information on the data used by the authors can be found in Henn and Gnutzmann-Mkrtchyan (2015) pages 9-11.
- 9 The authors point out that the tariff elasticity values provided in their working paper are lower than most import demand elasticities reported in the literature and are derived based on total trade, which also includes many homogeneous products. For instance, Kee et al. (2008) and Tokarick (2014), cited on page 19 of Henn and Gnutzmann-Mkrtchyan (2015), estimate such elasticities for many different economies and come up with averages in the range of -1.1 to -1.2.
- 10 See Chapter 5.
- 11 See references to the emerging time in trade literature in Henn and Gnutzmann-Mkrtchyan (2015), page 3.
- 12 More information on the tariff profiles of ITA participants is provided in Chapter 2 and Chapter 3 of WTO (2012).
- 13 Henn and Gnutzmann-Mkrtchyan (2015), page 21.
- 14 Henn and Gnutzmann-Mkrtchyan (2015), pages 3-4.
- 15 Ibid.
- 16 WTO (2014) offers an overview of the literature on value chains, from which it can be concluded that initial entrants generally join in downstream activities, given that it is easiest to acquire the capabilities needed to perform those tasks (Henn and Gnutzmann-Mkrtchyan, 2015, page 22).
- 17 For the full list of ITA participants with respective dates of accession, see page 91.
- 18 Henn and Gnutzmann-Mkrtchyan (2015), page 9.
- 19 See Chapter 5.
- 20 <http://funsepa.org>.
- 21 The 2016 A.T. Kearney Global Services Location Index can be accessed at: <https://www.atkearney.com/strategic-it/global-services-location-index>
- 22 The ITC survey also included two companies from Uganda. One of these, Trace Node, a software development company, also pointed to the barriers to access to the global market and the high costs of compliance with standards. They indicated that their lack of payment methods for services such as mobile money affected their competitiveness compared to other economies such as Kenya. The other company, Data Care, which is active in ITO industry, also emphasized the high costs of compliance with standards as well as general shortfalls in infrastructure, including problems of connectivity.

Chapter 2

- *Between 1996 and 2015, ITA world exports more than tripled, reaching US\$ 1.7 trillion and representing 15 per cent of total world manufactures exports, exceeding shares of automotive products, textiles and clothing, and pharmaceuticals.*
- *World ITA imports have grown at an annual rate of 7 per cent, passing from US\$ 550 billion in 1996 to US\$ 1.8 trillion in 2015, which is slightly faster than total world imports (+ 6 per cent per year).*
- *Developing economies' share in world exports of ITA products increased from 26 per cent in 1996 to 63 per cent in 2015, mainly driven by the performance of Asian economies. In 2015, seven of the top ten exporters of ITA products were Asian economies.*
- *Developing economies' share in world imports of ITA products increased to 51 per cent in 2015. This is largely linked to the specialization of tasks and reliance on ICT global value chains.*

Key statistics and trends in ITA trade

This chapter provides an overview of tariffs and trade under the ITA for the period 1996 to 2015. For tariffs, the chapter focuses on profiles of members that joined the ITA from 2012 onwards, as there were no changes in the tariff structure of ITA participants that joined previous to 2012.¹ The vast majority of ITA participants have in fact completed the tariff phase-out periods and entirely removed import duties and other duties and charges on all covered products.² The most recent trends in ITA tariffs and trade for those WTO members that are key players in the sector but have not joined the agreement (hereafter called “non-participants”) have also been included in this chapter.

The statistical analysis in this chapter is based on a number of methodological assumptions which are described in the Appendix.

Given the importance of trade in intermediate goods, this chapter also presents the “Trade in Value Added” (TiVA) statistical approach as a tool to analyse transactions taking place within global value chains (GVCs) in ITA-related industries. It also provides an overview of how ITA participants are performing in GVCs and what their level of integration is.

A. Tariff profile of new ITA participants

The ITA includes 82 WTO members today. The vast majority of them have already completed their tariff elimination commitments on all ITA products. Since the 15th anniversary of the ITA in 2012, seven WTO members have joined the ITA. These are Afghanistan, Kazakhstan, Qatar, the Russian Federation, Montenegro, Seychelles and Tajikistan.³ With the exception of Qatar, the rest joined the ITA as part of their WTO accession process and agreed to bind and eliminate duties on all products covered by the ITA. In general, the initial tariff commitments of members that join the ITA as part of their accession process were more liberal than those of other participants, and in most cases these commitments were implemented upon accession. In other cases, additional time was needed to complete the domestic procedures

or the formal process of modifying the WTO schedule of concessions in order to have full participant status.⁴

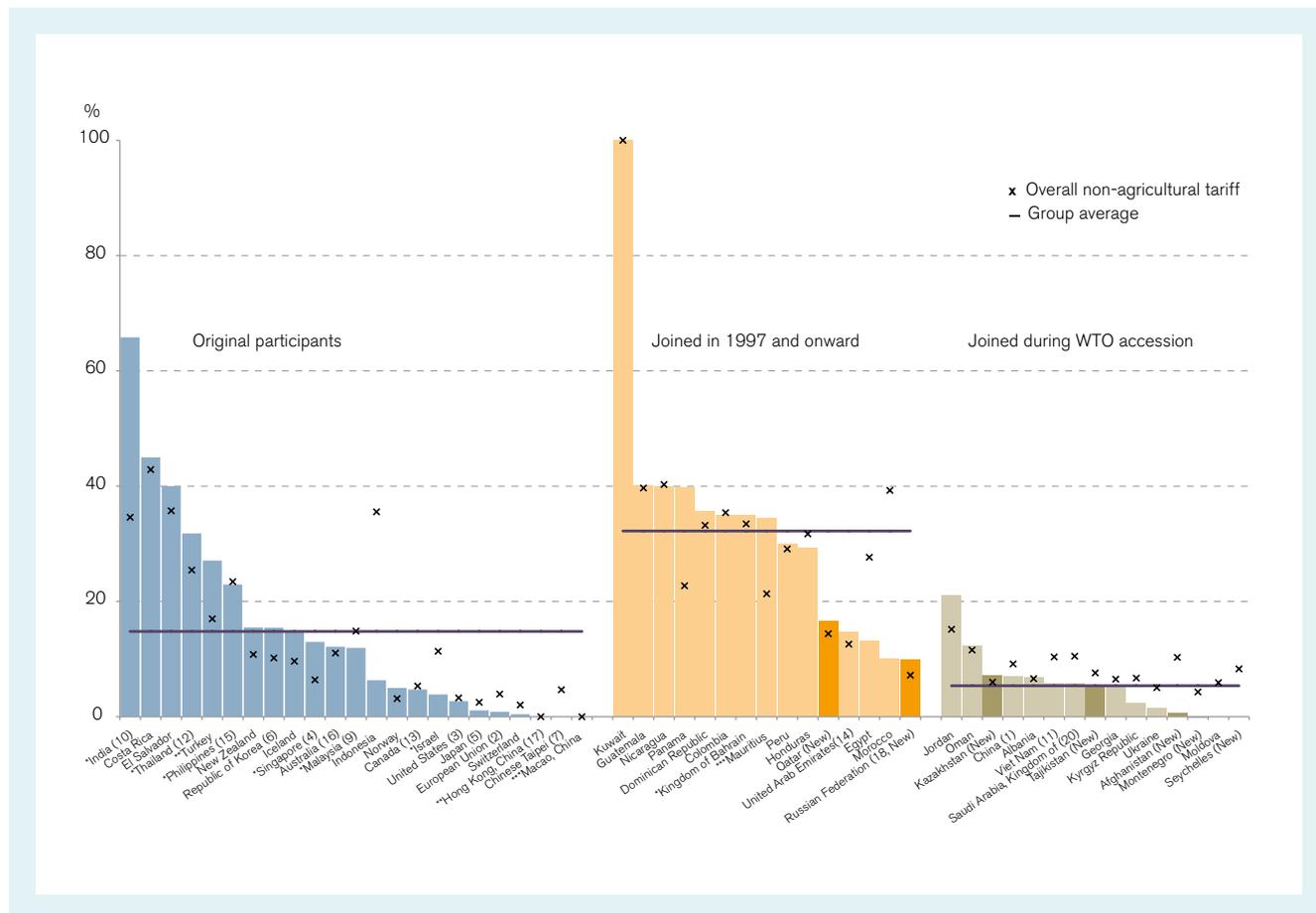
Figure 2.1 shows the average initial bound tariffs on ITA products (i.e. the starting point for tariff reduction) and compares it with the average bound tariff on non-agricultural products for all ITA participants divided in three categories (“original” participants, or participants in the ITA prior to 1997; members that joined in 1997 or after; and members that joined as part of their accession to the WTO). As indicated, members that joined the ITA as part of their accession process to the WTO (showed in green in the figure) generally have more liberal base commitments as compared to other participants.

The only new participant of the seven that has been a WTO member since January 1996 is Qatar. Qatar is a member of the Gulf Cooperation Council (GCC) and applies the GCC Common External Tariff (CET). Its bound tariffs on ITA products at the time of accession averaged 16.5 per cent and were the highest among recent participants. The other five members of the GCC are also participants in the ITA, hence the GCC CET takes into account their respective ITA commitments.

The Russian Federation joined the WTO in August 2012 and agreed to participate in the ITA as part of its accession negotiations. However, the process of modification and approval of its ITA schedule took time and the Russian Federation did not become a full participant in the ITA until September 2013. The Russian Federation is a member the Eurasian Customs Union (EACU), to which Kazakhstan also belongs. Kazakhstan joined both the WTO and the ITA in 2015, and implemented its ITA commitments upon accession. Upon joining, the Russian Federation’s and Kazakhstan’s base duties on products covered by the ITA were less than 10 per cent.

Afghanistan, Montenegro and Seychelles are the newest ITA participants that have the lowest bound duties on ITA products, at less than 1 per cent. Seychelles provided duty-free treatment for all ITA products during its accession year.

Figure 2.1: Overall average bound tariffs on non-agricultural products and average initial bound tariffs on ITA products



Source: WTO Integrated Data Base (IDB) and Consolidated Tariff Schedules database (CTS).

Note: Asterisk/s before the name of the economy indicates less than 85 per cent binding coverage for non-agricultural products: *** < 35%; ** 35% - 60%; * 60% - 85%. Darker shade within each group refers to recent (i.e. new) participants. Rank as top 20 importers in 2015 is indicated in parentheses. "New" refers to participants that joined in or mid-2012.

B. Tariff profile of non-ITA participants

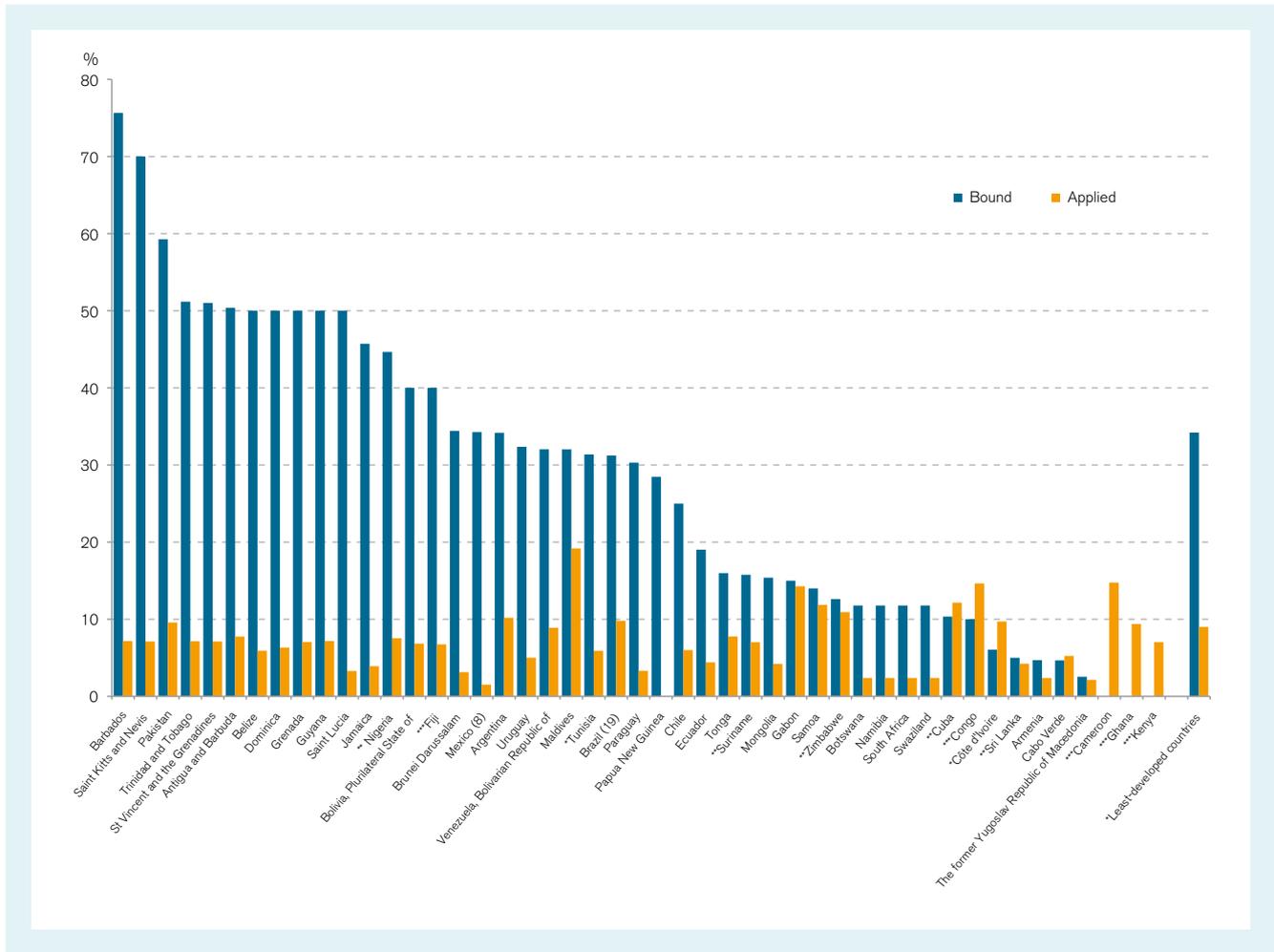
Tariffs applied by non-participants on ITA products remain generally high. Their level of tariff concessions on ITA products has not recorded significant changes. This is true both for the level of bound tariffs and the binding coverage (i.e. the percentage of tariff lines inscribed in the schedule with a bound duty). The difference between applied and bound duties on ITA products by non-ITA participants is shown in Figure 2.2. As can be seen, the situation among non-participants varies considerably with the majority of non-ITA participants with bound duties that are much higher than their applied rates.

Mexico and Brazil stand out as the two non-participants in the top 30 ITA importers; they rank 8th and 19th

Tariffs applied by non-participants on ITA products remain generally high.

respectively in 2015 (see Annex Table 2.1). These two members have full tariff bindings on ITA products but the level of their bound duties remains high compared to their applied rates. Therefore, the “binding overhang”, that is, the difference between the duties actually applied by a member and the maximum bound rates recorded in its WTO schedule of concessions, remains high.

Figure 2.2: Bound and latest applied tariffs of non-ITA participants



Source: WTO, IDB and CTS databases.

Note: Asterisk/s before the country name indicates less than 90 per cent binding coverage for ITA products. *** <10%; ** 10% - 50%; * 50% - 90%.

For example, in 2016 Mexico’s applied MFN tariff on ITA products remained at 1.5 per cent, which is almost the same level as in 2010, hence its binding overhang persists at around 33 per cent. Similarly, Brazil’s 2016 average applied MFN tariff of 10 per cent has decreased by more than 1 percentage point as compared to 2010, thus its binding overhang has reached 21 per cent. Figure 2.2 also shows that high binding overhang is a common feature of most non-participants.

Among non-participants, the member with full binding coverage and lowest bound duty (3 per cent) for ITA products is the former Yugoslav Republic of Macedonia. On applied tariffs, Papua New Guinea provides duty-free treatment to ITA imports ; however, its corresponding bound duties on ITA products are as high as 28 per cent. On the other end, Djibouti, which is a least-developed

country (LDC), had the highest applied tariff of all non-participants at 21 per cent in 2014, followed by Maldives, which graduated from LDC status in 2011 and whose most recent applied tariff stood at 19 per cent.

With respect to binding coverage of ITA products, there are 10 non-participants – of which seven (Burundi, Chad, Gambia, Mozambique, Myanmar, Tanzania and Togo) are LDCs and three (Cameroon, Ghana and Kenya) are non-LDCs – that are fully unbound, meaning that they have no scheduled commitments on tariff lines covered by the ITA.

More generally, average binding coverage for non-participants that are not LDCs is 80 per cent, with an average bound duty of 30 per cent, whereas average applied rates remain at around 7 per cent, which is mostly unchanged from the corresponding level of five years ago.

Table 2.1 shows the distribution of the most recent MFN applied tariffs for all non-participants, including LDCs. While only one member has no duties on imports of ITA products and a quarter of them impose relatively low duties (5 per cent or less), 17 members impose fairly high tariffs at more than 10 per cent. The vast majority of non-participants apply duties ranging between 5 and 10 per cent.

Table 2.1: Frequency distribution of the latest average MFN applied tariffs on ITA products for non participants

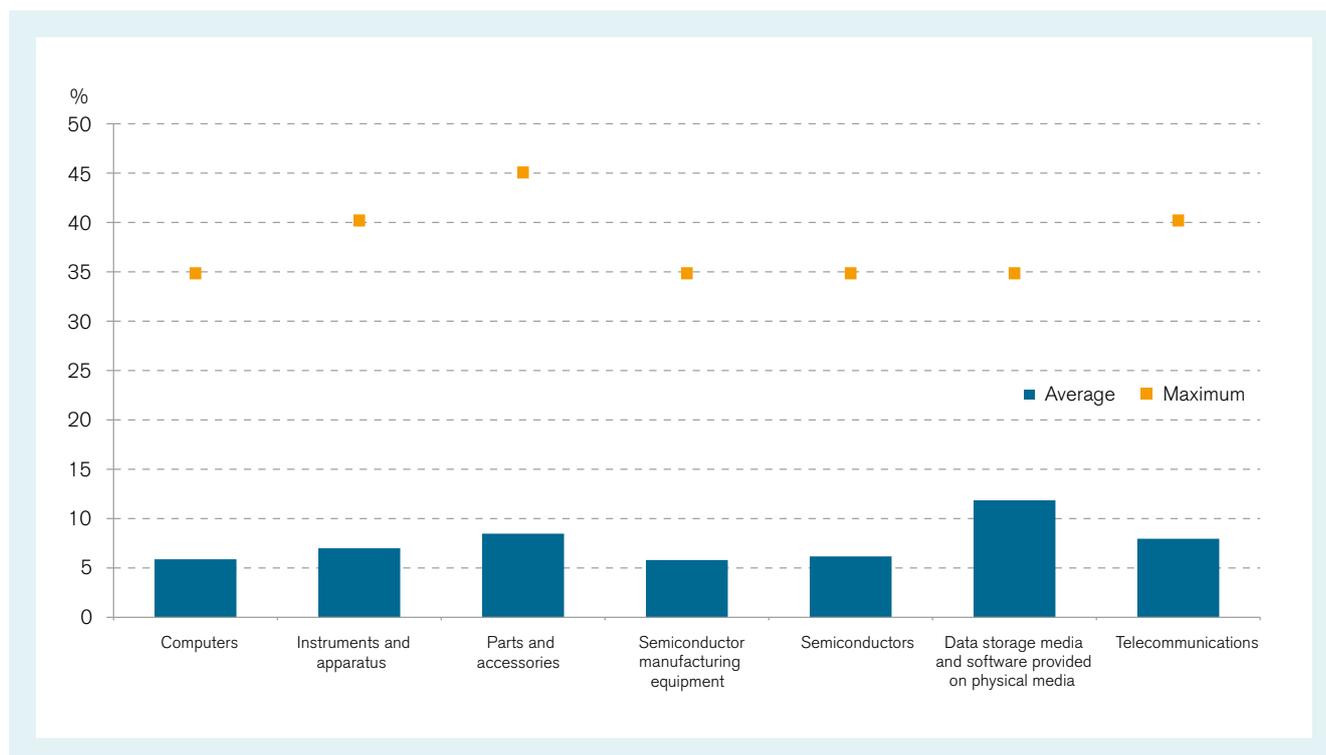
| MFN applied duty range on ITA products | Number of non-participants, including LDCs |
|--|--|
| Duty free | 1 |
| Dutiable – less than or equal to 5% | 19 |
| 5% - 10% | 45 |
| 10% - 15% | 14 |
| Greater than 15% | 3 |

Source: WTO IDB.

Between 1996 and 2015, world exports of ITA products increased from US\$ 549 billion in 1996 to US\$ 1,653 billion in 2015.

Figure 2.3 gives an overview of the average and maximum applied duties by non-participants on the different broad product categories covered by the ITA.⁵ The product category with the highest duty, at 12 per cent, is "data storage media and software provided on physical media". However, in some cases tariffs applied at the product or tariff line level can be as high as 45 per cent. This is the case in the category of "Parts and accessories" for which in some non-participants a duty of up to 45 per cent is applied on imports of audio frequency electric amplifiers (HS 851840).

Figure 2.3: Average and maximum applied tariff on ITA products for non-participants, by product category



Source: WTO IDB.

C. Trade flows: ITA exports more than tripled in spite of falling prices

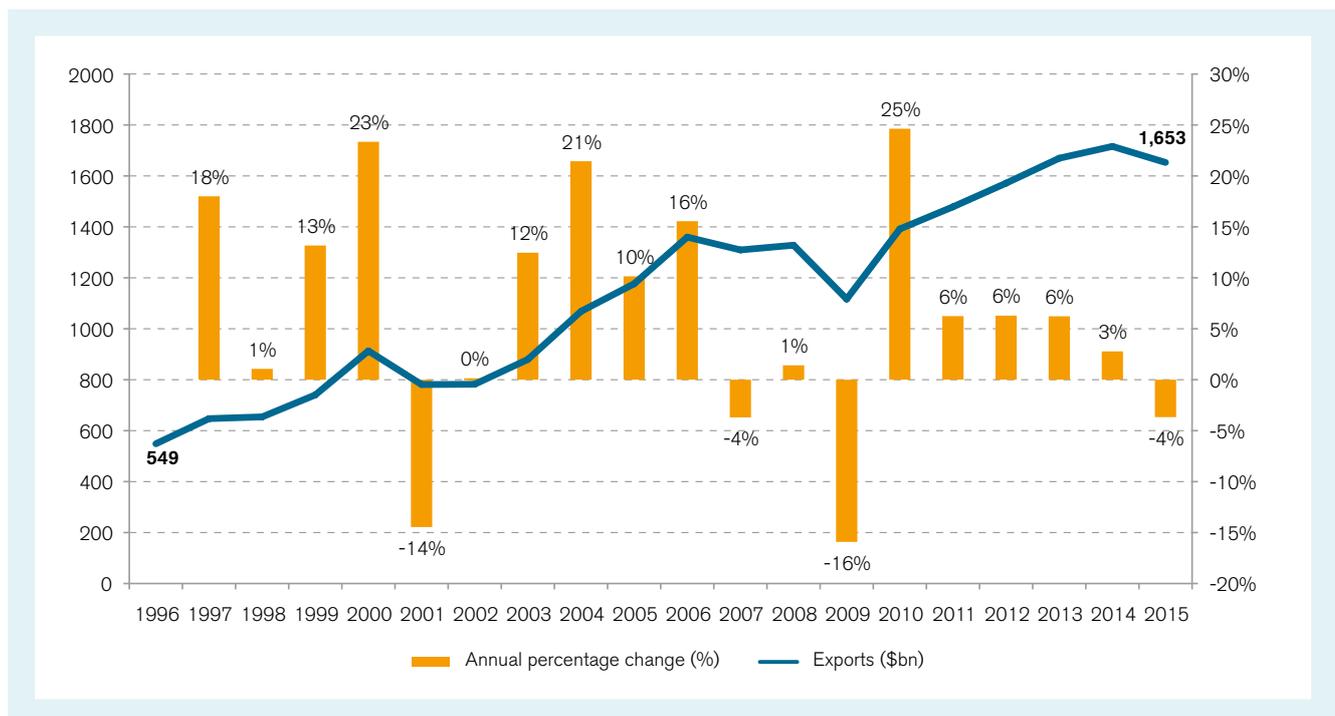
Between 1996 and 2015, world exports of ITA products increased from US\$ 549 billion in 1996 to US\$ 1,653 billion in 2015 (see Figure 2.4). This represents an average annual increase of 6 per cent during this period. The highest annual percentage change (+25 per cent) was observed in 2010 – a sort of base effect after the strong decline (-16 per cent) of the crisis year 2009. During 2011 to 2013, the growth rate of ITA exports was rather constant at 6 per cent per year, followed by 3 per cent in 2014 and a decline of 4 per cent during the most recent year studied, 2015.

In 2015, world exports of ITA products reached a share of 15 per cent in total manufactures exports, up from 11 per cent in 1996 (see Figure 2.5).⁶ This exceeds the respective shares of other important product categories in 2015 such as automotive products (12 per cent), textiles and clothing (7 per cent) and pharmaceuticals (5 per cent). The development of the share of ITA products during 1996-2015 was, however, not straightforward; while there was a constant increase in terms of share between 1996 and the peak-year 2000 (an increase of 20 per cent), development in the years after 2000 was characterized by a tendency to stagnate or even decrease.

In 2015, world exports of ITA products reached a share of 15 per cent in total manufactures exports, up from 11 per cent in 1996.

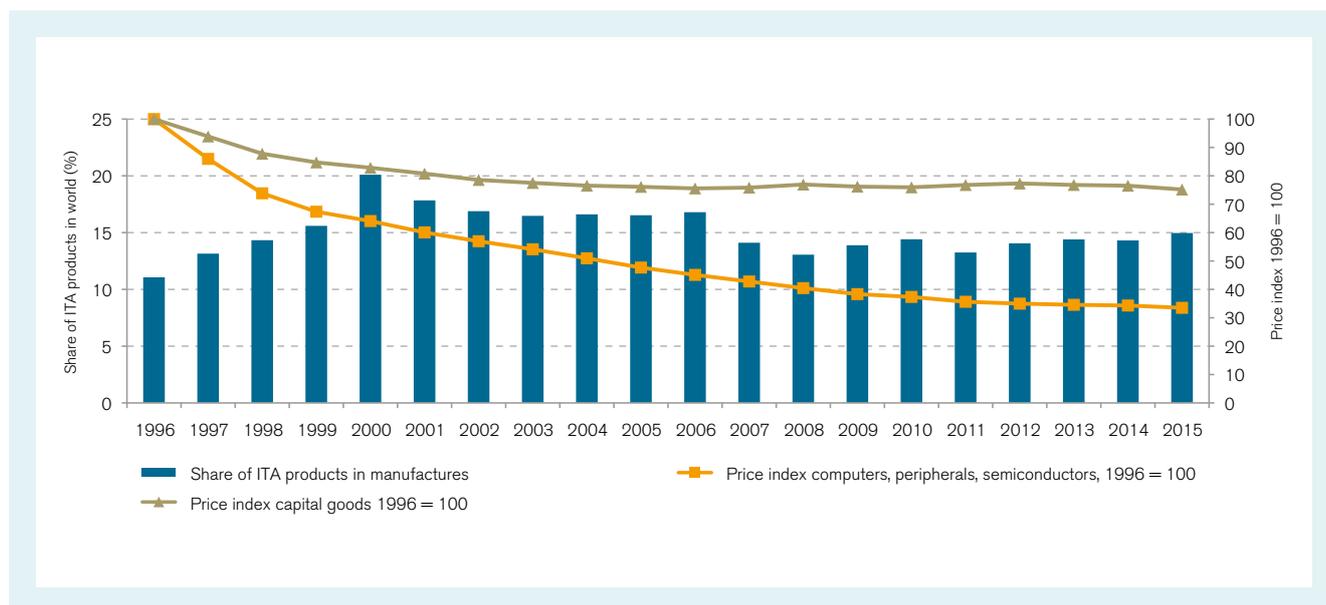
These shares have remained remarkably high, despite considerable decreases in the prices of some of the main ITA product categories. The US Bureau of Labor Statistics estimated the import price level in 2015 for the category “computers, peripherals and semiconductors” to be around 66 per cent below the respective level of 1996, while the average import prices for capital goods in total were only about 25 per cent below the level 1996. Therefore, and as a result of significant price reductions and increased performance, consumers and producers importing IT products as inputs to their industry have benefited from an unprecedented reduction in the price paid for computational power.

Figure 2.4: World exports of ITA products, 1996-2015
(billion US\$ and percentage change)



Source: WTO Secretariat, based on UN Comtrade.

Figure 2.5: Share of ITA products in world exports of manufactures and price index of US imports of capital goods and of computers, peripherals and semiconductors, 1996-2015 (percentage share)



Source: WTO Secretariat, based on UN Comtrade, WTO estimates and US Bureau of Labor Statistics.

D. Leading exporters of ITA products

Developing economies' share in world exports of ITA products more than doubled in the past 20 years, increasing from 26 per cent in 1996 to 63 per cent in 2015. This is higher than their share in world total exports, which grew from 27 per cent to 43 per cent in the same period. Asia's share increased sharply in the period, rising from 44 per cent of global exports of ITA products in 1996 to 70 per cent in 2015 (see Figure 2.6).

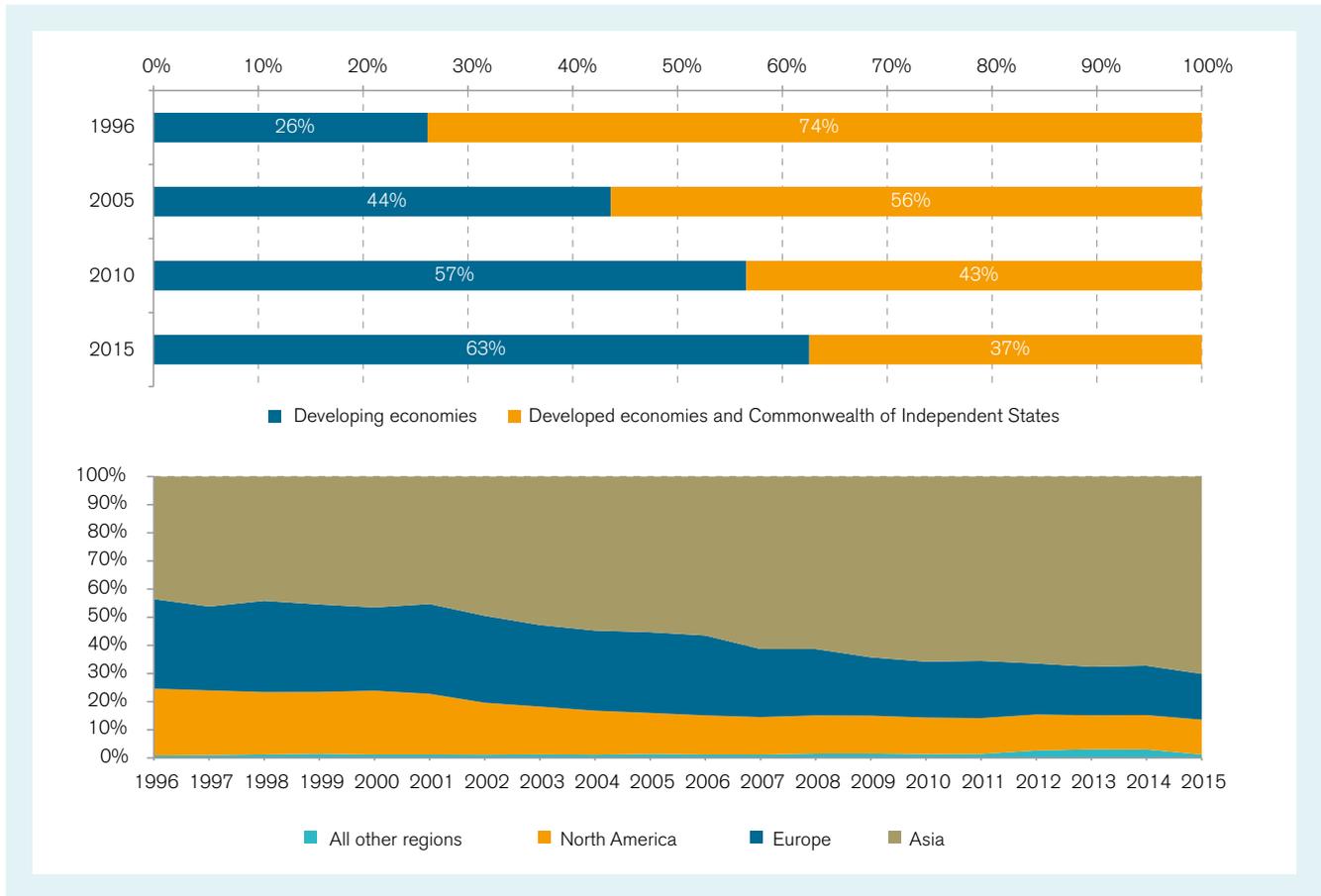
Figure 2.7 shows the leading exporters of ITA products for the years 1996 and 2015. While in 1996, the European Union (then EU-15, whereas it had become EU-28 in 2015) was still the top exporter of ITA products – with an export market share of 31 per cent – that situation had distinctly changed in 2015. At this time, with China covering one-third of world exports of ITA products, the share of the European Union's exports had decreased to 16 per cent, putting the European Union in second place after China. The export share of the United States (the world's second-largest exporter in 1996) fell from 20 per cent in 1996 to 9 per cent in 2015. If the European Union is considered as a single entity, seven of the top ten exporters in 2015 were Asian economies, as compared to six in 1996.

Developing economies' share in world exports of ITA products more than doubled in the past 20 years, increasing from 26 per cent in 1996 to 63 per cent in 2015.

Within the European Union, the largest exporters of ITA products in 1996 were the United Kingdom (representing 6.5 per cent), Germany (5.9 per cent) and the Netherlands (4.1 per cent). In 2015, the European ranking was led by Germany, whose share in world exports of ITA products was 4.0 per cent, followed by the Netherlands (3.3 per cent) and France (1.3 per cent).

Within the top 30 exporters of ITA products in 2015 (see Annex Table 2.2), Viet Nam was the most dynamic, with the highest average annual increase of 50 per cent between 1996 and 2015. Rising from a very low level in 1996 (US\$ 30 million), Viet Nam's exports

Figure 2.6: Exports of ITA products by economic and geographic region (percentage share)



Source: WTO Secretariat, based on UN Comtrade.

reached a value of US\$ 6 billion in 2015, placing it in eighth position in 2015. The second-highest average annual growth was observed for Bahrain (up by 27 per cent per annum), followed by China (23 per cent).

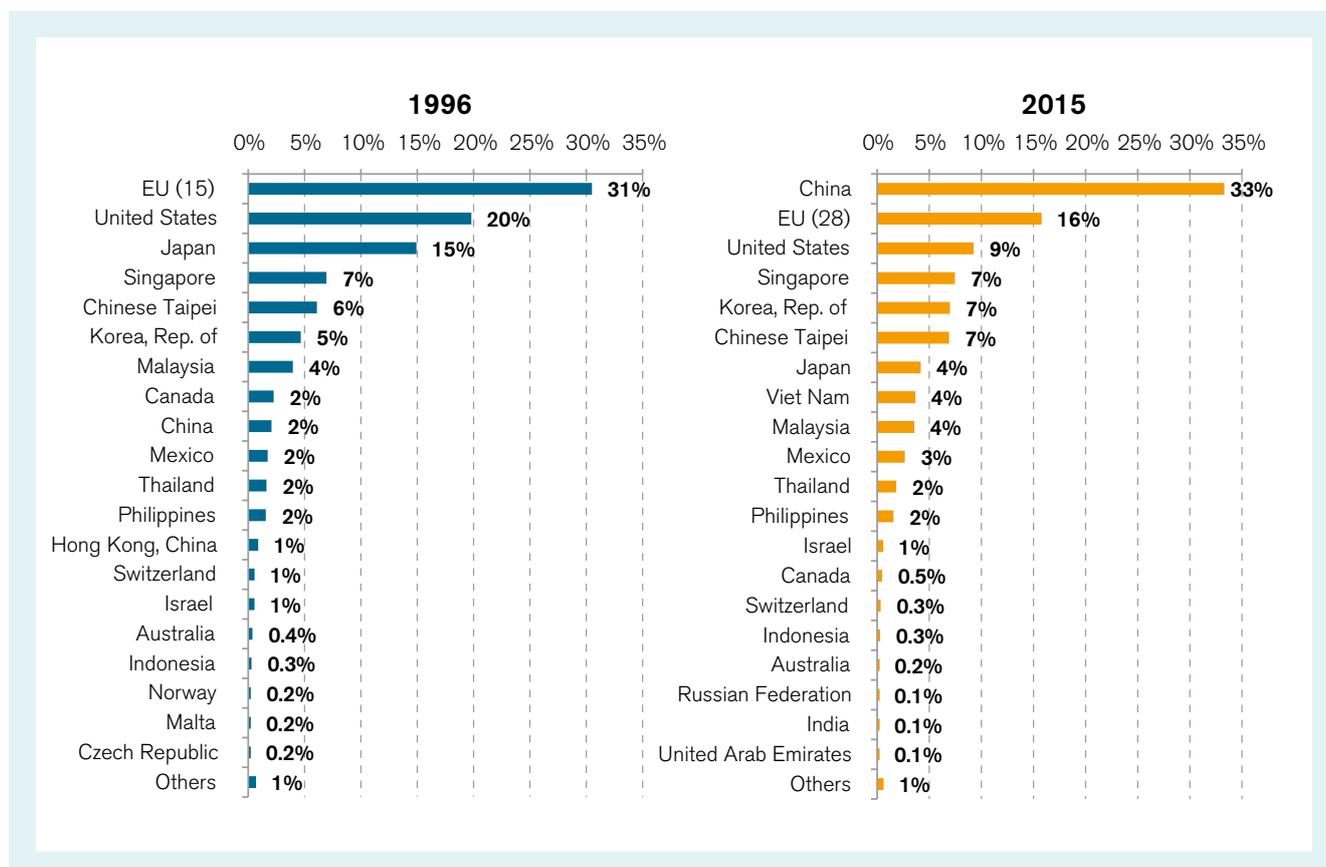
Other participants experiencing strong growth in their exports of ITA products between 1996 and 2015 include the United Arab Emirates (19 per cent per annum, mostly for re-exports) and the Russian Federation (17 per cent). Among the developing economies that do not participate in the ITA, Mexico is still the most important trader, with an export value of US\$ 43.9 billion in 2015 (up by 8 per cent per annum). Most Mexican exports of ITA products are currently destined for the United States under the North American Free Trade Agreement (NAFTA).

Regarding the development of the share of ITA participants in global exports of ITA products, between 1996 and 2002 there was a continuous decline, from 95.6 per cent in 1996 to 87.9 per cent in 2002. In 2003, with the participation of Bahrain, China, Egypt and Morocco in the ITA agreement, the share increased markedly and peaked at 97.5 per cent in 2007. In subsequent years,

Within the top 30 exporters of ITA products in 2015, Viet Nam was the most dynamic, with the highest average annual increase of 50 per cent between 1996 and 2015.

the share stagnated slightly, despite the accession of new participants (such as Montenegro in 2012, Qatar, Russia and Tajikistan in 2013, Afghanistan and Seychelles in 2014, and Kazakhstan in 2015). Nonetheless, with a share of 97.1 per cent in 2015, ITA participants still account for almost the totality of global exports of ITA products.

Figure 2.7: Leading exporters of ITA products: shares in world exports of ITA products (percentage share)



Source: WTO Secretariat, based on UN Comtrade.

E. Leading ITA importers

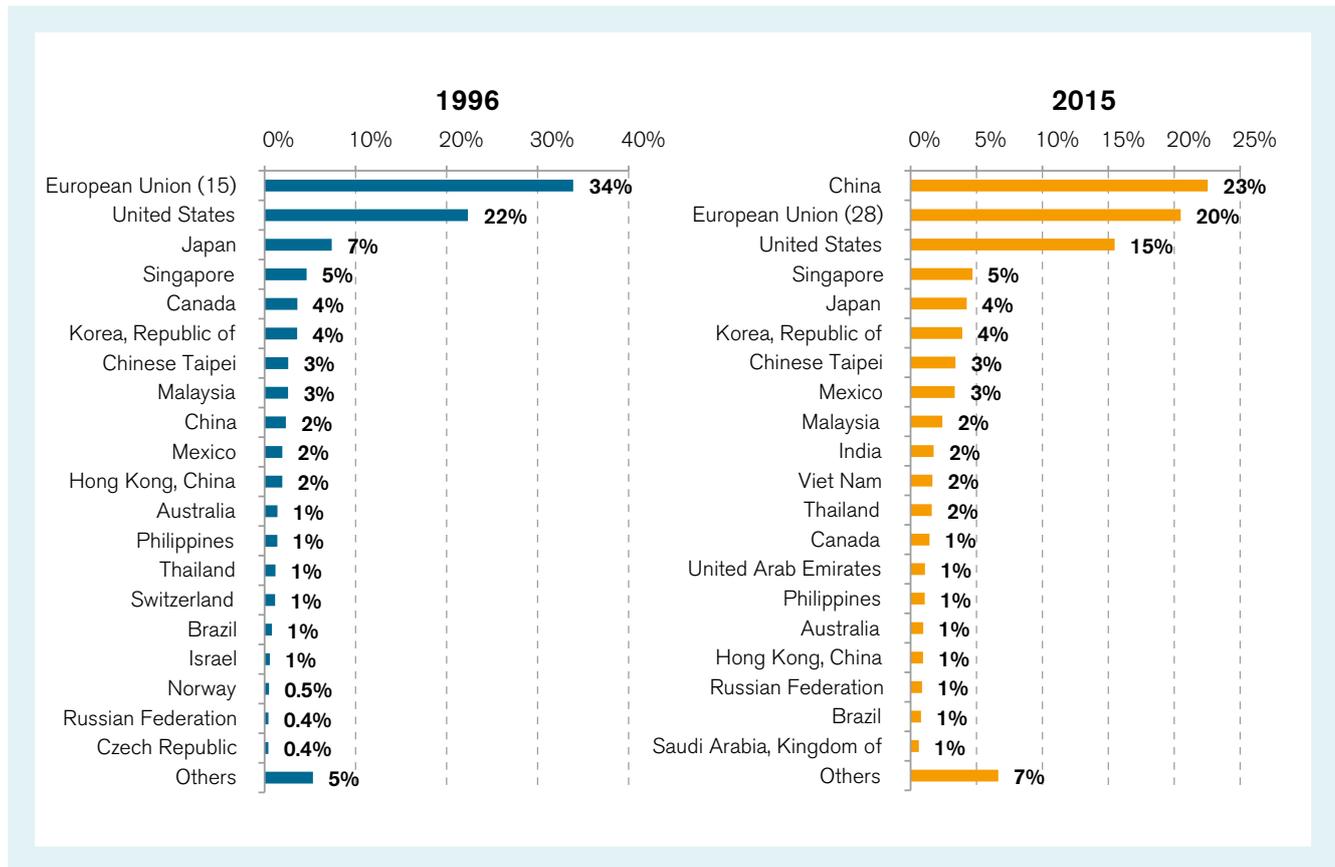
Between 1996 and 2015, world imports of ITA products increased from US\$ 550 billion to US\$ 1,831 billion, which represents an average annual increase of 7 per cent. During the same period, world total imports grew by 6 per cent per annum. The largest importers of ITA products generally also tend to be the largest exporters. Much of the growth since 1996 can be attributed to higher demand by developing economies, for while in 1996, developing economies accounted for 24 per cent of world imports of ITA products, this share increased to 51 per cent by 2015. This is largely linked to the specialization of tasks and reliance on global supply chains in the manufacture of ITA products, with developing economies often involved in the final or further assembly of components previously imported from developed economies.

As can be seen in Figure 2.8, in 2015 China was the largest importer of ITA products (22.5 per cent share of global imports of ITA products), followed by the European

Union (28) (20.5 per cent), the United States (15.5 per cent), Singapore (4.7 per cent) and Japan (4.3 per cent). Regarding growth rates, the highest annual percentage changes over the whole period were recorded for Viet Nam (+28 per cent per annum), India (+20 per cent per annum) and the United Arab Emirates (+18 per cent per annum, mostly in re-exports). Imports by developed-economy markets have continued to grow, but at a much slower rate compared with developing economies.

Of the non-participants, Mexico was the largest importer of ITA products in terms of value, followed by Brazil, South Africa, Argentina and Chile. Imports of ITA products have also increased in non-participants, in particular for Mexico (up by 10 per cent per year). In terms of geographical groupings, imports of ITA products in the Middle East (+12 per cent per annum) and the Commonwealth of Independent States (+11 per cent per annum) rose the most, while imports in Europe (+4 per cent per annum) and North America (+5 per cent per annum) rose the least (see Annex Table 2.1 for a list of the 30 leading importers of ITA products).

Figure 2.8: Leading importers of ITA products: shares in world imports of ITA products (percentage share)



Source: WTO Secretariat, based on UN Comtrade.

F. Trade in ITA products, by product category

Figures 2.9 and 2.10 compare the share of ITA products categories between 1996 and 2015, both for exports and imports. In 1996, “semiconductors” and “computers and calculating machines” represented the categories with the highest shares (28 per cent each) in ITA world exports; 20 years later, the highest share was for “semiconductors” (32 per cent). It was followed by “telecommunication equipment”, the share of which increased from 9 per cent in 1996 to 21 per cent in 2015. “Computers and calculating machines” (20 per cent) fell to fourth position in 2015, after “parts and accessories” (20 per cent). The most distinct positive change in terms of share was observed for exports of “telecommunication equipment”, with an increase of twelve percentage points, which is largely explained by the increasing popularity of mobile phones, including smartphones. The shares of “parts and accessories” and of “computers and calculating machines” lost most in terms of share in world exports (-8 percentage points and -7 percentage points respectively).

A similar development occurred for imports. The share of “telecommunication equipment” more than doubled from 9 per cent in 1996 to 21 per cent in 2015, and “semiconductors” increased by five percentage points. The shares of “computers and calculating machines”, “parts and accessories”, and “data storage media and software provided on physical media” all decreased, while the share of “semiconductor manufacturing equipment” showed a slight increase (by 1 percentage point).

Although the market shares for several of these product categories diminished over the past 20 years due to advances in technology, all product categories increased in value terms between 1996 and 2015, both for exports and imports. Only during the last 10 years was there a decrease in exports of “data storage media and software provided on physical media” (-0.7 per cent per annum) which is explained by a higher degree of online dissemination of data/software. The greatest average annual rises were for “telecommunication equipment” (11.0 per cent for exports and 11.7 per cent for imports), followed by “semiconductor manufacturing equipment” (up by 10.6 per cent for both flows) (see Tables 2.2 and 2.3).

Figure 2.9: World exports of ITA products, by product category (percentage share)

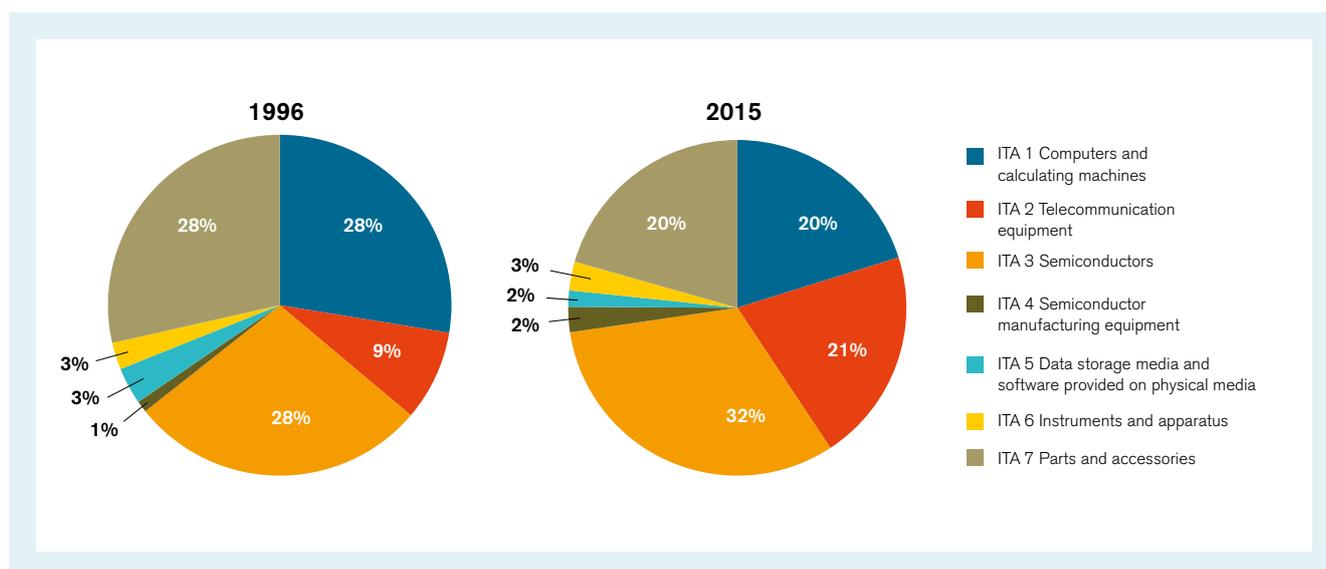
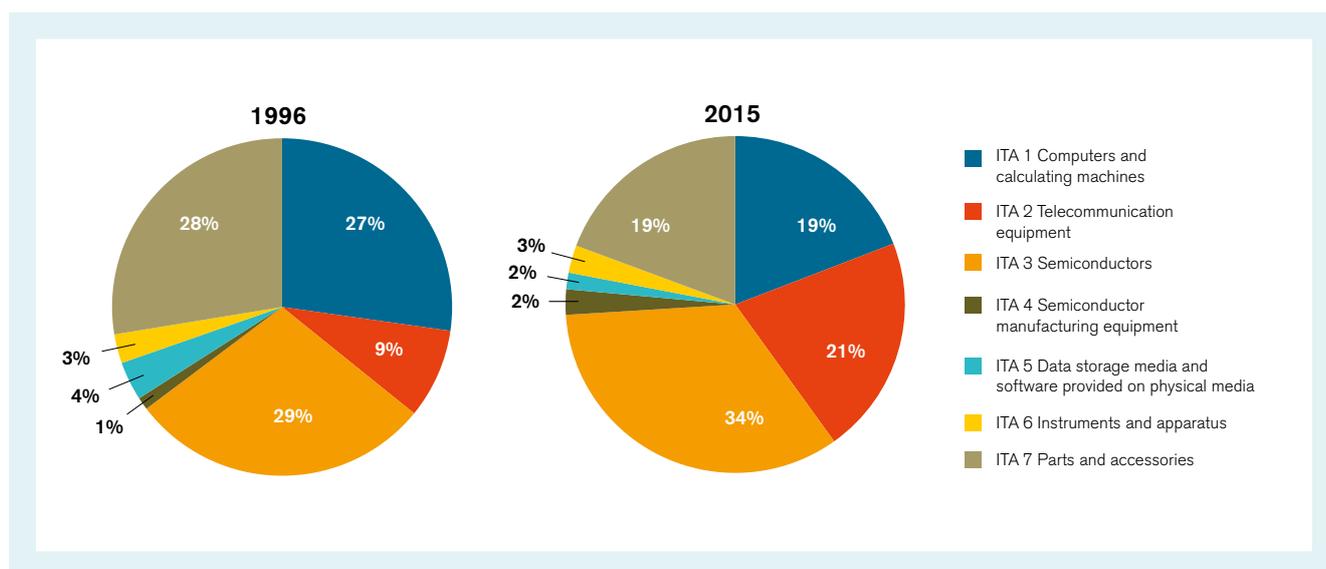


Figure 2.10: World imports of ITA products, by product category (percentage share)



Source: WTO Secretariat, based on UN Comtrade.

Annex Table 2.3 shows the top ten exporters and importers for each ITA product category, comparing 1996 with 2015. China was the largest exporter in 2015 for four of the seven product categories – namely for "computers and calculating machines" (export market share of 46 per cent), "telecommunication equipment" (48 per cent), "semiconductors" (20 per cent) and "parts and accessories" (35 per cent). The EU-28 was the top exporter for "instruments and apparatus" (market share of 24 per cent) and "data storage media and software provided on physical media" (42 per cent); Japan was the leading exporter of "semiconductor manufacturing equipment" (market share of 27 per cent).

The highest increases in export market share between 1996 and 2015 were reached by China, for "telecommunication equipment" (+44 percentage points in market share), "computers and calculating machines" (+43 percentage points) and "parts and accessories" (+33 percentage points). The highest losses in market share were observed for the EU-28 for exports of "telecommunication equipment" (-33 percentage points), "instruments and apparatus" (-22 percentage points) and "parts and accessories" (-17 percentage points). Chinese Taipei gained 18 percentage points for exports of "instruments and apparatus" (reaching a market share of 20 per cent in 2015), while

Singapore rose by 10 percentage points for exports of "semiconductors" (market share of 16 per cent in 2015).

The European Union was still the largest importer in four out of seven categories in 2015 – namely "computers and calculating machines" (import market share of 32 per cent), "telecommunication equipment" (29 per cent), "instruments and apparatus" (30 per cent) and "data storage media and software provided on physical media" (30 per cent). Its market share of global imports has

nonetheless declined since 1996, amid a notable rise in imports to developing economies across all categories. China was the leading importer of "semiconductors" (import market share of 42 per cent), "semiconductor manufacturing equipment" (24 per cent) and "parts and accessories" (27 per cent). The highest changes in market share in both exports and imports were observed for China, with the highest increase in "semiconductors" (+39 percentage points between 1996 and 2015).

Table 2.2: World exports of ITA products, by product category (billion dollars and percentage share)

| ITA product category | Value (US\$ bn) | | | Average annual change (%) | | |
|--|-----------------|---------------|---------------|---------------------------|------------|------------|
| | 1996 | 2005 | 2015 | 1996-2015 | 1996-2005 | 2005-2015 |
| ITA 1 Computers and calculating machines | 151 | 264 | 333 | 4.2 | 6.4 | 2.3 |
| ITA 2 Telecommunication equipment | 47 | 180 | 340 | 11.0 | 16.1 | 6.5 |
| ITA 3 Semiconductors | 154 | 322 | 528 | 6.7 | 8.5 | 5.1 |
| ITA 4 Semiconductor manufacturing equipment | 6 | 17 | 40 | 10.6 | 12.2 | 9.1 |
| ITA 5 Data storage media and software provided on physical media | 19 | 28 | 26 | 1.6 | 4.3 | -0.7 |
| ITA 6 Instruments and apparatus | 14 | 27 | 46 | 6.4 | 7.3 | 5.6 |
| ITA 7 Parts and accessories | 157 | 339 | 340 | 4.2 | 8.9 | 0.0 |
| Total | 548.5 | 1176.7 | 1652.8 | 6.0 | 8.8 | 3.5 |

Source: WTO Secretariat, based on UN Comtrade database.

Table 2.3: World imports of ITA products, by product category (billion dollars and percentage share)

| ITA product category | Value (US\$ bn) | | | Average annual change (%) | | |
|--|-----------------|---------------|---------------|---------------------------|------------|------------|
| | 1996 | 2005 | 2015 | 1996-2015 | 1996-2005 | 2005-2015 |
| ITA 1 Computers and calculating machines | 150 | 284 | 350 | 4.6 | 7.3 | 2.1 |
| ITA 2 Telecommunication equipment | 47 | 174 | 384 | 11.7 | 15.6 | 8.2 |
| ITA 3 Semiconductors | 159 | 378 | 621 | 7.4 | 10.1 | 5.1 |
| ITA 4 Semiconductor manufacturing equipment | 7 | 17 | 45 | 10.6 | 10.8 | 10.3 |
| ITA 5 Data storage media and software provided on physical media | 20 | 28 | 29 | 1.9 | 3.4 | 0.5 |
| ITA 6 Instruments and apparatus | 15 | 28 | 48 | 6.3 | 6.8 | 5.7 |
| ITA 7 Parts and accessories | 152 | 343 | 354 | 4.6 | 9.5 | 0.3 |
| Total | 550.0 | 1251.4 | 1831.1 | 6.5 | 9.6 | 3.9 |

Source: WTO Secretariat, based on UN Comtrade database.

G. Trade in ITA products, by HS subheading

There have been profound changes in the type of ITA products that are being traded, and the trend is to have a higher concentration in fewer categories of products as measured by the number of HS subheadings. While the top ten HS subheadings accounted for 65 per cent of exports of ITA products in 1996, the equivalent figure for 2015 was 76 per cent.

The sequence and composition of the ten most exported ITA products have changed since 1996 (see Figure 2.11). Of the top ten HS subheadings in 1996, seven were still in the top ten in 2015, but with markedly changed shares and/or with a distinctly different ranking. The new products in the top ten list were:

- “Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at least a central processing unit, a keyboard and a display”,
- “Electric apparatus for line telephony, telegraphy: other apparatus” and
- “Photosensitive/photovoltaic/LED semiconductor devices”.

The products that had disappeared from the top ten were:

- “Metal oxide semiconductors (MOS technology)”,
- “Monolithic integrated circuits, except digital” and
- “Parts for radio/TV transmit/receive equipment, nes”.⁷

While back in 1996, “Parts and accessories of data processing equipment, nes” had been the product with the highest share in IT exports (15 per cent), its position dropped to sixth with a share of only 6 per cent in 2016 (-9 percentage points). The second most exported product of 1996, “Metal oxide semiconductors (MOS technology)”, disappeared completely from the top ten products, with its share dropping to 1 per cent (from 11 per cent in 1996). The role of “storage units” (which had the third highest share in 1996) in ITA exports was much less important in 2016 (top seven in 2015; -4 percentage points in terms of share). The most-exported ITA product in 2016 was 'Other monolithic integrated circuits' with a share of 25 per cent in all ITA exports (up from 4 per cent in 1996), followed by 'Transmit-receive apparatus for radio, TV, etc.' (share of 12 per cent, up from 4 per cent) and 'Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at least a central processing unit, a keyboard and a display' (share of 7 per cent, up from 2 per cent).

Though this development is partially explained by the different structure of HS1996 and HS2012, and in particular aggregation of certain product categories under HS2007, other factors may include technological innovation, consumer preferences and price developments. Metal oxide semiconductors (MOS technology) (HS1996 subheading 8542.13) provide an example of technological development. Changes resulting from technological innovation, in particular machines capable of performing two or more previously separate functions, and variations in consumer preferences are often interconnected. For example, the share of portable computers (HS1996 subheading 8471.30) went up by 5 percentage points between 1996 and 2015; this had been driven by both technical progress in terms of the miniaturization of electronic components and by a growing preference for the flexibility of laptops and netbooks over traditional desktop computers. The surge in demand for smartphones provides another example.

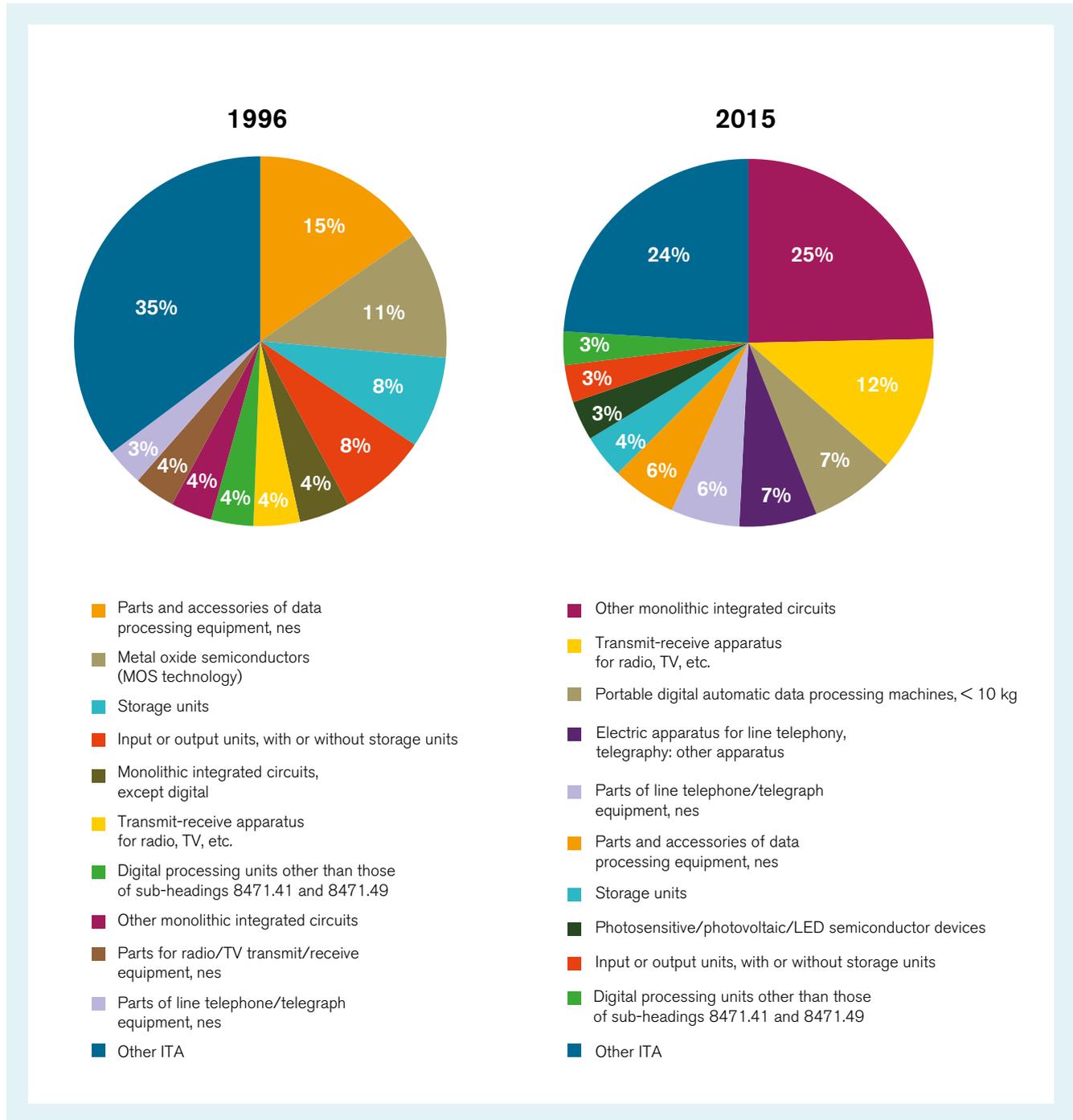
H. Share of ITA products in total trade of major traders

The role of ITA products regarding total merchandise exports and imports varies significantly among the major players in international merchandise trade (see Figure 2.12). The highest shares of ITA products in their exports were observed for the Philippines (22 per cent in 2015, up from 21 per cent in 1996), Chinese Taipei (20 per cent, up from 15 per cent) and Singapore (18 per cent, down from 28 per cent). For several economies, such as Argentina, Australia, Brazil, Chile, Colombia, India, Norway, Russian Federation, South Africa and Turkey, ITA products were of very little significance in terms of share in total exports (shares all below 1 per cent in 2015).

Regarding imports, the highest shares of ITA in total imports were recorded for Singapore (14 per cent in 2015, down from 16 per cent in 1996), Hong Kong, China⁸ (14 per cent, down from 22 per cent), the Philippines (14 per cent in both 2016 and 1996) and Chinese Taipei (14 per cent, up from 9 per cent). The lowest shares were observed for Morocco, Switzerland and Bahrain (all 2 per cent or less in 2015).

For most of the economies shown in Figure 2.12, the share of ITA in total trade decreased between 1996 and 2015. One reason is that, as explained above, ITA products have become cheaper over this period, whereas some non-ITA related products have increased their value, thereby affecting the share of ITA trade in total trade. Exceptions to this phenomenon are economies such as Viet Nam

■ **Figure 2.11: World exports of ITA products: top 10 HS subheadings (percentage share)**



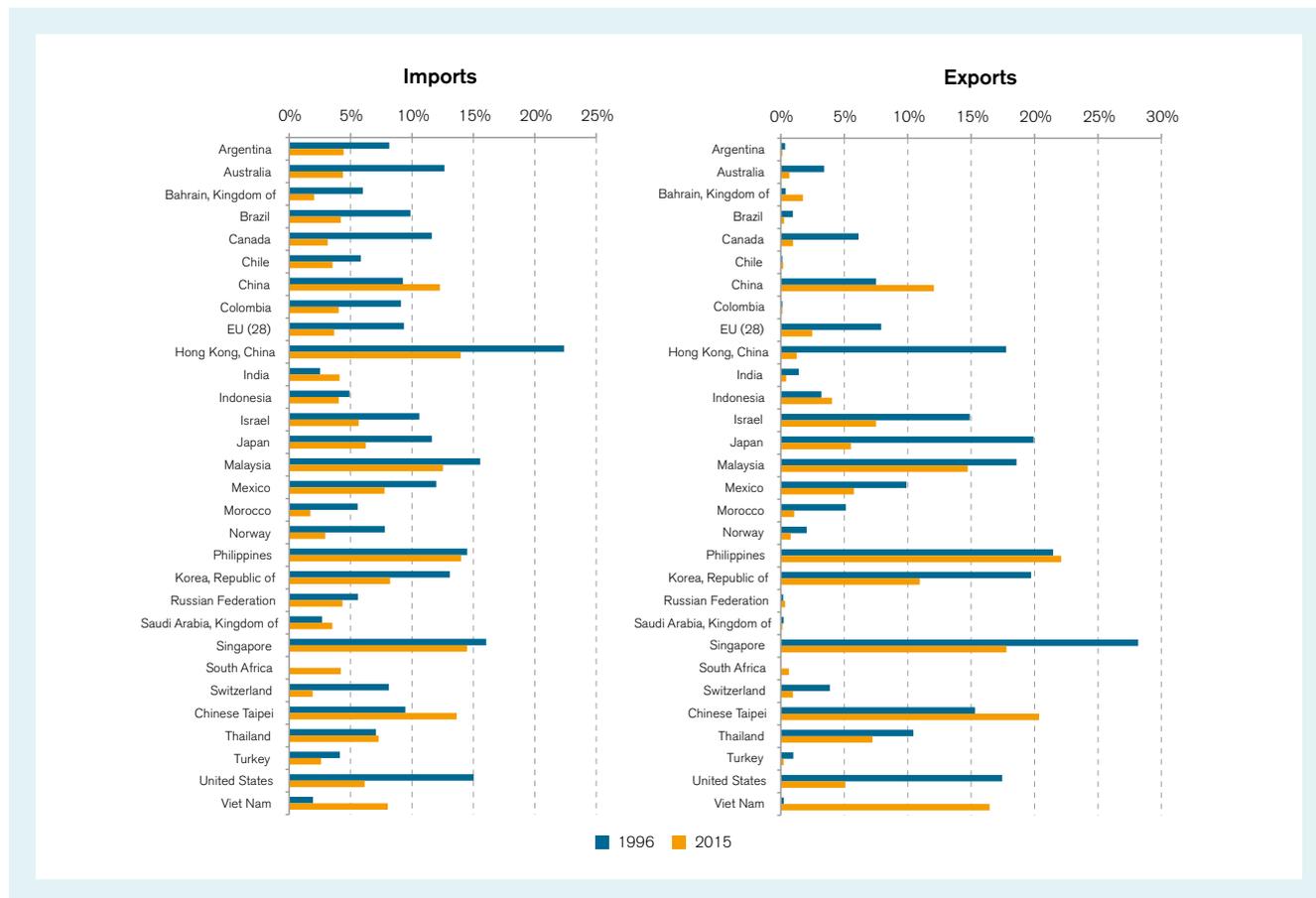
Source: WTO Secretariat, based on UN Comtrade.

and China, where the share of ITA products in total trade increased between 1996 and 2015 (+16 percentage points in Viet Nam's exports and +5 percentage points in China's exports) in spite of the circumstances mentioned above. The economies with the highest losses were Hong Kong (China) and Japan, where the shares went down by 17 and 14 percentage points respectively.

I. Trade in intermediate goods as evidence of global value chains

Apart from the stage in the production chain where final products meet final demand, trade that takes place within GVCs is essentially characterized by trade in

Figure 2.12: Share of ITA products in total imports/exports of major traders, 1996 versus 2015 (percentage share)



Source: WTO Secretariat, based on UN Comtrade.

intermediates. This is also true for ICT supply chains in which numerous production steps deal with the manufacture of sophisticated electronic components.

Intermediate goods are defined as those produced for incorporation at a later stage in the production of a final good, which then is classified either as a consumption or investment good. Transistors and electronic circuits used in smartphones are examples of intermediate goods. The distinction between intermediate and final goods is not always straightforward, as some goods can be used as final goods by households, but can also be purchased by industries for intermediate consumption. Based on the United Nations Classification by Broad Economic Categories (BEC), intermediate goods as referred to within this chapter include all parts and accessories (BEC codes 42 and 53) as well as industrial primary and processed intermediate goods (BEC codes 111, 121, 21 and 22). Fuels and lubricants are excluded.

When focusing on major global manufacturers such as the European Union (EU extra-trade only), China,

Japan or the United States, the most traded electronic components are monolithic integrated circuits (i.e. chips or microchips). As shown in Figure 2.13, the latter turn out to be the top intermediate goods both exported and imported by China, Japan and the United States. Integrated circuits are particularly significant for China, as they represented 22.5 per cent of the total imports of industrial inputs in 2015 (against 17.7 per cent in 2010), which confirms the leading role of China as an assembler of electronic consumer goods. As for Japan, the shares observed for integrated circuits were very similar in both its total exports and imports of intermediate goods, around 6.7 per cent in 2015, as shown in Figure 2.13. This may reflect the prominent role of Japan in the Asian ICT GVCs, in which Japan imports low or middle-technology electronic circuits and exports high value-added parts and components designed for final production steps and, in particular, assembly, to other South East Asian economies. The United States is a net exporter of monolithic integrated circuits, and these are mainly destined for Mexico and South-East Asia.

Several BEC categories related to car parts and accessories, like “Motor vehicles parts, nes”, “Transmissions for motor vehicles” or “Parts and accessories of bodies for motor vehicles”. These also appear to be major intermediate goods traded by the economies under review. This is for example the case for Japan and the United States, whose carmakers outsource a significant part of their production to developing economies. As for the European Union, car-related inputs do not appear as much in the top traded intermediate goods. Since only EU extra-trade is considered, this may reflect that automobile GVCs in Europe mainly take place within EU member economies. In this respect, strong industrial relationships have been set up in the automobile sector between Germany and certain Eastern European economies such as the Czech Republic and Poland, especially since they joined the European Union in 2004. Several BEC categories related to the aircraft industry (“Aircraft parts, nes” or parts of “Turbo-jet engines”) appear in the top 10 intermediate goods traded by the European Union with non-EU partners, thus reflecting that the European air industry has outsourced some of its production out of the EU area. The same categories appear in both the export and import side, suggesting potential back-and-forth exchanges of aircraft parts between the European Union and its external manufacturing partners.

Data on trade in intermediate goods therefore provide insights into the activity taking place within international production chains. However, by recording international transactions each time a good crosses a border, gross trade statistics count the value of intermediate goods exchanged within GVCs as many times as they cross the border. In addition, traditional import statistics normally record as the “country of origin” the last country in the production chain where a substantial transformation has taken place or where the good changes tariff codes. This fails to reflect the geographical fragmentation of the manufacturing process and the transaction value assigned to the last country cannot be used as an indication of the value added of this country.

The degree of overestimation due to multiple counting is suggested by Figure 2.13, where the same electronic parts and components are exported and imported by all the economies under review. Trade in value added terms (TiVA) avoids this multiple counting issue observed in gross statistics. With TiVA, the geographical origins of the value added are identified and separated and there is no duplication of values. This approach is illustrated in the next section.

J. Insights on Trade in Value Added (TiVA) and GVCs in ITA-related industries

Trade in Value Added (TiVA) is a statistical approach that allows traditional gross trade flows splitting into value-added components, mainly along the lines of domestic or foreign origin.

The domestic value-added content of exports represents the level of domestic inputs used for the production of exported goods and services and describes the actual contribution of trade to an economy. The foreign content of exports, also referred to as vertical specialization, corresponds to the value added of inputs imported from GVC partners in order to produce the exported goods and services.

TiVA data and GVC-related indicators used in this box are sourced from the OECD-WTO TiVA database. The latter is incrementally improved for its coverage of economies. Currently, data are available for a set of benchmark years up to 2011 and for 34 industries based on the International Standard Industrial Classification ISIC (Revision 3). Under the ISIC, the industry that best approximates ITA product coverage is “computer, electronic and optical equipment” (ISIC Rev. 3 codes 30, 32 and 333). On the services side, the “Computer and related activities” industry (ISIC Rev. 3 code 72) can also be considered to examine the role of ITA-related services.

Figure 2.14 shows the levels of domestic and foreign value added content in exports of “Computer, electronic and optical equipment” in 2011.

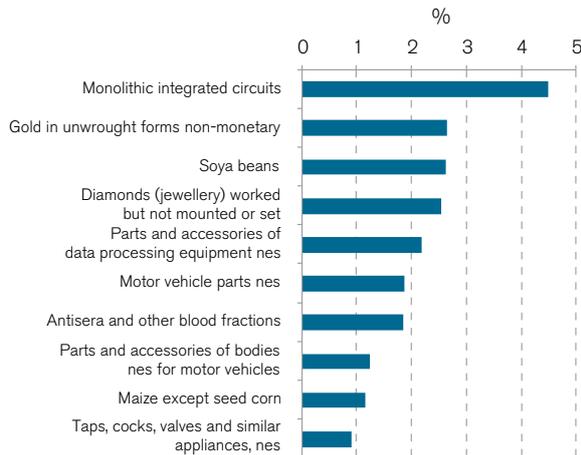
Most developed economies incorporate a large share of domestic value added in their ITA-related exports, above 60 per cent. One developing economy, the Philippines, presents the same pattern. Indeed, it successfully attracted export-oriented foreign direct investment in the electronics industry, especially in the area of semi-conductor assembling and integrated circuits.

A high share of domestic value added reflects not only the capacity to produce manufactured inputs but also to provide services embedded in the industrial process. These so-called “manu-services” play a growing role in the manufacturing industry especially for the development of sophisticated products. For instance, France’s and Japan’s exports of “Computer, electronic and optical equipment” products contained a large proportion of domestic services value added in 2011, respectively 55 per cent and 29 per cent.

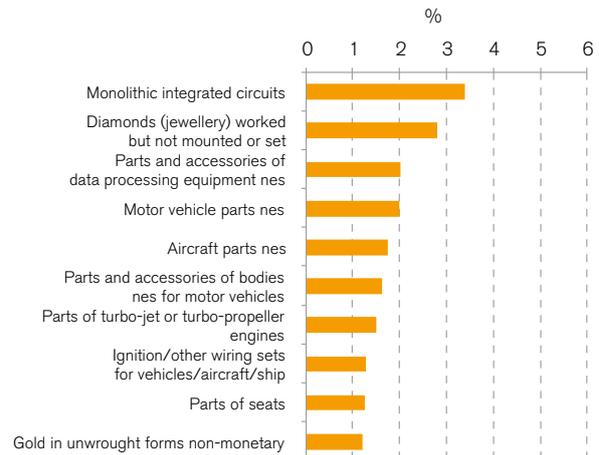
Figure 2.13: Trade in intermediates goods by selected ITA participants – top 10 products of intermediate goods, share (%) in total exports and imports of intermediate goods, 2015

United States

Top 10 products of intermediate goods, share (%) in total exports of intermediate goods, 2015

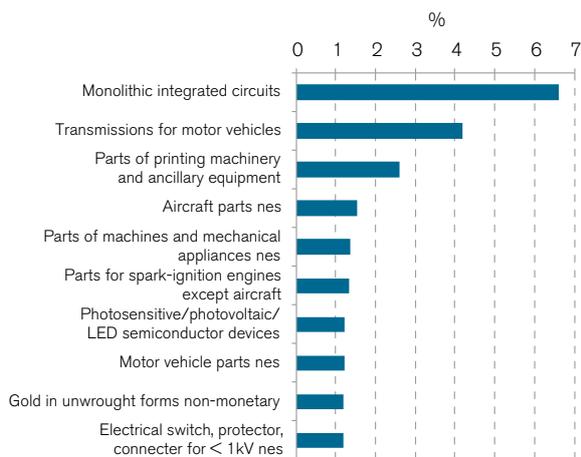


Top 10 products of intermediate goods, share (%) in total imports of intermediate goods, 2015

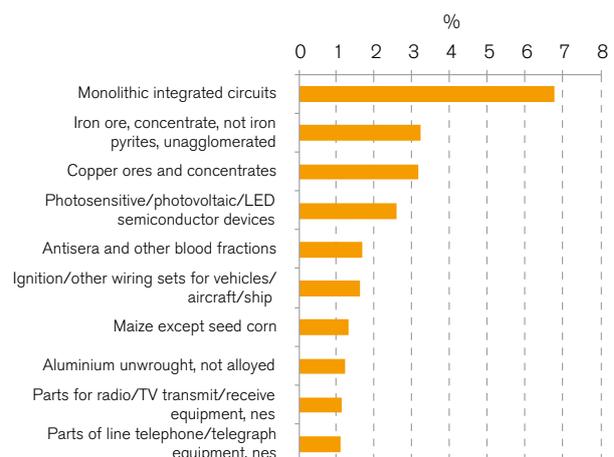


Japan

Top 10 products of intermediate goods, share (%) in total exports of intermediate goods, 2015



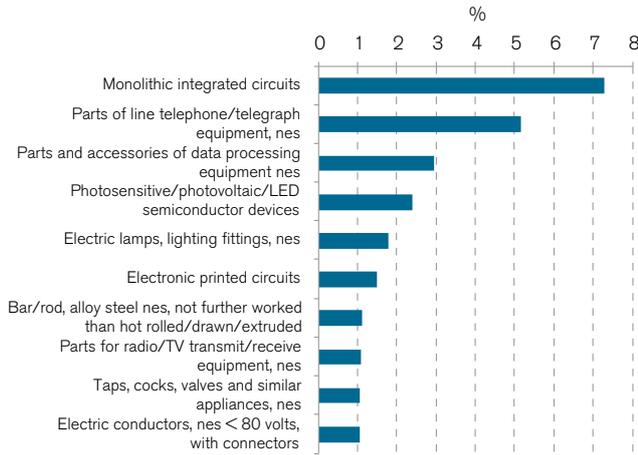
Top 10 products of intermediate goods, share (%) in total imports of intermediate goods, 2015



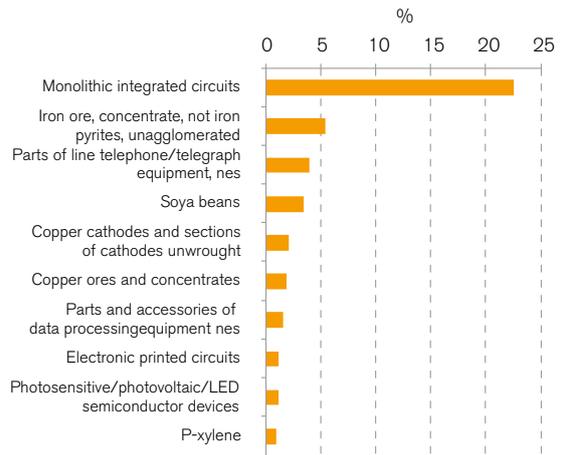
Source: UN Comtrade database.

China

Top 10 products of intermediate goods, share (%) in total exports of intermediate goods, 2015

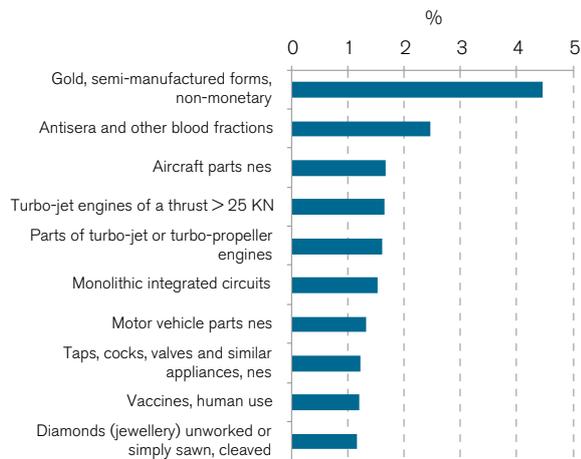


Top 10 products of intermediate goods, share (%) in total imports of intermediate goods, 2015

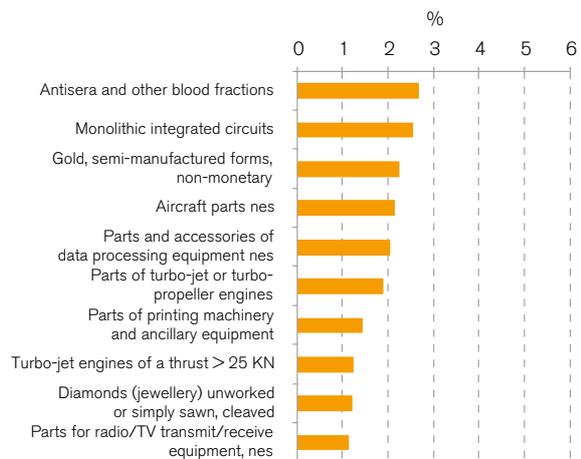


EU (28) extra-trade

Top 10 products of intermediate goods, share (%) in total exports of intermediate goods, 2015



Top 10 products of intermediate goods, share (%) in total imports of intermediate goods, 2015



Source: UN Comtrade database.

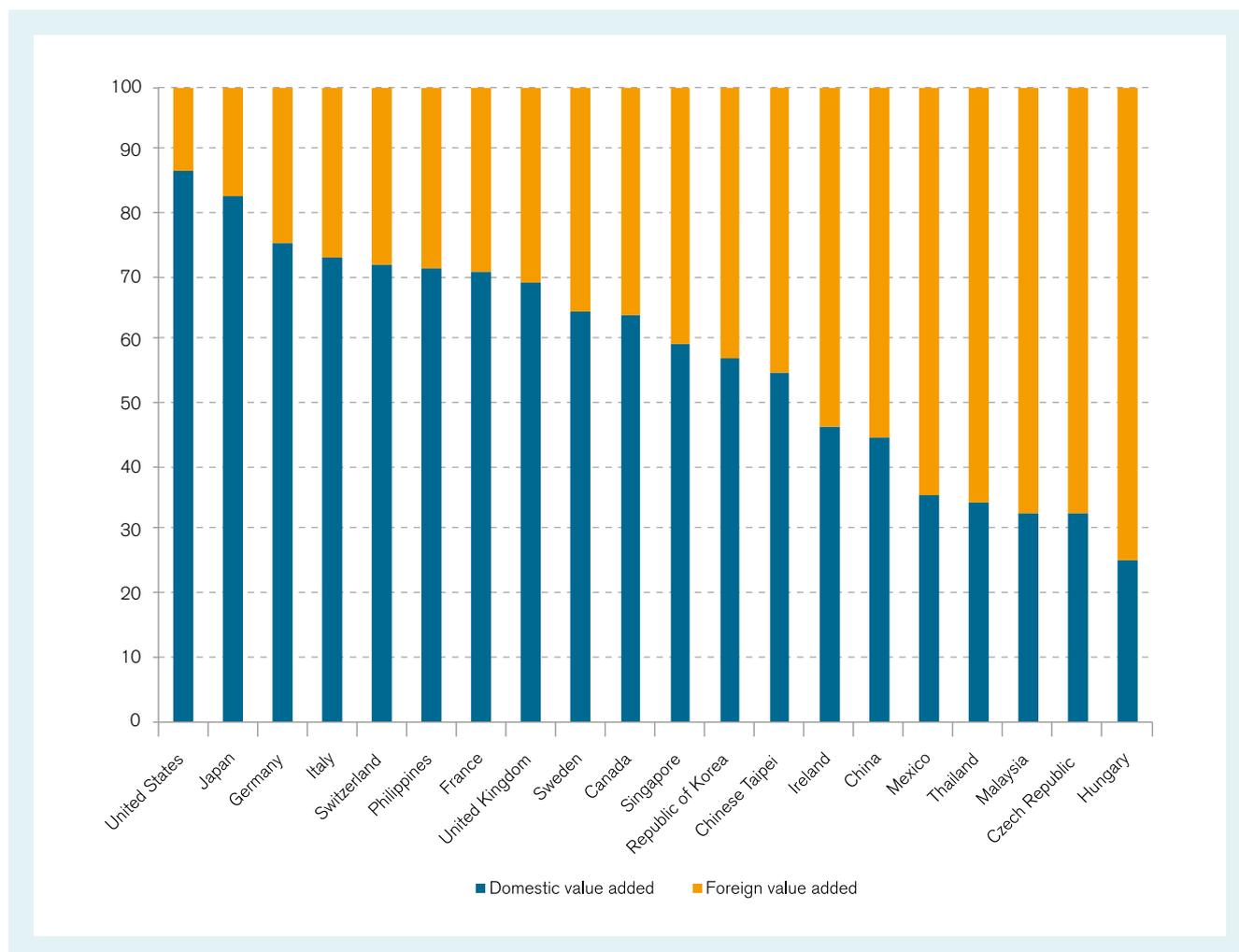
In contrast to France and Japan, Hungary and the Czech Republic include mostly foreign value-added inputs in their exports of ITA-related products, with rates of vertical specialization amounting respectively to 74.1 per cent and 67.1 per cent. Since they joined the European Union in 2004, both these economies have developed industrial linkages with European supply chains, notably in the ITA sector, as they import hardware components for computer assembly and export. ASEAN (i.e. Association of Southeast Asian Nations) economies like Malaysia and Thailand play a similar role in the Asian electronics industry by specializing in labour-intensive activities relying on significant imports of electronic components.

Additionally, economies highly involved in processing trade, such as China and Mexico, present high rates of vertical specialization in ITA-related industries, respectively 55 per cent and 64.1 per cent in 2011,

demonstrating that processing zones' exports rely almost entirely on the import of inputs.

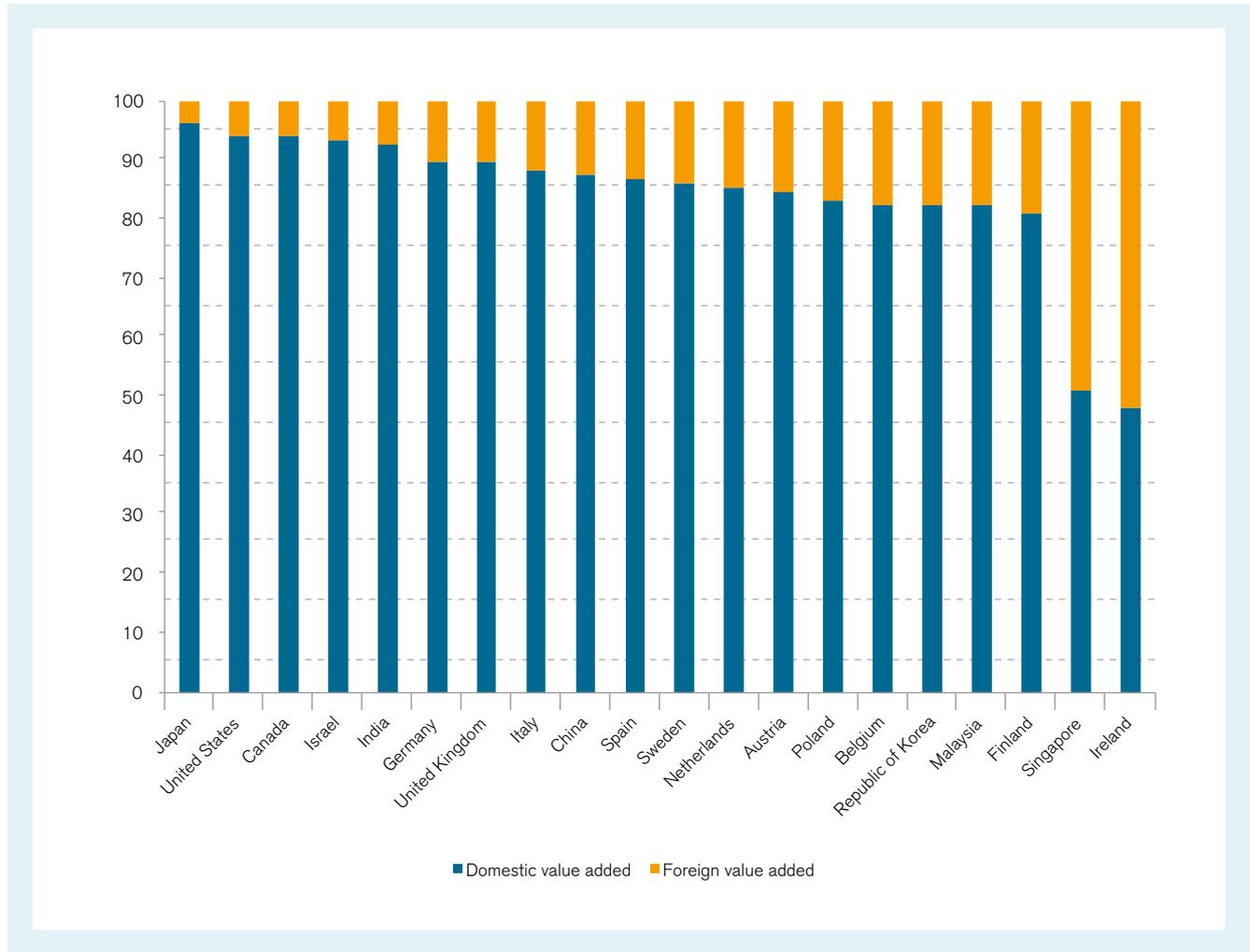
For most of the economies shown in Figure 2.15, the exports of computer and related services are primarily composed of domestic value added, which often represents more than 80 per cent of the whole value-added content. Ireland and Singapore stand out from this line with shares of foreign value-added content in their exports of computer services amounting to around 50 per cent in 2011. In general, the imported inputs embedded to services exports relate to a large extent to other "intermediate" services hired to foreign companies, thus illustrating the development of services networks. For example, services represented respectively 86 per cent and 73 per cent of the foreign value added contained in Ireland's and Singapore's exports of computer services in 2011.

Figure 2.14: Domestic and foreign value-added content in exports of computer, electronic and optical equipment, major exporters, 2011 (percentage of total exports)



Source: OECD-WTO TIVA database.

Figure 2.15: Domestic and foreign value-added content in exports of computer and related services, major exporters, 2011 (percentage of total exports)



Source: OECD-WTO TiVA database.

The measurement of GVC participation draws on the TiVA approach and is composed of two elements reflecting the upstream and downstream links in the production chain. Basically, individual economies participate in global value chains by importing foreign inputs to produce the goods and services they export (backward GVC participation or vertical specialization, as mentioned above), and also by exporting domestically produced inputs to partners in charge of downstream production stages (forward GVC participation).

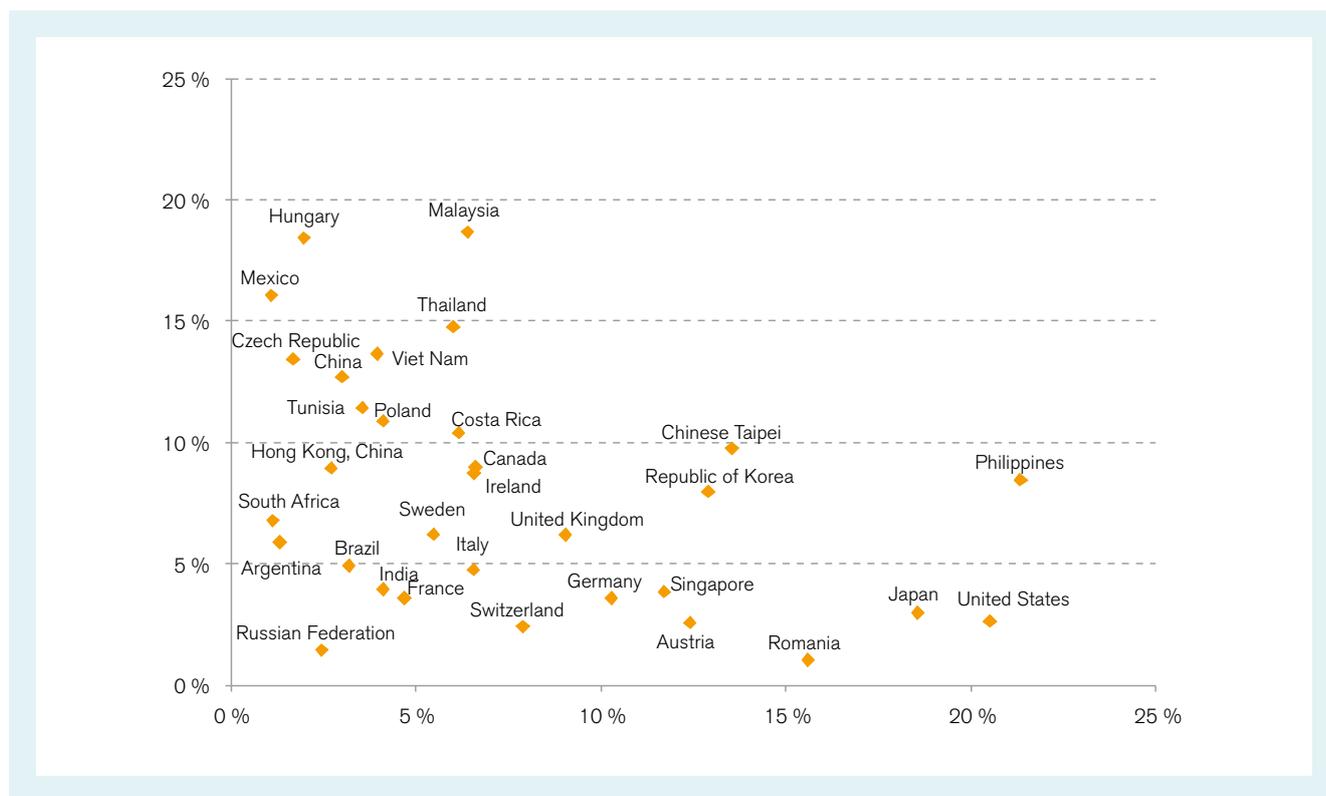
Figure 2.16 illustrates the forward and backward linkages for a set of exporting economies in “Computer, electronic and optical equipment” GVCs. Large economies like Japan and the United States appear to be major upstream providers of electronic components. They have the industrial capacity to produce domestically the inputs required for their production, which reduces

their dependency vis-à-vis imports of value added components, as illustrated by their low rate of backward GVC participation of around 3 per cent in 2011.

The Philippines are a major actor with 30 per cent of their trade in that sector stemming from or destined for GVCs, the highest share observed in sampled economies. The Philippines act as both an upstream and a downstream partner within Asian ITA-related supply chains, with a strong specialization in the production and export of electronic components. Indeed, 21 per cent of the Philippines' exports of goods in the category “computer, electronic and optical equipment” are disseminated along the sector's production chains.

The economies with the highest degrees of vertical specialization show low forward participation in GVCs, which confirms their focus on activities carried out at the end of the ITA production chain (e.g. assembling). This is the case for some Eastern European (Czech

Figure 2.16: Forward and backward participation in GVCs producing goods in the “computer, electronic and optical equipment” category in 2011, selected economies (percentage of total exports in the reference industry)



Source: OECD-WTO TIVA database.

Republic, Hungary) or East Asian (Malaysia, Thailand) economies, as well as economies where processing trade is predominant, like China and Mexico. Other Central and Eastern European economies, like Austria and Romania, can be located on the opposite side of Figure 2.16. They are characterized by a stronger forward production integration and act as suppliers of specialized technological inputs in European supply chains.

Other developing economies like Viet Nam or Costa Rica are well integrated into GVCs, importing foreign inputs and, to a lesser extent, acting as upstream suppliers. Their

development within GVCs is largely due to the presence of global technology corporations resulting from incentive policies to attract foreign direct investment. The Republic of Korea and Chinese Taipei hold central positions within Asian supply chains and show strong participations in ITA-related GVCs. Their total GVC participation (both forward and backward) in this sector stands respectively at 21 per cent and 23 per cent. Their higher rate of forward participation maybe related to their production and export of high value-added electronic components.

Annex 2.1

■ **Annex Table 2.1: The 30 leading importers of ITA products in 2015**

| Rank | Main importers | Value (US\$ bn) | | Share (%) | | Average annual change (%) |
|-----------------------------|--------------------------|-----------------|---------------|--------------|--------------|---------------------------|
| | | 1996 | 2015 | 1996 | 2015 | 1996-2015 |
| ITA participants | | | | | | |
| 1 | China | 12.9 | 412.8 | 2.3 | 22.5 | 20 |
| 2 | European Union (28) | 194.0 | 375.2 | 35.3 | 20.5 | 4 |
| | Extra-EU (28) imports | 103.9 | 229.9 | 18.9 | 12.6 | 4 |
| | Intra-EU (28) imports | 90.2 | 145.3 | 16.4 | 7.9 | 3 |
| 3 | United States | 122.9 | 283.5 | 22.3 | 15.5 | 4 |
| 4 | Singapore | 25.4 | 86.0 | 4.6 | 4.7 | 7 |
| 5 | Japan | 40.6 | 78.0 | 7.4 | 4.3 | 3 |
| 6 | Korea, Republic of | 19.7 | 71.7 | 3.6 | 3.9 | 7 |
| 7 | Chinese Taipei | 14.3 | 62.3 | 2.6 | 3.4 | 8 |
| 9 | Malaysia | 14.2 | 44.1 | 2.6 | 2.4 | 6 |
| 10 | India | 1.0 | 32.0 | 0.2 | 1.7 | 20 |
| 11 | Viet Nam | 0.3 | 30.3 | 0.1 | 1.7 | 28 |
| 12 | Thailand | 6.6 | 29.4 | 1.2 | 1.6 | 8 |
| 13 | Canada | 19.8 | 26.3 | 3.6 | 1.4 | 1 |
| 14 | United Arab Emirates* | 0.8 | 19.9 | 0.1 | 1.1 | 18 |
| 15 | Philippines | 7.7 | 19.6 | 1.4 | 1.1 | 5 |
| 16 | Australia | 7.8 | 17.5 | 1.4 | 1.0 | 4 |
| 17 | Hong Kong, China | 10.7 | 17.3 | 1.9 | 0.9 | 3 |
| 18 | Russian Federation | 2.3 | 15.9 | 0.4 | 0.9 | 11 |
| 20 | Saudi Arabia, Kingdom of | 0.7 | 11.5 | 0.1 | 0.6 | 16 |
| 21 | Turkey | 1.8 | 10.8 | 0.3 | 0.6 | 10 |
| 22 | Indonesia | 2.1 | 10.7 | 0.4 | 0.6 | 9 |
| 23 | Switzerland | 6.4 | 9.7 | 1.2 | 0.5 | 2 |
| 24 | Israel | 3.2 | 7.0 | 0.6 | 0.4 | 4 |
| 27 | Norway | 2.7 | 4.5 | 0.5 | 0.2 | 3 |
| 29 | Colombia | 1.2 | 4.4 | 0.2 | 0.2 | 7 |
| 30 | Egypt | 0.5 | 3.3 | 0.1 | 0.2 | 10 |
| ITA non-participants | | | | | | |
| 8 | Mexico | 10.7 | 61.4 | 1.9 | 3.4 | 10 |
| 19 | Brazil | 4.4 | 14.4 | 0.8 | 0.8 | 6 |
| 25 | South Africa | ... | 6.7 | ... | 0.4 | - |
| 26 | Argentina | 2 | 5.3 | 0.4 | 0.3 | 5 |
| 28 | Chile | 0.8 | 4.4 | 0.1 | 0.2 | 9 |
| World** | | 550.0 | 1831.1 | 100.0 | 100.0 | 7 |

Source: WTO Secretariat based on UN Comtrade.

Notes: Figures exclude those ITA products that are grouped together with other non-ITA products in tariff and trade classifications, with exception of HS1996 "ex-"codes 8529.90 and 8456.10, which are completely included.

* Includes significant re-exports.

** World totals include intra-EU trade but exclude re-exports of Hong Kong, China. Estimates for missing reporters are based on mirror data.

Annex Table 2.2: The 30 leading exporters of ITA products in 2015

| Rank | Main importers | Value (US\$ bn) | | Share (%) | | Average annual change (%) |
|-----------------------------|--------------------------|-----------------|---------------|--------------|--------------|---------------------------|
| | | 1996 | 2015 | 1996 | 2015 | 1996-2015 |
| ITA participants | | | | | | |
| 1 | China | 11.3 | 550.5 | 2.1 | 33.3 | 23 |
| 2 | European Union (28) | 170.0 | 260.7 | 31.0 | 15.8 | 2 |
| | Extra-EU (28) exports | 60.8 | 90.7 | 11.1 | 5.5 | 2 |
| | Intra-EU (28) exports | 109.3 | 170.0 | 19.9 | 10.3 | 2 |
| 3 | United States | 108.6 | 152.8 | 19.8 | 9.2 | 2 |
| 4 | Singapore | 38.1 | 123.3 | 6.9 | 7.5 | 6 |
| 5 | Korea, Republic of | 25.6 | 115.4 | 4.7 | 7.0 | 8 |
| 6 | Chinese Taipei | 33.4 | 114.0 | 6.1 | 6.9 | 7 |
| 7 | Japan | 81.9 | 69.1 | 14.9 | 4.2 | -1 |
| 8 | Viet Nam | 0.0 | 60.6 | 0.0 | 3.7 | 50 |
| 9 | Malaysia | 21.7 | 59.0 | 4.0 | 3.6 | 5 |
| 11 | Thailand | 8.9 | 30.5 | 1.6 | 1.8 | 7 |
| 12 | Philippines | 8.6 | 25.9 | 1.6 | 1.6 | 6 |
| 13 | Israel | 3.1 | 9.6 | 0.6 | 0.6 | 6 |
| 14 | Canada | 12.4 | 7.9 | 2.3 | 0.5 | -2 |
| 15 | Switzerland | 3.1 | 5.6 | 0.6 | 0.3 | 3 |
| 16 | Indonesia | 1.6 | 4.8 | 0.3 | 0.3 | 6 |
| 17 | Australia | 2.1 | 2.5 | 0.4 | 0.2 | 1 |
| 18 | Russian Federation | 0.1 | 2.3 | 0.0 | 0.1 | 17 |
| 19 | India | 0.5 | 2.2 | 0.1 | 0.1 | 9 |
| 20 | United Arab Emirates* | 0.1 | 1.9 | 0.0 | 0.1 | 19 |
| 21 | Norway | 1.0 | 1.6 | 0.2 | 0.1 | 3 |
| 24 | Turkey | 0.2 | 0.6 | 0.0 | 0.0 | 6 |
| 25 | Bahrain, Kingdom of | 0.0 | 0.5 | 0.0 | 0.0 | 27 |
| 26 | Morocco | 0.4 | 0.5 | 0.1 | 0.0 | 1 |
| 28 | New Zealand | 0.2 | 0.4 | 0.0 | 0.0 | 4 |
| 29 | Hong Kong, China | 4.9 | 0.3 | 0.9 | 0.0 | -13 |
| 30 | Saudi Arabia, Kingdom of | 0.1 | 0.3 | 0.0 | 0.0 | 6 |
| ITA non-participants | | | | | | |
| 10 | Mexico | 9.5 | 43.9 | 1.7 | 2.7 | 8 |
| 22 | Brazil | 0.4 | 1.0 | 0.1 | 0.1 | 5 |
| 23 | South Africa | ... | 0.9 | ... | 0.1 | - |
| 27 | Tunisia | 0.0 | 0.4 | 0.0 | 0.0 | 14 |
| World** | | 548.5 | 1652.8 | 100.0 | 100.0 | 6 |

Source: WTO Secretariat based on UN Comtrade.

Notes: Figures exclude those ITA products that are grouped together with other non-IT products in tariff and trade classifications, with exception of HS1996 "ex-" codes 8529.90 and 8456.10, which are completely included.

* Includes significant re-exports.

** World totals include intra-EU trade but exclude re-exports of Hong Kong, China. Estimates for missing reporters are based on mirror data.

Annex Table 2.3: Top ten exporters and importers of ITA products, ranked by 2015 value
(billion dollars and percentage share)

| EXPORTS | | | | | IMPORTS | | | | |
|---|-----------------|-------|-----------|------|--------------------------|-----------------|-------|-----------|------|
| Economy | Value (US\$ bn) | | Share (%) | | Economy | Value (US\$ bn) | | Share (%) | |
| | 1996 | 2015 | 1996 | 2015 | | 1996 | 2015 | 1996 | 2015 |
| ITA 1 Computers and calculating machines | | | | | | | | | |
| China | 3.9 | 153.4 | 3 | 46 | EU (28) | 64.6 | 111.4 | 43 | 32 |
| EU (28) | 49.1 | 68.5 | 32 | 21 | EU (28) extra-trade | 33.2 | 68.2 | 22 | 19 |
| EU (28) extra-trade | 9.3 | 16.8 | 6 | 5 | EU (28) intra-trade | 31.3 | 43.2 | 21 | 12 |
| EU (28) intra-trade | 39.9 | 51.7 | 26 | 16 | United States | 40.2 | 91.6 | 27 | 26 |
| United States | 25.3 | 27.7 | 17 | 8 | China | 1.0 | 28.2 | 1 | 8 |
| Mexico | 2.7 | 19.2 | 2 | 6 | Japan | 12.5 | 16.3 | 8 | 5 |
| Thailand | 4.4 | 13.5 | 3 | 4 | Mexico | 1.3 | 10.4 | 1 | 3 |
| Singapore | 20.8 | 11.0 | 14 | 3 | Canada | 6.0 | 9.1 | 4 | 3 |
| Malaysia | 6.1 | 8.3 | 4 | 2 | Australia | 2.8 | 7.2 | 2 | 2 |
| Viet Nam | 0.0 | 6.9 | 0 | 2 | Singapore | 3.6 | 7.1 | 2 | 2 |
| Korea, Republic of | 4.7 | 5.5 | 3 | 2 | Korea, Republic of | 2.5 | 6.4 | 2 | 2 |
| Philippines | 1.9 | 4.7 | 1 | 1 | India | 0.2 | 6.2 | 0 | 2 |
| ITA 2 Telecommunication equipment | | | | | | | | | |
| China | 1.8 | 163.7 | 4 | 48 | EU (28) | 17.6 | 111.0 | 37 | 29 |
| EU (28) | 24.3 | 62.2 | 52 | 18 | EU (28) extra-trade | 8.8 | 69.5 | 19 | 18 |
| EU (28) extra-trade | 12.3 | 18.0 | 26 | 5 | EU (28) intra-trade | 8.8 | 41.5 | 19 | 11 |
| EU (28) intra-trade | 12.0 | 44.2 | 25 | 13 | United States | 7.1 | 99.2 | 15 | 26 |
| United States | 7.9 | 32.2 | 17 | 9 | Japan | 2.9 | 20.0 | 6 | 5 |
| Viet Nam | 0.0 | 28.6 | 0 | 8 | Mexico | 0.8 | 11.7 | 2 | 3 |
| Korea, Republic of | 1.2 | 12.3 | 3 | 4 | United Arab Emirates | 0.3 | 11.4 | 1 | 3 |
| Mexico | 0.9 | 10.7 | 2 | 3 | India | 0.1 | 10.8 | 0 | 3 |
| Singapore | 0.6 | 9.5 | 1 | 3 | Canada | 1.6 | 9.5 | 3 | 2 |
| Chinese Taipei | 1.1 | 4.8 | 2 | 1 | China | 1.5 | 9.0 | 3 | 2 |
| Malaysia | 1.4 | 3.6 | 3 | 1 | Singapore | 0.9 | 7.7 | 2 | 2 |
| Canada | 1.5 | 2.2 | 3 | 1 | Saudi Arabia, Kingdom of | 0.2 | 7.5 | 0 | 2 |
| ITA 3 Semiconductors | | | | | | | | | |
| China | 1.1 | 104.3 | 1 | 20 | China | 3.5 | 258.5 | 2 | 42 |
| Singapore | 8.5 | 82.0 | 6 | 16 | Singapore | 12.2 | 57.2 | 8 | 9 |
| Chinese Taipei | 7.8 | 77.5 | 5 | 15 | EU (28) | 37.6 | 55.3 | 24 | 9 |
| Korea, Republic of | 15.0 | 56.9 | 10 | 11 | EU (28) extra-trade | 23.9 | 31.9 | 15 | 5 |
| EU (28) | 31.6 | 46.9 | 20 | 9 | EU (28) intra-trade | 13.7 | 23.4 | 9 | 4 |
| EU (28) extra-trade | 15.3 | 19.6 | 10 | 4 | United States | 36.9 | 40.7 | 23 | 7 |
| EU (28) intra-trade | 16.3 | 27.3 | 11 | 5 | Korea, Republic of | 9.8 | 36.0 | 6 | 6 |
| United States | 35.4 | 41.0 | 23 | 8 | Chinese Taipei | 7.6 | 34.3 | 5 | 6 |
| Malaysia | 10.3 | 33.7 | 7 | 6 | Malaysia | 10.1 | 27.4 | 6 | 4 |
| Japan | 29.6 | 31.6 | 19 | 6 | Japan | 12.8 | 24.4 | 8 | 4 |
| Philippines | 4.8 | 17.4 | 3 | 3 | Mexico | 3.7 | 18.2 | 2 | 3 |
| Viet Nam | 0.0 | 13.5 | 0 | 3 | Philippines | 4.9 | 14.3 | 3 | 2 |

| EXPORTS | | | | | IMPORTS | | | | |
|---|-----------------|------|-----------|------|---------------------|-----------------|------|-----------|------|
| Economy | Value (US\$ bn) | | Share (%) | | Economy | Value (US\$ bn) | | Share (%) | |
| | 1996 | 2015 | 1996 | 2015 | | 1996 | 2015 | 1996 | 2015 |
| ITA 4 Semiconductor manufacturing equipment | | | | | | | | | |
| Japan | 2.6 | 10.8 | 43 | 27 | China | 0.1 | 10.8 | 1 | 24 |
| United States | 2.2 | 10.3 | 36 | 26 | Chinese Taipei | 1.1 | 10.2 | 17 | 23 |
| EU (28) | 1.0 | 9.1 | 16 | 23 | Korea, Republic of | 1.3 | 6.5 | 19 | 15 |
| EU (28) extra-trade | 0.7 | 7.9 | 12 | 20 | United States | 1.1 | 4.3 | 17 | 10 |
| EU (28) intra-trade | 0.3 | 1.2 | 4 | 3 | EU (28) | 1.6 | 3.7 | 24 | 8 |
| Korea, Republic of | 0.0 | 3.2 | 0 | 8 | EU (28) extra-trade | 1.3 | 2.6 | 20 | 6 |
| Singapore | 0.0 | 2.8 | 0 | 7 | EU (28) intra-trade | 0.2 | 1.1 | 4 | 3 |
| Chinese Taipei | 0.0 | 1.0 | 0 | 3 | Japan | 0.8 | 3.3 | 11 | 7 |
| China | 0.0 | 0.9 | 0 | 2 | Hong Kong, China | 0.0 | 2.1 | 0 | 5 |
| Switzerland | 0.2 | 0.9 | 3 | 2 | Singapore | 0.3 | 1.3 | 5 | 3 |
| Israel | 0.0 | 0.5 | 0 | 1 | Malaysia | 0.1 | 0.5 | 1 | 1 |
| Malaysia | 0.0 | 0.4 | 0 | 1 | Viet Nam | 0.0 | 0.3 | 0 | 1 |
| ITA 5 Instruments and apparatus | | | | | | | | | |
| EU (28) | 8.8 | 6.2 | 46 | 24 | EU (28) | 9.3 | 8.5 | 46 | 29 |
| EU (28) extra-trade | 2.0 | 1.5 | 10 | 6 | EU (28) extra-trade | 3.2 | 4.4 | 16 | 15 |
| EU (28) intra-trade | 6.8 | 4.7 | 36 | 18 | EU (28) intra-trade | 6.1 | 4.1 | 30 | 14 |
| Chinese Taipei | 0.4 | 5.3 | 2 | 20 | United States | 2.6 | 6.1 | 13 | 21 |
| China | 0.4 | 4.1 | 2 | 16 | China | 0.2 | 3.6 | 1 | 12 |
| Singapore | 0.3 | 3.8 | 2 | 14 | Thailand | 0.6 | 1.8 | 3 | 6 |
| Malaysia | 0.1 | 1.8 | 1 | 7 | India | 0.0 | 1.3 | 0 | 5 |
| United States | 4.1 | 1.6 | 21 | 6 | Japan | 1.0 | 1.0 | 5 | 3 |
| Japan | 2.7 | 1.2 | 14 | 4 | Singapore | 1.6 | 0.9 | 8 | 3 |
| Korea, Republic of | 1.1 | 0.8 | 6 | 3 | Chinese Taipei | 0.2 | 0.7 | 1 | 2 |
| Viet Nam | 0.0 | 0.2 | 0 | 1 | Mexico | 0.4 | 0.6 | 2 | 2 |
| Mexico | 0.5 | 0.2 | 2 | 1 | Canada | 0.8 | 0.4 | 4 | 1 |
| ITA 6 Data storage media and software provided on physical media | | | | | | | | | |
| EU (28) | 6.8 | 19.2 | 48 | 42 | EU (28) | 7.0 | 14.4 | 46 | 30 |
| EU (28) extra-trade | 2.6 | 10.9 | 19 | 24 | EU (28) extra-trade | 3.2 | 8.1 | 21 | 17 |
| EU (28) intra-trade | 4.2 | 8.3 | 30 | 18 | EU (28) intra-trade | 3.8 | 6.4 | 25 | 13 |
| United States | 3.5 | 10.2 | 25 | 22 | China | 0.4 | 8.2 | 2 | 17 |
| China | 0.3 | 3.7 | 2 | 8 | United States | 2.0 | 7.7 | 13 | 16 |
| Japan | 1.1 | 2.4 | 8 | 5 | Korea, Republic of | 0.7 | 1.7 | 5 | 4 |
| Singapore | 0.3 | 2.4 | 2 | 5 | Canada | 0.5 | 1.5 | 3 | 3 |
| Switzerland | 0.6 | 1.6 | 4 | 3 | Japan | 0.9 | 1.3 | 6 | 3 |
| Malaysia | 0.1 | 1.3 | 1 | 3 | Singapore | 0.3 | 1.1 | 2 | 2 |
| Mexico | 0.2 | 0.9 | 1 | 2 | Mexico | 0.3 | 1.0 | 2 | 2 |
| Canada | 0.2 | 0.8 | 2 | 2 | India | 0.1 | 1.0 | 1 | 2 |
| Korea, Republic of | 0.1 | 0.6 | 1 | 1 | Australia | 0.3 | 0.7 | 2 | 2 |

| EXPORTS | | | | | IMPORTS | | | | |
|------------------------------------|-----------------|-------|-----------|------|---------------------|-----------------|------|-----------|------|
| Economy | Value (US\$ bn) | | Share (%) | | Economy | Value (US\$ bn) | | Share (%) | |
| | 1996 | 2015 | 1996 | 2015 | | 1996 | 2015 | 1996 | 2015 |
| ITA 7 Parts and accessories | | | | | | | | | |
| China | 3.9 | 120.4 | 3 | 35 | China | 6.2 | 94.6 | 4 | 27 |
| EU (28) | 48.5 | 48.6 | 31 | 14 | EU (28) | 56.3 | 71.0 | 37 | 20 |
| EU (28) extra-trade | 18.6 | 16.0 | 12 | 5 | EU (28) extra-trade | 30.2 | 45.4 | 20 | 13 |
| EU (28) intra-trade | 29.9 | 32.6 | 19 | 10 | EU (28) intra-trade | 26.2 | 25.5 | 17 | 7 |
| Korea, Republic of | 3.5 | 36.1 | 2 | 11 | United States | 33.0 | 33.9 | 22 | 10 |
| United States | 30.3 | 29.9 | 19 | 9 | Mexico | 4.1 | 19.1 | 3 | 5 |
| Chinese Taipei | 11.9 | 21.2 | 8 | 6 | Korea, Republic of | 3.7 | 15.8 | 2 | 4 |
| Japan | 26.8 | 18.3 | 17 | 5 | Viet Nam | 0.1 | 14.6 | 0 | 4 |
| Singapore | 7.5 | 11.9 | 5 | 3 | Japan | 9.8 | 11.7 | 6 | 3 |
| Viet Nam | 0.0 | 11.0 | 0 | 3 | Singapore | 6.5 | 10.7 | 4 | 3 |
| Malaysia | 3.6 | 9.9 | 2 | 3 | Chinese Taipei | 3.5 | 9.1 | 2 | 3 |
| Mexico | 3.6 | 9.7 | 2 | 3 | Malaysia | 2.6 | 8.9 | 2 | 3 |

Source: WTO Secretariat, based on UN Comtrade.

Endnotes

- For more information regarding these ITA participants, see WTO (2012), Chapter III.
- Out of the 53 ITA participants, only three have outstanding commitments for implementation, namely Afghanistan, Colombia and Tajikistan. Afghanistan and Tajikistan joined the ITA recently and are expected to implement the last tariff cut in 2019 and 2018, respectively. Colombia's tariff reduction is scheduled to be completed this year.
- The full list of ITA Participants, with respective accession dates, is reproduced on page 91.
- See Chapter 3, Section A.
- The ITA does not differentiate its product coverage beyond Attachment A (with two sections) and Attachment B. However, in this publication, ITA products have been classified into seven categories: (1) computers and calculating machines; (2) telecommunication equipment; (3) semiconductors; (4) semiconductor manufacturing equipment; (5) data storage media and software provided on physical media; (6) instruments and apparatus; and (7) parts and accessories. The same classification of ITA products was used in WTO (2012).
- These trade data need to be treated with caution as they can be inflated by double counting where IT products are manufactured in global supply chains with components sometimes crossing borders several times.
- "nes" indicates "not elsewhere specified".
- Data for Hong Kong, China in this chapter refer to domestic exports and/or retained imports only.

Chapter 3

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- *The ITA membership has continued to grow and now includes 53 participants, representing 82 WTO members. It is expected that participation in the ITA will grow further in the near future.*
 - *By binding and eliminating duties and other charges on ITA products in their WTO schedules, ITA participants extend duty-free treatment to all WTO members on a most-favoured nation (MFN) basis.*
 - *ITA participants have succeeded in narrowing down divergences in the classification of 33 ITA products, meaning that all participating economies can now classify these goods on a common basis, which has allowed for more transparent and predictable trade of these products.*
 - *In 2015, the ITA Committee organized a "Workshop on Non-Tariff Barriers Affecting Trade in ICT products", which attracted some 120 participants ranging from ICT industry representatives to the private sector, business associations and academics.*

The ITA Committee: 20 years of boosting trade in IT products

The Information Technology Agreement (ITA) Committee was established on 26 March 1997 to carry out the following functions: 1) reviewing the status of implementation of the Agreement; 2) reviewing the product coverage; 3) conducting consultations regarding non-tariff measures on trade in IT products; 4) considering divergences in classification; and 5) encouraging increased participation in the ITA. These functions are attributed to it by the Ministerial Declaration on Trade in Information Technology Products¹ and the decision on the Implementation of the Ministerial Declaration on Trade in Information Technology Products.²

In the past 20 years, the ITA Committee has achieved important results. Participation in the agreement has increased from 14 to 53 participants,³ representing 82 WTO members and accounting for approximately 97 per cent of world trade in ITA products. Participation in the ITA is expected to grow further. The Committee also managed to reduce the classification divergences in products covered by the ITA and to stimulate discussions on non-tariff measures affecting trade in IT products.

This chapter summarizes the main developments in the ITA Committee in the past 20 years.

A. Implementation of the ITA

The ITA Committee periodically reviews the status of implementation of the ITA, in accordance with the requirements of paragraph 1 and 2 of the Ministerial Declaration, to ensure that implementation of the tariff concessions is carried out according to the agreement. This allows ITA participants to verify that the tariff reduction and elimination commitments are undertaken as scheduled and to discuss any issue or concern that may arise with respect to the agreement.

In order to implement their ITA commitments, participants are required to follow two procedures. At the national level, participants have to undertake domestic procedures that are necessary to reflect the tariff reductions negotiated in their national tariff schedule. At the multilateral level, participants have to modify their WTO schedules of concessions in order to incorporate the new tariff concessions undertaken under the ITA pursuant to the General Agreement on Tariffs and Trade (GATT) Decision on Procedures for Modification and Rectification of Schedules of

Tariff Concessions of 26 March 1980 (the "1980 Procedures").⁴ However, modification of WTO schedules is not required for members that acceded recently to the WTO and that included ITA tariff concessions in their schedules, annexed to the protocols of accession and bound on the date of accession to the WTO.

The review of the status of implementation of the ITA is conducted at each ITA Committee meeting based on a document prepared by the WTO Secretariat, which is regularly updated and provides information on the level of implementation, including domestic ratification processes and procedures followed by each participant to modify their WTO schedules.⁵

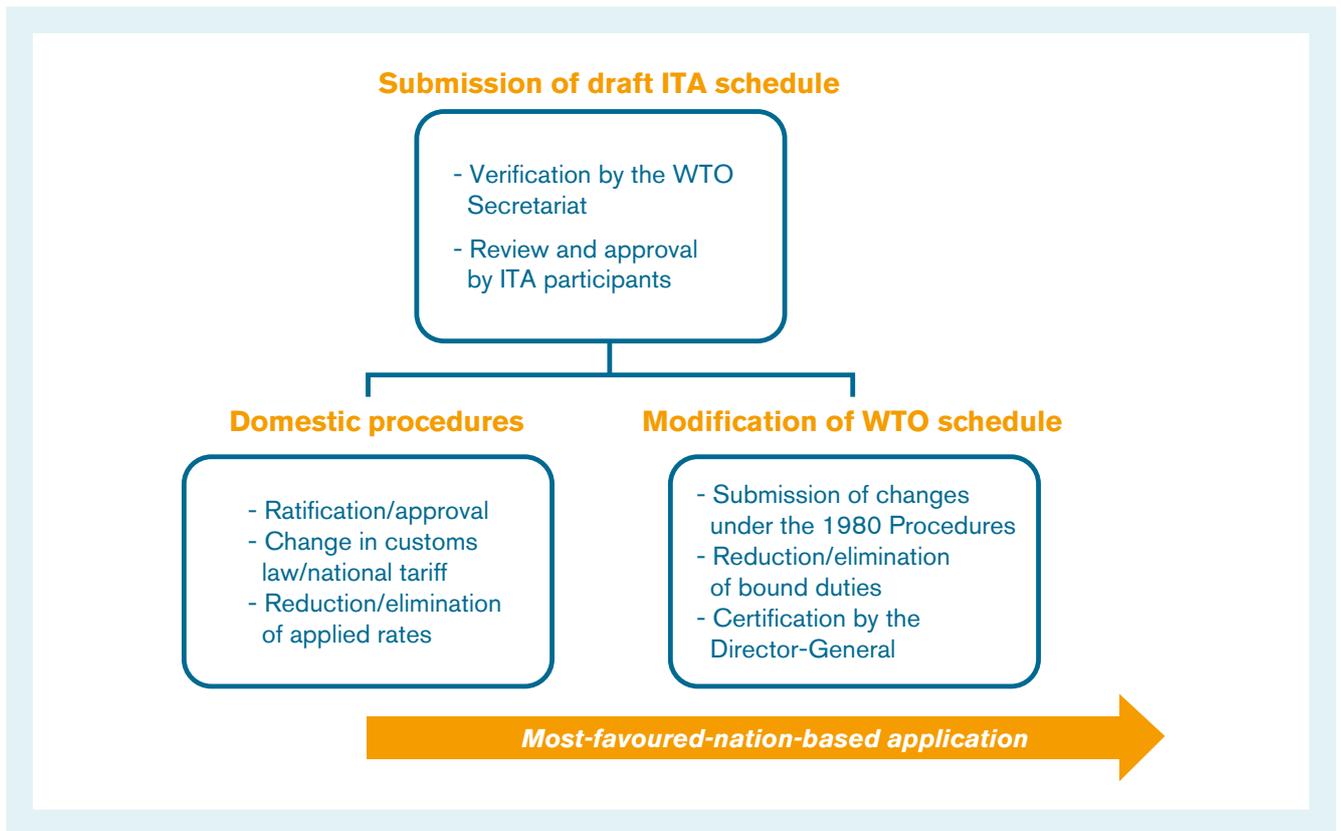
To date, the Committee has recorded good progress in the implementation of the ITA, as 51 ITA participants have undertaken the necessary steps to bind and eliminate duties and other charges on ITA products in their WTO schedules, either under the 1980 Procedures or through their inclusion in the schedule annexed to the protocol of accession.⁶

The incorporation of ITA concessions into the WTO schedule is particularly important as it allows all WTO members to benefit from trade liberalization under the ITA through the application of the most-favoured nation, or MFN (i.e. the principle of not discriminating between one's trading partners) principle (see Figure 3.1). In addition, trade in ITA products is thereby rendered more predictable, as the obligation to apply zero tariffs reflected in the schedule becomes legally binding and enforceable under the WTO dispute settlement mechanism.⁷

The ITA Committee also serves as a forum for discussions on matters, including trade concerns, relating to the implementation of the ITA.

Fifty-one ITA participants have undertaken the necessary steps to bind and eliminate duties and other charges on ITA products in their WTO schedules.

■ **Figure 3.1: “Multilateralizing” ITA commitments**



Source: WTO Secretariat.

B. Divergences in the classification of ITA products

The ITA covers 203 products which are listed in two attachments to the Declaration. Products in "Attachment A" are defined by a six-digit Harmonized System (HS) code, an international nomenclature established by the World Customs Organization for the classification of traded goods. Up to the six-digit level (or subheading), the HS is the same for all the economies that make use of this nomenclature. However, ITA products included in "Attachment B" to the Declaration are identified on the basis of the product description instead of a HS code because of the difficulties participants encountered in identifying or agreeing to a common HS code. This means that the WTO schedules of ITA participants do not have the same HS codes for the classification of the 55 Attachment B items. The bulk of the divergences in the classification of Attachment B products relate mostly to parts and accessories of semiconductor equipment, semiconductor manufacturing equipment, and computers.

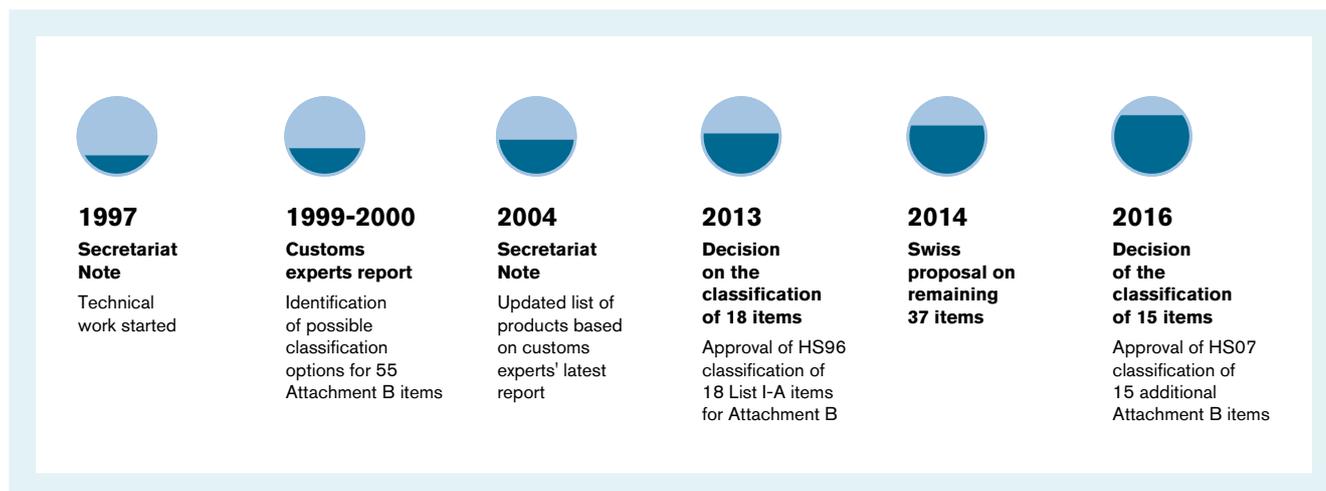
In order to resolve this issue, paragraph 5 of the Annex to the ITA establishes that the ITA Committee shall meet

In the past five years, participants have successfully managed to reduce divergences in the classification of Attachment B products.

as often as necessary to consider any divergence in the classification of ITA products in order to achieve, where appropriate, a common classification among participants within the existing HS nomenclature.

The ITA Committee began technical work on classification divergences in 1997. For more than a decade, participants' technical experts worked intensively with a view to narrowing down those divergences. In 2004, the progress of such discussions was captured in a note prepared by the WTO Secretariat where the divergences were narrowed down to one or more

■ **Figure 3.2: Narrowing down divergences in the classification of Attachment B products**



Source: WTO Secretariat.

classification options (see Figure 3.2).⁹ However, it was only in the past five years, that participants have successfully managed to reduce divergences in the classification of Attachment B products.⁹

The first substantive results were reached in July 2013 when the Committee adopted the first “Decision on the classification of certain Attachment B products”, encompassing 18 products.¹⁰ Then, in 2016, the Committee endorsed the classification of 15 additional Attachment B items, bringing the total number of products with an agreed HS classification to 33.¹¹ To date, 22 Attachment B items remain to be classified under a common HS code by all ITA participants.

This first decision for the classification of 18 Attachment B items was circulated by the Chairman of the ITA Committee in October 2011. However, at that time, its adoption was complicated by the fact that the proposed subheadings used to classify the 18 items under the HS 1996 were affected by the introduction of the HS 2007, a newer version of the nomenclature. Despite these difficulties, the Committee continued its work to narrow down divergences among participants and eventually agreed on a common classification in the HS 1996 nomenclature of the 18 ITA items for which one classification option was identified in the Secretariat note.¹² The 2013 Decision covers products such as semiconductors, monitors, and optical disc storage units including CD drives and DVD drives. Pursuant to this decision, ITA participants were required to modify their WTO tariff schedules, if necessary, in order to reflect the agreed HS codes and to ensure that binding commitments on such products were properly recorded.

Also in 2013, the Committee started discussing possible ways to address the classification divergences of the remaining 37 Attachment B items. In particular, the Delegation of Switzerland was of the view that the HS 1996 nomenclature was not the proper tool to address the issue of classification divergences in an efficient way, as that nomenclature had already been amended three times and it could not solve the difficulties that traders or customs officers faced in identifying the relevant tariff line for a specific ITA product. Switzerland therefore submitted a proposal to the Committee where it was suggested that the 2007 version of the HS be used to resolve divergences for the remaining 37 Attachment B items, since the HS 2007 was the nomenclature that most affected the ITA's product coverage. The Swiss proposal also suggested that participants used a document prepared by the WTO Secretariat describing the transposition of the ITA's product coverage into HS 2007 as a starting point to identify where they stood with respect to the classification of such items.

The Swiss proposal outlined a three-step procedure. First, the WTO Secretariat was asked to prepare a short and simple list for the remaining 37 Attachment B items and their possible classification in HS 2007. Second, ITA participants were required to indicate for which items their classification diverged from the list prepared by the WTO Secretariat, and the relevant HS 2007 subheading under which they classified the product in question. Third, the Secretariat was to compile all the answers received into one document that would be circulated to all participants and used as a basis to assess the next steps.

The ITA Committee adopted the Swiss proposal in October 2014 with the addition, suggested by India, that corresponding classifications in HS 2002 and HS 1996 would also be indicated for the 37 items in order to better assist participants in verifying the correctness of classification. In line with the Swiss proposal, the Secretariat circulated in December 2014 a background document,¹³ which included information on the relevant amendments to the HS nomenclature that affected the 37 items. Participants were asked to provide comments. As in the past, identifying the HS classification for the 37 Attachment B items was a complex task and required ITA participants to engage their respective customs authorities in order to identify the relevant HS codes and reach a decision by the Committee.

In 2016, the Committee received submissions from 13 ITA participants from which it emerged that there was no objection to the proposed HS 2007 classification of 15 Attachment B items. Most of these items related to HS heading 8486, which includes machines and apparatus for the manufacture of semiconductor boules or wafers, and HS heading 8471, which includes automatic data processing machines and units thereof. On this basis, the Committee was able to adopt in May 2016 the "Decision for the HS 2007 classification of 15 additional 'Attachment B' products".¹⁴ Also in the case of this decision, ITA participants were required to take the necessary steps to modify their WTO tariff schedules, if necessary, in order to reflect the agreed HS codes and to ensure that binding commitments on such products were properly recorded.

With these two decisions, the ITA Committee reached a common classification of 33 Attachment B items and is currently reviewing the remaining 22 items for which no agreement has yet been reached in order to achieve, where possible, a common classification in the existing HS nomenclature and fulfil the mandate in Paragraph 5 of the Annex to the Declaration.¹⁵

C. Work programme on non-tariff measures affecting trade in IT products

While the 1996 ITA mainly focused on the reduction and elimination of tariffs, Paragraph 3 of the Annex to the Ministerial Declaration on Trade in Information Technology Products also instructed the ITA Committee to hold consultations on non-tariff barriers to trade in IT products. In November 2000, the ITA Committee adopted a work programme on non-tariff measures (NTMs), in which it was agreed that "in parallel with tariff liberalization, there is a need to identify non-tariff

measures which adversely affect the expansion of trade in IT products and explore how the undue trade-distorting effects of such non-tariff measures could be reduced or eliminated". One of the main outcomes of the NTMs work programme was the adoption of the "Guidelines for Electromagnetic Compatibility (EMC) and Electromagnetic Interference (EMI) Conformity Assessment Procedures", which is addressed in Section D.

However, since the adoption of the work programme, participants have had different views of how to approach work on NTMs in the context of the ITA Committee. One influence on the Committee's work in this area was the ongoing discussions on NTMs in the context of non-agricultural market access (NAMA) negotiations, in which competing proposals had been submitted relating to barriers affecting the electronics sector.¹⁶ Another important factor was the link between discussions on NTMs in the Committee and the inclusion of possible new discipline on NTMs in the context of negotiations for the review of product coverage in which not all ITA participants were involved.¹⁷

During the 2012 symposium on the 15th Anniversary of the ITA, there was a strong call from some participants for work on NTMs to ensure "obstacle-free" trade in ITA products. At the ITA Committee meeting following the symposium, it was clarified that discussions on the review of product coverage and NTMs were no longer linked and that the Committee could continue to take steps to advance important work under the NTMs work programme. Similarly, a concept paper for the expansion of the ITA, which was circulated at that time at the request of some delegations, recognized that "Separately, the ITA Committee should take concrete steps to advance the important ongoing work under the Non-Tariff Measures (NTMs) Work Programme, to further facilitate international trade in this important sector".¹⁸

In the autumn of 2012, a group of 15 ITA participants kicked off discussions on how NTMs should be addressed in the ITA Committee with a view to building solid common ground on which to base concrete work and identify areas in which the Committee could make progress. The understanding was that interested participants would undertake brainstorming sessions to try to find proposals that were doable in the tradition of the Committee's work programme but not overly prescriptive.

From discussions, it emerged that participants had different views on how to proceed on NTMs. Some participants brought to the table new and concrete ideas, for example on transparency; others stressed the importance of completing ongoing work under the

existing work programme; still others recognised the necessity of consulting further with industry in order to grasp its needs in a more appropriate manner. On the latter question, Switzerland proposed the organization of an industry-driven workshop specifically on non-tariff barriers affecting trade in IT products, with the objective of identifying emerging issues that should be addressed in the ITA Committee. The Swiss proposal was supported by many delegations.

On 7 May 2015, the ITA Committee organized a "Workshop on non-tariff barriers affecting trade in ICT products", which was attended by almost 120 participants. The workshop provided a unique opportunity for ITA participants to reach out and interact with information and communications technology (ICT) industry representatives, the private sector, business associations and academics. The main issues raised by industry representatives included transparency in administrative requirements, standards for the recognition of test results, the complexity and trade restrictiveness of technical regulatory measures, e-labelling (see Box 3.1), energy efficiency, and the impact of these measures on small developing economies and small and medium-sized enterprises (SMEs). A factual report by the ITA Committee Chair summarizing the main conclusions and recommendations from the workshop is provided in Box 3.2.

As a follow-up to the NTBs workshop, the ITA Committee Chair started consultations with ITA participants with a view to examining the recommendations and avenues that were suggested by industry representatives on possible areas of work where the Committee could add value. In those consultations, emphasis was placed on the importance of transparency and standards for the recognition of test results, and there was also some interest in exploring e-labelling and energy efficiency. Conformity assessment procedures were also highlighted.

On 7 May 2015, the ITA Committee organized a "Workshop on non-tariff barriers affecting trade in ICT products", which was attended by almost 120 participants.

BOX 3.1 What is e-labelling?

Conformity marking is used to show that a product complies with regulatory requirements, including its safe use. But over time, as ICT devices have decreased in size and have come to be made from innovative new materials, it has become increasingly difficult to use conventional physical labels. The demand for additional conformity markings to reflect compliance with existing and developing national standards and regulations in more economies is driving the search for alternate solutions that better lend themselves to more and frequent changes. The physical limitations to accommodating this proliferation of printed compliance labels and information can lead to confusion among regulators and end-users.

The purpose of electronic labelling (e-labelling) is to allow manufacturers to electronically display regulatory conformity marking or other relevant information on ICT devices, rather than affixing it to a physical label on the product. There are several different e-labelling methods. One method is to use the product screen within the device to display the required information. Alternatively, the product screen may feature a link to a website that contains the necessary product markings and statements. Another method is the use of a machine-readable code (i.e. a Quick Response, or QR, Code), which allows a scanning device or smartphone to retrieve the product markings and statements when required. This latter system can be used with devices with or without integrated screens.

For example, information such as the US Federal Communications Commission identification number can be included as part of the software and displayed at start-up, or a softkey can be included to retrieve the information as needed. The e-label would be stored in the firmware to allow installers, users, or custom agents to quickly verify the certification.

In certain cases, a product may employ both e-labels and physical labels. For example, when customs officers do not want to turn on a device, or in economies where electricity is not always available, a device may also include a physical peel-off screen cover with relevant information.

However, some ITA participants expressed caution with regard to advancing regulatory work on NTMs. In their view, the needs and constraints of developing and least-developed economies in this area had to be properly considered. In addition, participants needed to ensure that the ITA Committee's work on NTMs remained proponent-driven and was pursued in a manner consistent with the discussion of NTMs in other contexts, such as NAMA negotiations or the ITA expansion. In light of the different positions, discussions on how the ITA Committee could advance work on NTMs are ongoing.

BOX 3.2 ITA-NTBs workshop: joint messages and concrete recommendations by the ICT industry – Factual report by the Chairman of the ITA Committee¹⁹

Throughout the workshop, speakers elucidated the ways in which NTBs can be trade-restrictive for the ICT sector. The lack of harmonization of globally used standards, for both administrative and technical regulations, creates many barriers to trade by significantly increasing the costs of compliance (e.g. duplication of testing and certification procedures) and by delaying market entry. The industry has been unanimous about these problems. Concrete recommendations have been made accordingly around the following principle:

For each area of certification (for example, electromagnetic compatibility, safety, telecom approvals, radio emission, and energy efficiency): one global product, one global standard, one global test, one global certificate.

Transparency

The establishment of a centralized database of administrative requirements (e.g. conformity assessment procedures) and technical requirements (e.g. standards) per area of certification (e.g. EMC, safety, radio, environment) per product and per country to solve the lack of transparency that characterizes the complexity of national technical and administrative requirements. Such a database should be evolutionary to reflect the constant evolution of technical requirements.

Conformity assessment procedures

1. In the area of electromagnetic compatibility (EMC), global recognition of the supplier's declaration of conformity (SDoC) to avoid the duplication of conformity assessment procedures.
2. In the area of safety of electrical and electronic components, equipment and products, the consideration of the IEC-IECEE-CB scheme as a basis to define a globally recognized standard with respect to test results.

E-labelling

Adopt the principle of e-labelling as a simple and efficient solution to the costly problem of the proliferation of marking requirements. Many countries have already endorsed e-labelling.

Others

1. Harmonize practices in the field of energy efficiency requirements.
2. Encourage global cooperation to avoid forced localization measures.

All speakers recognized that the general elimination of NTBs and the application of the above-mentioned recommendations would particularly benefit SMEs in developing countries. All speakers from developing countries advocated for more trade liberalization in the ICT sector.

D. Guidelines for electromagnetic compatibility (EMC) and electromagnetic interference (EMI) conformity assessment procedures

One of the main outcomes of the NTMs work programme was the completion of a pilot project that led to the adoption in 2005 of the "Guidelines for Electromagnetic Compatibility (EMC) and Electromagnetic Interference (EMI) Conformity Assessment Procedures".²⁰ Upon adoption of these guidelines, the WTO Secretariat

was instructed to compile information on the different types of conformity assessment on EMC/EMI on the basis of survey responses and notifications submitted by ITA participants. This information is contained in a Secretariat note,²¹ which is regularly updated. Table 3.1 shows the types of conformity assessment procedures for EMC/EMI used by 33 ITA participants.

ITA participants have found information on types of conformity assessment procedures for EMC/EMI very useful as, in their view, this information has helped increase transparency with regard to the procedures used thereby facilitating international trade in the sector.

Table 3.1: Types of conformity assessment on EMC/EMI notified to the ITA Committee

| EMC Type | Definition of conformity assessment type | Number of economies using the EMC type |
|----------|---|--|
| A | Certification by a regulator or delegated entity – the equipment has to be submitted to the regulator or its delegated entity for certification. | 3 |
| B | Certification by 3 rd party – the equipment has to be submitted to certification bodies recognized (or approved) by the regulator for certification. | 7 |
| C | Supplier's Declaration of Conformity (SDoC), type 1 – the supplier or manufacturer declares the equipment meets requirements. A testing laboratory recognized by the regulator tests the equipment and the supplier registers this equipment with the regulator. | 2 |
| D | Supplier's Declaration of Conformity (SDoC) type 2 – the supplier or manufacturer declares the equipment meets requirements on the basis of test reports by a testing laboratory recognized by the regulator. No registration of the equipment with the regulator is required. | 3 |
| E | Supplier's Declaration of Conformity (SDoC) type 3 – the supplier or manufacturer declares the equipment meets requirements. The supplier registers the equipment with the regulator. Testing of the equipment by recognized testing laboratory is not mandatory and additional laboratory testing choice rests with supplier or manufacturer. | None |
| F | Supplier's Declaration of Conformity (SDoC) type 4 – the supplier or manufacturer declares the equipment meets requirements. Registration with the regulator is not required and testing of the equipment by recognized testing laboratory is not mandatory and additional laboratory testing choice rests with supplier or manufacturer. If testing is undertaken, the choice of the testing laboratory rests with supplier or manufacturer. | 12 |
| G | No mandatory assessment procedure. | 6 |

Source: Official WTO document no. G/IT/W/17/Rev.17.

E. Review of product coverage

Paragraph 3 of the Annex to the ITA Declaration calls for its participants to meet periodically,

"to review the product coverage specified in the Attachments, with a view to agreeing, by consensus, whether in the light of technological developments, experience in applying the tariff concessions, or changes to the HS nomenclature, the Attachments should be modified to incorporate additional products".

The review of product coverage has always been a standing item on the agenda of the ITA Committee since its inception. However, since March 2000, the Committee has not undertaken any substantive work

on the review of product coverage. As there was less discussion on this item, sporadic reports made by interested delegations were put as an agenda item under the heading "Other business", with a standard statement by the Chair indicating that the issue continued to be under consultation and encouraging delegations to continue their efforts. At the Committee meeting of 15 May 2012, at the request of some delegations, the review of product coverage was re-included in the agenda so that delegations could report on their bilateral and plurilateral consultations on this issue. Since then, participants to the ITA expansion negotiations have regularly reported to the ITA Committee on the development of their negotiations in that context. See Chapter 4 for more information about the ITA expansion.

Endnotes

- 1 Paragraphs 3, 5, 6 and 7 of the Annex to the Declaration, WT/MIN/(96)/16 (available at https://www.wto.org/english/docs_e/legal_e/legal_e.htm).
- 2 See official WTO document no. G/L/160, available at <https://docs.wto.org/>
- 3 See page 91 for a full list of ITA participants as of 19 May 2017.
- 4 Decision of 26 March 1980, accessible via https://www.wto.org/gatt_docs/English/SULPDF/90970413.pdf
- 5 The status of implementation of the ITA can be consulted in WTO document no. G/IT/1/Rev.56 and subsequent revisions, available at <https://docs.wto.org/>
- 6 The two participants with pending procedures for incorporating ITA commitments in the schedules are El Salvador, which is awaiting domestic approval, and Morocco which is yet to start the 1980 Procedures.
- 7 In this context, reference is made to the dispute "EC-IT products", which concerned various measures of the European Union pertaining to the tariff classification, and consequent tariff treatment, of certain IT products. See WTO (2012), pages 27–28.
- 8 In the Secretariat note, Attachment B items were divided in four "lists". The lists were set out as follows: (1A) those items where divergences were narrowed to one classification option; (1B) those items where divergences were narrowed to two or more possible classifications, and agreement was reached with respect to these classifications; (2) those items where divergences were narrowed to two or more possible classifications, and there was not agreement on the classifications; (3) those items which were to be sent to the World Customs Organization (WCO) Harmonized System Committee (HSC); (4) those items where no further progress could be achieved due to a number of circumstances, and (5) those items referred to this formal Committee to be addressed. See official WTO document no. G/IT/W/6/Rev.3.
- 9 For further information on divergences in classification before 2013, see WTO (2012), Chapter 2, Section C.
- 10 See official WTO document no. G/IT/27, "Decision for the classification of certain Attachment B products".
- 11 See WTO official document no. G/IT/29, "Decision for the HS2007 Classification of 15 Additional 'Attachment B' Products".
- 12 See Annex Table 3.1 on the 2013 Decision with the HS 1996 codes for 18 Attachment B products.
- 13 See official WTO document no. G/IT/W/40: "Divergences of classification: Possible HS2007 Classification for the remaining 37 'Attachment B' items".
- 14 The Decision is contained in WTO official document no. G/IT/29. See Annex Table 3.2 for additional information on the 2016 Decision with the HS2007 codes for additional 15 Attachment B products
- 15 The 22 remaining Attachment B items for consideration by the Committee are listed in Annex Table 3.3.
- 16 See for instance official WTO document no. TN/MA/W/105/Rev.1, the "Negotiating Text on Non-Tariff Barriers Pertaining to the Electrical Safety and Electromagnetic Compatibility (EMC) of Electronic Goods".
- 17 See official WTO document no. G/IT/W/28, "Review of the Information Technology Agreement (ITA)".
- 18 See official WTO document no. G/IT/W/36, "Concept Paper for the Expansion of the ITA – Communication from Canada, Japan, Korea, the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu, Singapore and the United States". Costa Rica and Malaysia were subsequently added to the list of sponsors of the Concept Paper.
- 19 See official WTO document no. G/IT/28, "Workshop on non-tariff barriers affecting trade in ICT products – 7 May 2015 – Factual report by the Chairman under his own responsibility".
- 20 For further information on conformity assessment see WTO (2012), Chapter 2, Section E.
- 21 See official WTO document no. G/IT/W/17 and its subsequent revisions, "Draft List of the Types of Conformity Assessment Procedures for EMC/EMI used by ITA Participants".
- 22 On behalf of the customs union of Switzerland and Liechtenstein.

Annex 3.1

Annex Table 3.1: 2013 Decision for the HS 1996 classification of 18 “Attachment B” products

| ITA Item No. | Product description | HS 1996 code |
|--------------|---|--------------|
| 113 | Quartz reactor tubes and holders designed for insertion into diffusion and oxidation furnaces for production of semiconductor wafers | 702000 |
| 114 | Chemical vapour deposition apparatus for semiconductor production | 841989 |
| 115 | Parts of chemical vapour deposition apparatus for semiconductor production | 841990 |
| 125 | Lasercutters for cutting contacting tracks in semiconductor production by laser beam | 845610 |
| 126 | Machines for sawing monocrystal semiconductor boules into slices, or wafers into chips | 846410 |
| 141 | Apparatus for physical deposition by sputtering on semiconductor wafers | 854389 |
| 147 | Physical deposition apparatus for semiconductor production | 854389 |
| 148 | Spinners for coating photographic emulsions on semiconductor wafers | 847989 |
| 149 | Part of apparatus for physical deposition by sputtering on semiconductor wafers | 854390 |
| 151 | Parts for spinners for coating photographic emulsions on semiconductor wafers | 847990 |
| 158 | Parts of physical deposition apparatus for semiconductor production | 854390 |
| 162 | Apparatus for rapid heating of semiconductor wafers | 851430 |
| 164 | Parts of apparatus for rapid heating of wafers | 851490 |
| 181 | Pattern generating apparatus of a kind used for producing masks or reticles from photoresist coated substrates | 901720 |
| 182 | Parts and accessories for pattern generating apparatus of a kind used for producing masks or reticles from photoresist coated substrates | 901790 |
| 183 | Parts of such pattern generating apparatus | 901790 |
| 195 | Monitors: display units of automatic data processing machines with a cathode ray tube with a dot screen pitch smaller than 0.4 mm not capable of receiving and processing television signals or other analogue or digitally processed audio or video signals without assistance of a central processing unit of a computer as defined in this agreement. The agreement does not, therefore, cover televisions, including high definition televisions. | 847160 |
| 196 | Optical disc storage units, for automatic data processing machines (including CD drives and DVD-drives), whether or not having the capability of writing/ recording as well as reading, whether or not in their own housings. | 847170 |

Source: Official WTO document numbers G/IT/27, G/IT/W/30 and G/IT/W/6/Rev.3.

Annex Table 3.2: 2016 Decision for the HS 2007 classification of 15 additional “Attachment B” products

| ITA Item No. | Product description | HS 2007 code |
|--------------|--|--|
| 129 | Parts for machines for sawing monocrystal semiconductor boules into slices, or wafers into chips | 848690ex |
| 130 | Parts of dicing machines for scribing or scoring semiconductor wafers | 848690ex |
| 133 | Parts of lasercutters for cutting contacting tracks in semiconductor production by laser beam | 848690ex |
| 135 | Parts of apparatus for stripping or cleaning semiconductor wafers | 848690ex |
| 138 | Parts of encapsulation equipment | 848690ex |
| 139 | Automated machines for transport, handling and storage of semiconductor wafers, wafer cassettes, wafer boxes and other material for semiconductor devices | 848640ex |
| 143 | Die attach apparatus, tape automated bonders, and wire bonders for assembly of semiconductors | 848640ex |
| 144 | Encapsulation equipment for assembly of semiconductors | 848640ex |
| 150 | Parts for die attach apparatus, tape automated bonders, and wire bonders for assembly of semiconductors | 848690ex |
| 153 | Parts of apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays | 848690ex |
| 154 | Parts of automated machines for transport, handling and storage of semiconductor wafers, wafer cassettes, wafer boxes and other material for semiconductor devices | 848690ex |
| 155 | Parts of encapsulation equipment for assembly of semiconductors | 848690ex |
| 157 | Parts of machines for bending, folding and straightening semiconductor leads | 848690ex |
| 169 | Parts of apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays | 848690ex |
| 191 | Computers: automatic data processing machines capable of (1) storing the processing program or programs and at least the data immediately necessary for the execution of the program; (2) being freely programmed in accordance with the requirements of the user; (3) performing arithmetical computations specified by the user; and (4) executing, without human intervention, a processing program which requires them to modify their execution, by logical decision during the processing run. The agreement covers such automatic data processing machines whether or not they are able to receive and process with the assistance of central processing unit telephony signals, television signals, or other analogue or digitally processed audio or video signals. Machines performing a specific function other than data processing, or incorporating or working in conjunction with an automatic data processing machine, and not otherwise specified under Attachment A or B, are not covered by this agreement. | 847130 847141 847149 847150ex |

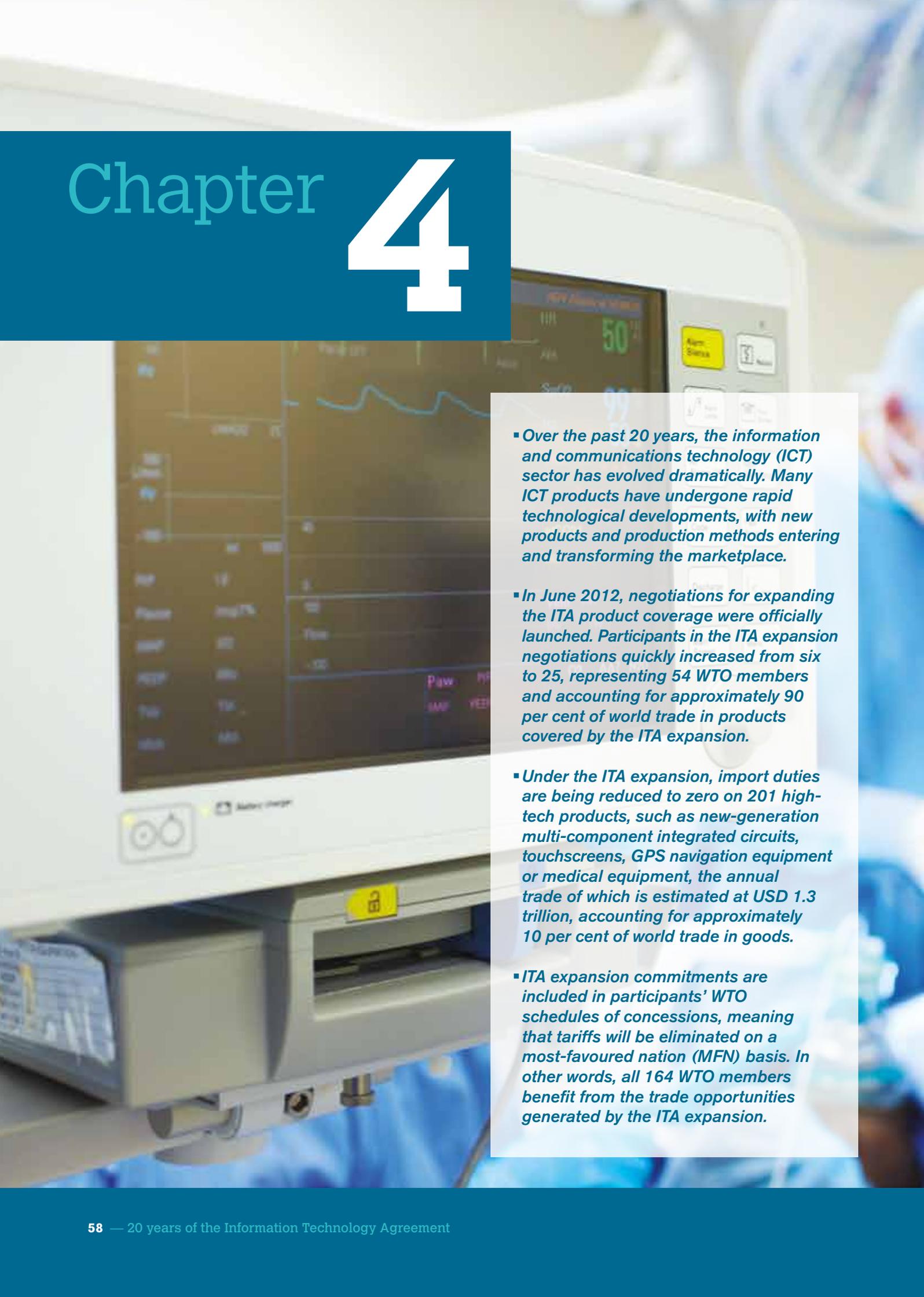
Source: Official WTO document numbers G/IT/29 and G/IT/W/6/Rev.3.

■ **Annex Table 3.3: “Attachment B” products with remaining classification divergences in HS 2007**

| ITA Item No. | Product description |
|--------------|---|
| 122 | Apparatus for stripping or cleaning semiconductor wafers |
| 137 | Encapsulation equipment for assembly of semiconductors |
| 142 | Apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays |
| 146 | Machines for bending, folding and straightening semiconductor leads |
| 166 | Wafer probers |
| 168 | Apparatus for wet etching, developing, stripping or cleaning semiconductor wafers and flat panel displays |
| 175 | Optical stereoscopic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or reticles |
| 176 | Photomicrographic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or reticles |
| 177 | Parts and accessories of optical stereoscopic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or reticles |
| 178 | Parts and accessories of photomicrographic microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or reticles |
| 179 | Electron beam microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or reticles |
| 180 | Parts and accessories of electron beam microscopes fitted with equipment specifically designed for the handling and transport of semiconductor wafers or reticles |
| 192 | Electric amplifiers when used as repeaters in line telephony products falling within this agreement, and parts thereof |
| 193 | Flat panel display devices (including LCD, Electro Luminescence, Plasma, Vacuum-Fluorescence and other technologies) for products falling within this agreement, and parts thereof. |
| 194 | Network equipment: Local Area Network (LAN) and Wide Area Network (WAN) apparatus, including those products dedicated for use solely or principally to permit the interconnection of automatic data processing machines and units thereof for a network that is used primarily for the sharing of resources such as central processor units, data storage devices and input or output units – including adapters, hubs, in line repeaters, converters, concentrators, bridges and routers, and printed circuit assemblies for physical incorporation into automatic data processing machines and units thereof. |
| 197 | Paging alert devices, and parts thereof |
| 198 | Plotters whether input or output units of HS heading No. 8471 or drawing or drafting machines of HS heading No. 9017. |
| 199 | Printed Circuit Assemblies for products falling within this agreement, including such assemblies for external connections such as cards that conform to the PCMCIA standard. Such printed circuit assemblies consist of one or more printed circuits of heading 8534 with one or more active elements assembled thereon, with or without passive elements "Active elements" means diodes, transistors, and similar semiconductor devices, whether or not photosensitive, of heading 8541, and integrated circuits and micro assemblies of heading 8542. |
| 200 | Projection type flat panel display units used with automatic data processing machines which can display digital information generated by the central processing unit. |
| 201 | Proprietary format storage devices including media therefor for automatic data processing machines, with or without removable media and whether magnetic, optical or other technology, including Bernoulli Box, Syquest, or Zipdrive cartridge storage units |
| 202 | Multimedia upgrade kits for automatic data processing machines, and units thereof, put up for retail sale, consisting of, at least, speakers and/or microphones as well as a printed circuit assembly that enables the ADP machines and units thereof to process audio signals (sound cards). |
| 203 | Set top boxes which have a communication function: a microprocessor based device incorporating a modem for gaining access to the Internet, and having a function of interactive information exchange. |

Source: Official WTO document numbers G/IT/W/40/Suppl.2 and G/IT/W/6/Rev.3.

Chapter 4

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- *Over the past 20 years, the information and communications technology (ICT) sector has evolved dramatically. Many ICT products have undergone rapid technological developments, with new products and production methods entering and transforming the marketplace.*
 - *In June 2012, negotiations for expanding the ITA product coverage were officially launched. Participants in the ITA expansion negotiations quickly increased from six to 25, representing 54 WTO members and accounting for approximately 90 per cent of world trade in products covered by the ITA expansion.*
 - *Under the ITA expansion, import duties are being reduced to zero on 201 high-tech products, such as new-generation multi-component integrated circuits, touchscreens, GPS navigation equipment or medical equipment, the annual trade of which is estimated at USD 1.3 trillion, accounting for approximately 10 per cent of world trade in goods.*
 - *ITA expansion commitments are included in participants' WTO schedules of concessions, meaning that tariffs will be eliminated on a most-favoured nation (MFN) basis. In other words, all 164 WTO members benefit from the trade opportunities generated by the ITA expansion.*

ITA expansion

A. Early efforts to expand the product coverage of the 1996 ITA

Since the Internet became available to the general public in the middle of the 1990s, the information and communications technology (ICT) sector has arguably become the most dynamic sector in the global economy.¹ The widespread use of technology has improved productivity, generated economic growth, created new jobs, including specialized ICT jobs across all sectors of the economy,² and improved quality of life. With rapid changes in technology and in trade flows, new ICT products enter the market every day.

When they signed the ITA in 1996, its participants agreed to meet periodically to review the product coverage specified in its attachments “with a view to agreeing, by consensus, whether in the light of technological developments, experience in applying the tariff concessions, or changes to the HS nomenclature, the attachments should be modified to incorporate additional products”.³

The review of product coverage under the 1996 ITA – known as the “ITA II” negotiations – began at the same time as the entry into force of the ITA in 1997 but stalled at the end of 1998 when participants were unable to find consensus on the products to be added to the existing list. Because of this, the original product annexes of the 1996 ITA Declaration have not yet been updated.⁴

Since the Internet became available to the general public in the middle of the 1990s, the information and communications technology sector has arguably become the most dynamic sector in the global economy.

B. Calls for the expansion of the ITA in May 2012

On 2 May 2012, six ITA participants – Canada, Japan, the Republic of Korea, Singapore, Chinese Taipei and the United States – submitted a “Concept Paper for the Expansion of the ITA” to the ITA Committee.⁵ The paper was later co-sponsored by Costa Rica and Malaysia and endorsed by the European Union⁶ (see Box 4.1).

The concept paper recognized that the 1996 ITA was “tremendously successful in facilitating increased global trade and investment, encouraging information and communications technology (ICT) adoption, and reducing the cost of ICT inputs”. At the same time, it acknowledged that “Many ICT products have experienced rapid technological development, with new products

BOX 4.1 Concept paper for the expansion of the ITA⁷

The concept paper stated that “[i]n order to make the ITA more comprehensive, recognizing changes in patterns of global ICT trade and production and the pace of technological innovation in the industry”, negotiations should commence promptly, on the following basis:

- Expand the product coverage of the ITA; and
- Seek to include non-signatory IT producers in the ITA.”

The paper also highlighted the following points:

- “ITA Participants should begin negotiations promptly, with a view to rapid conclusion and implementation. A successful expansion of ITA product coverage, concluded in the near-term, would provide a much-needed boost to the global economy, and reinforce the importance of the multilateral trading system.
- ITA Participants should accelerate consultations with domestic stakeholders to grasp their needs for the expansion of the product coverage. Examples of key categories of products that could be covered by the ITA include: a) products capable of processing digital signals; b) products that can send or receive digital signals with or without lines; c) ICT manufacturing equipment; and d) related components, attachments, and parts. [...]
- Separately, the ITA Committee should take concrete steps to advance the important ongoing work under the Non-Tariff Measures (NTMs) Work Programme, to further facilitate international trade in this important sector.”

and production methods entering and transforming the marketplace". The paper noted that "products that existed at the time the ITA was negotiated but were not included account for a growing share of ICT trade" and that "despite significant changes to the HS system [i.e the Harmonized System, an international nomenclature arranged in six-digit codes, allowing all participating economies to classify traded goods on a common basis] in 2002, 2007, and 2012 that better reflect technological development, product coverage under the ITA has never been expanded".

The paper further acknowledged industry's advocacy role in driving Asia-Pacific Economic Cooperation (APEC) leaders to agree in November 2011 to "play a leadership role in launching negotiations to expand product coverage and membership of the ITA". Indeed, the global ICT industry played an instrumental role in launching the ITA expansion negotiations, as it did for the negotiations of the 1996 ITA.⁸ In 2011 and 2012, several ICT associations – the US-based Information Technology Industry Council (ITI), DIGITALEUROPE and the Japanese Electronic Industry Development Association (JEIDA) – urged their respective governments to give priority to start negotiations to expand the ITA product coverage on several occasions, such as at the APEC Leaders' Meeting in November 2011 and the World Electronics Forum in January 2012. In a statement issued by DIGITALEUROPE on 23 February 2012, it was reaffirmed that "the ITA needs to be expanded to keep pace with technological change and help eliminate uncertainty that arises as convergence in the ICT industry continues to advance".⁹

On 14-15 May 2012, on the occasion of the WTO Symposium celebrating the 15th anniversary of the ITA, repeated calls were made to expand the ITA product coverage and to update the 1996 ITA in order to take technological developments into account.

C. ITA expansion negotiations

On 1 June 2012, six ITA participants – Costa Rica, the European Union, Japan, the Republic of Korea, Chinese Taipei and the United States – officially launched the ITA expansion negotiations. When the negotiations were concluded on 16 December 2015 at the Tenth WTO Ministerial Conference in Nairobi, Kenya, the ITA expansion included 24 participants (counting the European Union as one participant), representing 53 WTO members.¹⁰

Actual negotiations of the ITA expansion took place among interested parties in the form of a Technical Working Group (TWG). The TWG held rounds of

On 1 June 2012, six ITA participants – Costa Rica, the European Union, Japan, the Republic of Korea, Chinese Taipei and the United States – officially launched the ITA expansion negotiations.

negotiations which were hosted by rotation in some participants' permanent missions in Geneva. The role of the hosting chair in each ITA expansion negotiating round was very important, as it was responsible for the whole organization of meetings, facilitation of discussions, circulation of documents and follow-up.¹¹

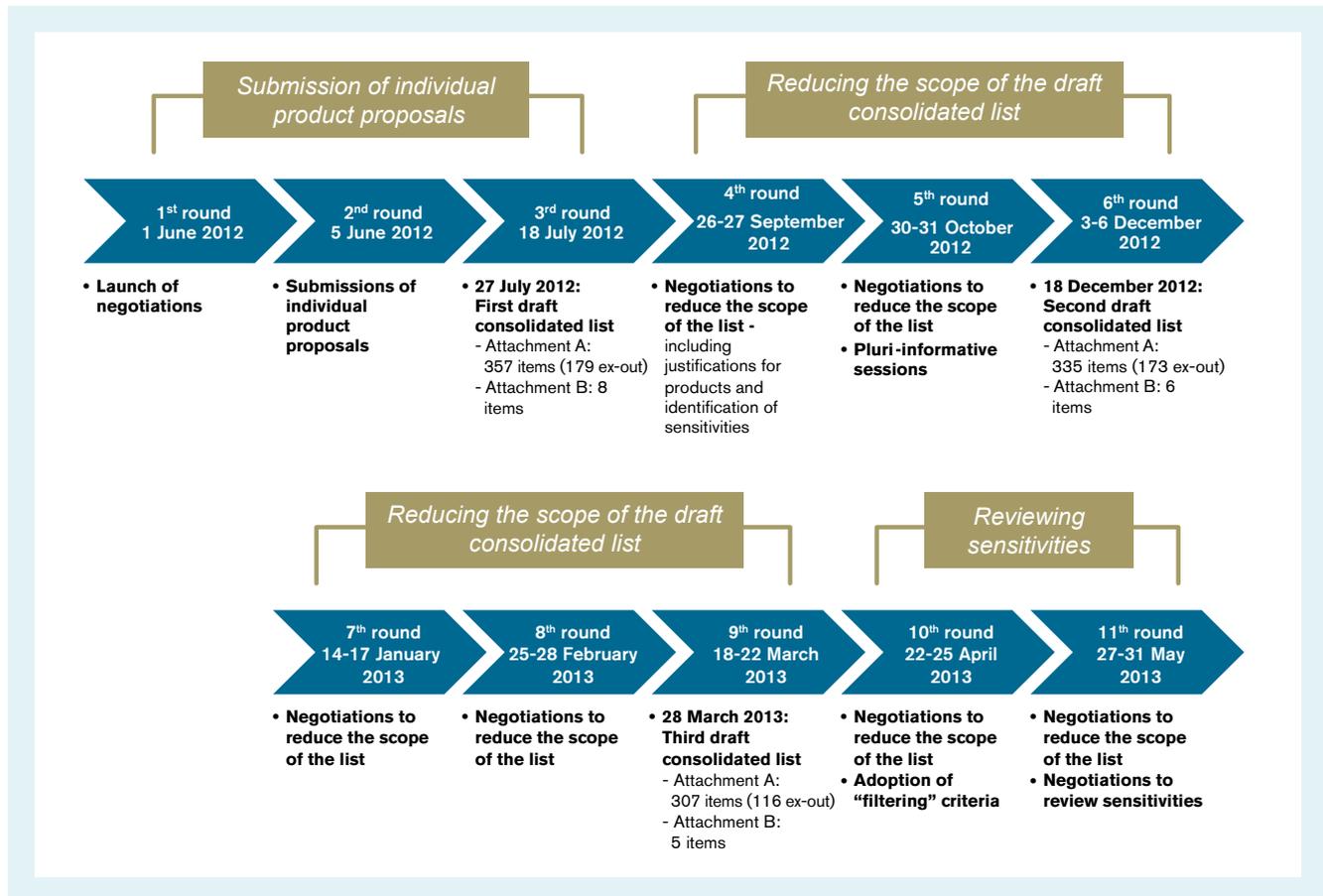
The TWG process lasted three and a half years, and went through three main phases: i) submission of proposals for product inclusion; ii) negotiations on "product coverage" for the formation of the final list, including the identification of sensitivities; and iii) negotiations on staging and the plurilateral review and approval of ITA expansion schedules.

The ITA expansion builds on the 1996 ITA but stands on its own as a separate agreement. This is due to the fact that ITA expansion was negotiated and agreed by a subset of participants of the 1996 ITA. Thus, negotiations were held outside the ITA Committee. Nevertheless, ITA expansion participants periodically reported to the ITA Committee under the agenda item "Review of product coverage", as per paragraph 3 of the Annex to the 1996 Ministerial Declaration. The ITA expansion is open to all ITA participants and other WTO members who wish to join it.

Submission of proposals for products inclusion under the ITA expansion

Like the 1996 ITA, ITA expansion negotiations were plurilateral and sector-specific. As illustrated in Figure 4.1, the initial phase of negotiations started with the submission by each participant of products proposed for inclusion under the new agreement and their justification. After the first three rounds of negotiations, in July 2012 the group was able to compile a first draft consolidated working list of products, which consisted of two parts:

Figure 4.1: Timeline ITA expansion negotiations – Phase 1: Submission of product proposals and formation of the ITA expansion list



Source: WTO Secretariat.

"Attachment A", containing more than 357 items defined at the HS sub-heading level (i.e. 6-digit), of which 179 HS sub-headings were partially covered ("ex-outs");¹² and "Attachment B" including eight product descriptions.¹³

The first draft ITA expansion list contained many new ICT products – such as high-tech medical devices; measuring instruments; navigation equipment; ICT manufacturing equipment, machinery and components; simulators; semiconductor and related equipment; multi-component integrated circuits (MCOs); etc. In response to concerns expressed by some participants over the level of ambition of the first list, the group, at its fourth round of negotiations, started to review the draft list with a view to reducing its scope and entered into a more in-depth discussion on the relevant justifications. In order to facilitate the process, the TWG organized a series of "pluri-informative sessions" which provided an opportunity for the proponents, including their private sector representatives on some occasions, to present and explain their proposals and provide justifications for the proposed inclusion of specific products.

From the beginning of 2013, the group's main objective was to reduce the list by removing some items with low levels of support or with questionable relevance to the ICT sector and start identifying sensitive products. Examples of products that were removed from the negotiating list in these early rounds include household appliances and cables. In this context, the group agreed to use the "filtering" criteria proposed by the European Union, whereby products would remain on the negotiating list if they met one of two thresholds of support, namely: i) the proponents had to account for at least 50 per cent of world trade in that product; or ii) the inclusion of that product had to be supported by eight or more participants. The acceptance of these negotiating criteria launched an intensive phase of negotiations among the participants, who began to engage in trade-offs to build levels of support for key priorities, and peel off support for key sensitivities. During this phase, the WTO Secretariat was asked to assist the group, and it prepared the data required for the filtering exercise (see Box 4.2).

BOX 4.2 The role of the WTO Secretariat in the ITA expansion negotiations

Unlike traditional WTO negotiations, ITA expansion negotiations were conducted by a sub-group of members in an independent and informal manner. The ITA expansion participant in charge of hosting the round of negotiations was also responsible for the organization of meetings, circulation of documents and follow-up.

In this setting, the WTO Secretariat was invited to attend some meetings of the TWG as an “observer” since September 2012. Its main role in the negotiations was to provide, upon request of the ITA expansion participants, technical support in the different phases of negotiations, including with the provision of trade and tariff data, preparation of ITA expansion schedules and verification of concessions.

For example, in 2013 the WTO Secretariat was asked by the TWG to prepare the trade data at the tariff line level for the “filtering” exercise and to keep the list up to date during the negotiations. During the last phase of negotiations, ITA expansion participants agreed to involve the WTO Secretariat more actively, particularly with the preparation of ITA expansion schedules (see Annex Figure 4.1 for more details on ITA expansion schedules). The Secretariat also provided substantive support to the TWG during the plurilateral review process, where the draft ITA expansion schedules were verified and reviewed multiple times to make sure that they did not have technical errors before participants could approve them by consensus and reach a final agreement.

Since the conclusion of the ITA expansion negotiations on 16 December 2015, the WTO Secretariat has assisted ITA expansion participants to fulfil their obligations to reflect the newly agreed concessions in their respective WTO schedules in accordance with the 1980 Procedures for the Modification and Rectification of Schedules, thereby ensuring that ITA expansion commitments are legally binding and are applied on an most-favoured nation (MFN) basis to all WTO members. The Secretariat has further provided technical assistance to WTO members wishing to join the ITA expansion, including the preparation of new participants' schedules.

The most important and difficult task faced by the group at this juncture was how to reach a balance of interests in the final list, while focusing on identifying top priorities, top sensitivities, and solutions for how to deal with them. At that time, the most sensitive items being identified were televisions (TVs), audio-video equipment, printing inks, chemicals, electrical apparatus (due to their multiple use in sectors other than the ICT), liquid-crystal display (LCD) panels, machine tools (due to their multiple use), optical fibres, multi-chip integrated circuits (MCPs), MCOs and light-emitting diode (LED) lighting.

With respect to sensitive products, three options were discussed: i) the removal of items from the list; ii) the creation of “ex-outs” to reduce the scope of the concession; and iii) longer implementation periods for the tariff reduction. In March 2013, the group circulated a third revision to the draft consolidated working list.¹⁴ While some important progress was made in streamlining the list, participants could not arrive at an agreement due to some members' insistence on the removal of identified sensitivities from the scope of coverage.

Negotiations on product coverage

The second phase of the ITA expansion negotiations was extremely difficult and experienced a number of suspensions (see Figure 4.2). The first major difficulty which delayed the circulation of the draft final list after the application of the “filtering” criteria was whether or not TVs, which were sensitive products for at least one major player, qualified for inclusion in the list (see Box 4.3). After extensive negotiations between the parties concerned, a revised, non-binding draft final ITA expansion list was eventually circulated on 26 June 2013, where the number of Attachment A items was reduced to 256 subheadings – 82 with partial coverage – and the number of Attachment B products was limited to six items.

With the circulation of the draft final list, the ITA expansion negotiations entered a new phase and participants intensified discussions with a view to addressing the treatment of sensitive products. As a means of resolving some of these sensitivities, the group agreed to negotiate staging modalities instead of requests for the removal of products from the list. Up until that point, a main challenge for participants was the lack of clarity on staging timeframes that could be used to accommodate their sensitivities.

At a meeting on 28 June 2013, the participants agreed to use the practice under the 1996 ITA as the modality for implementation timeframes for tariff elimination under the new agreement. Similar to the 1996 ITA, the group decided not to include general provisions on special and differential treatment among participants or to allow for exceptions to the final product coverage. Three-year staging in four equal annual reductions was to be applied as “standard” staging, with the possibility for extended staging for individual participants based on their sensitivities to be considered on a product-by-product basis. The participants further agreed that extended staging should not go beyond five years, with six equal annual reductions, though longer staging up to a maximum of seven years could be considered in exceptional circumstances and for highly sensitive products.

Figure 4.2: Timeline ITA expansion negotiations – Phase 2: Negotiations on product coverage



Source: WTO Secretariat.

Despite the progress on staging, the differences within the group on the general level of ambition and the difficulties linked to sensitive products led to the suspension of negotiations in July 2013, when some key participants argued that the list of sensitivities tabled by China was too long, covering roughly 150 products and excluding 106 out of the 256 products included in the draft negotiating list.¹⁵ Talks were restarted in October 2013 and China, the European Union, Japan and the United States held several meetings and consultations throughout the month in an effort to move negotiations forward. However,

in November 2013 the deadlock continued and the Group failed to meet its goal of reaching a deal in time for the Ninth WTO Ministerial Conference in Bali.

Another major difficulty at that time was whether a final agreement should include products such as LCD panels and machine tools. The situation was further complicated by the continuation of the “TV impasse” (see Box 4.3), which was also being used to leverage for support for the inclusion of machine tools.

After almost a year-long suspension, a bilateral breakthrough between the United States and China was reached on the margins of the APEC Summit in Beijing on 10 November 2014, which paved the way for negotiations in Geneva to resume on 4 December 2014. However, four days later, the process faced another deadlock as the agreement reached among key players was not accepted by other participants which considered that some of their key priority products, such as LCD panels and machine tools, had not been included. Moreover, the position of one of the major players was that negotiations on product coverage and staging should be conducted at the same time. Hence, negotiations were suspended until mid-2015.¹⁶

During this period, the WTO Director-General, Roberto Azevêdo, was asked to step in and provide his “good offices” to facilitate a deal. From the end of 2014 and throughout the first half of 2015, Director-General Azevêdo conducted many bilateral and plurilateral consultations with key negotiating parties and held a number of meetings with a view to bridging differences (see Box 4.4).

BOX 4.3 The “TV impasse”

The inclusion or exclusion of TVs (HS 852872) was a difficult issue in the ITA expansion negotiations. For some participants, expanding the coverage to TVs was a logical consequence of technological development and product integration; for others, TVs were sensitive items and they could not accept their inclusion in the negotiating list. In May 2013, TVs were not included in the draft list, as the share of trade in this item was 32.1 per cent and supporters included only six participants. Thus, according to the “filtering” proposal (i.e. 50 per cent or more of world trade or eight or more supporters), TVs did not qualify for inclusion. However, the situation changed dramatically on 14 June 2013 when a major player, whose share in world trade for this item was 16.4 per cent joined the supporters for inclusion of TVs. Consequently, the total share increased to 51.9 per cent and TVs was entered in the draft consolidated list. However, given the strong differences of view on TVs, in the end participants accepted the exclusion of TVs from the ITA expansion.

BOX 4.4 The Director-General's involvement during the process of the ITA expansion negotiations

In the ITA expansion negotiations, especially during the second stage of the TWG process, involvement by Director-General Roberto Azevêdo was requested by the group with a view to bridging the differences on several occasions. For example, on 12 December 2014, the group, after almost ten days of negotiations, was deadlocked again over the scope of product coverage, particularly on whether or not to include LCD display panels in the list. The Director-General was therefore asked to provide his good offices in an effort to unblock the stalemate. From 16 December 2014 onward, the Director-General conducted many bilateral and plurilateral consultations with key delegations and held meetings throughout the first half of 2015 with a view to resolving the deadlock.

Even at the very final stage of negotiations on product coverage, the DG's intervention on 18 July 2015 was crucial in resolving the disagreement between the European Union, China, and the United States over the issue of car radios, and this allowed the negotiations on product coverage to be successfully concluded.

At the request of participants, the DG was also directly involved in closing the text of the ITA expansion Ministerial Declaration, including, for example, by helping to bridge differences regarding the issue of critical mass at the Tenth WTO Ministerial Conference itself, an issue that remained outstanding for several months in the Geneva process.

On 14-17 July 2015, the TWG resumed discussions on product coverage at the EU Mission to the WTO in Geneva. During that week, the group met at the technical and ambassador level ¹⁷ with the support of capital-based experts in order to finalize the list of products to

be covered and the text of the ITA expansion Declaration, which laid out the terms of the agreement and the commitments to be undertaken by the participants.

Finally, after 17 rounds of negotiations, on 18 July 2015 a breakthrough on product coverage was found with the support of the Director-General. At the General Council meeting of 28 July 2015, the European Union, on behalf of the participants to the ITA expansion, announced that the group had reached an agreement on the "Declaration on the Expansion of Trade in Information Technology Products" ¹⁸ (hereafter the "July Declaration") as well as on the list of 201 products which was attached to the Declaration (see Box 4.5).

Negotiations on staging, including verification and approval of schedules

The July 2015 Declaration provided a detailed roadmap for completing the remaining part of the negotiations. During this phase, each participant had to submit its detailed schedule of concessions, including the specific implementation timeframes for each product, by the end of October 2015 so that the schedules of all participants could be reviewed and approved by consensus by 4 December 2015 (see Figure 4.3). ¹⁹ The objective of the ITA expansion participants was to announce the conclusion of the deal at the Tenth WTO Ministerial Conference in Nairobi, held from 15-18 December 2015.

Scheduling ITA expansion concessions was a complex technical exercise and the group requested the WTO Secretariat's assistance for the preparation and verification of schedules before they were officially submitted for review and approval by the group (see Annex 4.1).

Figure 4.3: Timeline ITA expansion negotiations – Phase 3: Staging negotiations

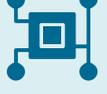
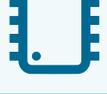


Source: WTO Secretariat

BOX 4.5 The ITA Expansion Declaration of 28 July 2015 ²⁰

- **Participants:** 25 participants, i.e. Albania; Australia; Canada; China; Costa Rica; the European Union; Guatemala; Hong Kong, China; Iceland; Israel; Japan; Korea; Malaysia; Montenegro; New Zealand; Norway; Philippines; Singapore; Switzerland; the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu; Thailand; and the United States. Colombia, Mauritius and Turkey, which participated in the negotiations, joined the Declaration a few days later.
- **Product coverage:** 201 products in total, divided into two attachments. Attachment A contains 191 items defined at the HS 2007 six-digit level, of which 50 items are partially covered (“ex-out”). Attachment B contains 10 items defined by product description (without HS code). The expansion list includes a wide range of IT-related products, from medical devices to audio-visual products, new generation semi-conductors, GPS navigation equipment, smart cards, optical media and others (see Table 4.1).
- **Commitment to bind and eliminate customs duties and other charges** (within the meaning of Article II.1(b) of the GATT 1994) on all products covered.
- **Implementation of tariff reductions:** Regular staging of three years (1 July 2016-1 July 2019), with four equal tariff reductions. Possibility of longer staging – up to five or maximum seven years for sensitive products. Other duties and charges, as defined by GATT Article II:1(b), to be eliminated upon entry into force.
- **Scheduling time-frame:** tariff reduction commitments were presented in a schedule format. ITA expansion schedules were plurilaterally reviewed and approved between October and December 2015. Once the schedules were approved, these were submitted under the 1980 “Procedures for Modification and Rectification of Schedule” in order to reflect the ITA expansion concessions in the WTO schedules of respective members.
- **Critical mass:** ITA expansion participants must represent approximately 90 per cent of world trade in the product covered in order to start implementing the agreement.
- **Non-tariff barriers:** intensify consultations with a view to a possible development of an up-graded work programme.
- The ITA expansion Declaration is **open for acceptance** by all WTO members.

Table 4.1: Examples of finished products and parts and accessories covered by the ITA expansion

| | | | |
|---|---|---|---|
|  | • Electronic devices (TV-cameras, video recording, digital car radios, set top boxes) |  | • Medical equipment (scanners, machines for magnetic resonance imaging, tomography or dental care and ophthalmology) |
|  | • Video games and consoles |  | • Loudspeakers, microphones and headphones |
|  | • Audiovisual/multimedia (GPS, DVD players, smart cards, optical media) |  | • Telecommunication satellites |
|  | • Multifunctional printing and copying machines, ink cartridges |  | • Parts and components for production of IT goods and semiconductors (e.g. lasers, LED modules, touch screens, measuring and weighing instruments, switches, electromagnets, amplification apparatuses, etc.) |
|  | • Multicomponent integrated circuits (MCOs) |  | • Machinery for production of IT goods and semiconductors |
|  | • Multichips (EIC) |  | • Machine tools for the manufacture of printed circuits or semiconductors and other IT products |

Source: WTO Secretariat.

Staging negotiations

Parallel to the preparation of schedules, participants also engaged in negotiations on staging for the 201 products included in the agreement. As mentioned previously, some staging negotiations had already taken place for certain sensitive products as part of the final negotiations on product coverage, including as trade-offs to reduce sensitivities. While the three-year rule for staging was agreed for non-sensitive products, largely following the practice of the 1996 ITA, participants also needed to specify the extended timeframes for identified sensitivities.²¹ At the same time, some participants proposed to accelerate the tariff elimination of a number of products with relatively low customs duties and products identified as “building blocks”²² for the ICT sector, which included tariff lines partially covered by the 1996 ITA,²³ as well as newly covered products such as advanced MCO semiconductors.

Agreeing on longer implementation periods for sensitive items was the most contentious issue of the staging negotiations. Some participants sought to limit the number of sensitive products subject to longer implementation periods and argued against longer staging for products not previously identified as sensitive.²⁴ Other participants sought to avail themselves of longer staging for all tariff lines previously identified as sensitive.

Following the submission of draft ITA expansion schedules, the group started the verification process on 9 November 2015. This process proved to be laborious, as it was common for the same draft schedule to be reviewed multiple times before it could be accepted by the group on a consensus basis. By the deadline of 4 December 2015, all 25 ITA expansion participants had submitted their draft schedules for review by the TWG. Of these, 15 draft schedules had been approved and ten remained pending.²⁵ Among the 10 pending draft ITA expansion schedules, some had “technical reservations”, meaning that there were some technical issues identified by the WTO Secretariat and/or raised by participants that needed to be corrected (for example tariff classification issues, consistency of information, editorial mistakes, etc.), while other schedules had both technical and “systemic reservations” based on staging that could only be solved through further negotiations.

The “systemic” reservation placed on the draft schedules of six participants was mainly due to the fact that these participants were considered major players in the trade of ITA expansion products and they were expected to improve their offers for staging, in terms of both extended staging for sensitive items

as well as requests for immediate tariff elimination for non-sensitive products. In light of this situation, the group was not able to approve the draft ITA expansion schedules of the six participants in Geneva and negotiations aimed at removing the reservations continued at the WTO Ministerial Conference in Nairobi.

D. The Nairobi Ministerial Declaration on ITA expansion

On 16 December 2015, the group eventually agreed in Nairobi to remove the reservations on the six remaining schedules and approved them by consensus (see Table 4.2).²⁶ Some final differences regarding the text of the Declaration were also solved. The conclusion of the ITA expansion negotiations was announced on 16 December 2015 during a ministerial press conference held at the margins of the Tenth WTO Ministerial Conference.

The Ministerial Declaration on the Expansion of Trade in Information Technology Products²⁷ (hereafter the ITA Expansion Ministerial Declaration) was issued by the Ministers of 24 ITA expansion participants, representing 53 WTO members, endorsing the results of the review process as reflected in the draft ITA expansion schedules submitted by each participant, which had been reviewed and approved on a consensus basis (see Table 4.2).²⁸ The ITA Expansion Ministerial Declaration acknowledged that, in accordance with the criteria established in paragraph 7 of the July Declaration, the approved draft ITA expansion schedules of the 24 participants represented approximately 90 per cent of the world trade in the products covered and, therefore, each participant would “implement the tariff elimination commitments as set forth in paragraphs 3 and 6 of the [July] Declaration and the approved schedules subject to the completion of domestic procedural requirements”.²⁹

The conclusion of the ITA expansion negotiations was announced on 16 December 2015 during the Tenth WTO Ministerial Conference.

Table 4.2: List of approved draft ITA expansion schedules during the review process

| Participant | Date of approval | Circulated in official WTO document |
|--|------------------|--|
| Albania | 3 December 2015 | G/MA/W/117/Add.1 |
| Australia | 9 December 2015 | G/MA/W/117/Add.2 |
| Canada | 16 December 2015 | G/MA/W/117/Add.3 |
| China | 16 December 2015 | G/MA/W/117/Add.4 G/MA/W/117/Add.4/Rev.1 |
| Colombia | 3 December 2015 | G/MA/W/117/Add.5 |
| Costa Rica | 12 November 2015 | G/MA/W/117/Add.6 G/MA/W/117/Add.6/Rev.1 |
| European Union | 16 December 2015 | G/MA/W/117/Add.7 |
| Guatemala | 3 December 2015 | G/MA/W/117/Add.8 |
| Hong Kong, China | 19 November 2015 | G/MA/W/117/Add.9 |
| Iceland | 19 November 2015 | G/MA/W/117/Add.10 |
| Israel | 3 December 2015 | G/MA/W/117/Add.11 |
| Japan | 13 November 2015 | G/MA/W/117/Add.12 |
| Republic of Korea | 16 December 2015 | G/MA/W/117/Add.13 G/MA/W/117/Add.13/Rev.1 |
| Malaysia | 1 December 2015 | G/MA/W/117/Add.14 |
| Mauritius | 3 December 2015 | G/MA/W/117/Add.15 |
| Montenegro | 10 November 2015 | G/MA/W/117/Add.16 |
| New Zealand | 7 December 2015 | G/MA/W/117/Add.17 |
| Norway | 12 November 2015 | G/MA/W/117/Add.18 |
| Philippines | 8 December 2015 | G/MA/W/117/Add.19 |
| Singapore | 19 November 2015 | G/MA/W/117/Add.20 |
| Switzerland-Liechtenstein | 13 November 2015 | G/MA/W/117/Add.21 |
| The Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu | 16 December 2015 | G/MA/W/117/Add.22 |
| Thailand | 9 December 2015 | G/MA/W/117/Add.23 |
| United States | 16 December 2015 | G/MA/W/117/Add.24 |

Source: WTO Secretariat.

The ITA Expansion Ministerial Declaration also welcomed any WTO member which was not a party to the ITA expansion to notify the WTO Director-General of its acceptance to undertake the commitments in the Declaration and become a participant. Since then Macao, China decided to join the ITA expansion and became the 25th participant on 9 December 2016.

In order to duly reflect the concessions resulting from the Declaration in their WTO schedules, all ITA expansion participants agreed to follow the 1980 Procedures for the Modification and Rectification of Schedules. By 9 June 2017, 23 ITA expansion participants have submitted modifications to their WTO schedules in accordance with the 1980 Procedures, and the ITA

expansion schedules of 18 participants have already been certified by the Director-General.³⁰ The others are waiting for the completion of domestic producers before starting the 1980 Procedures leading to certification.

E. Tariff and trade data of the ITA expansion

The ITA expansion requires its participants to bind and reduce tariffs to zero over a transitional period starting on 1 July 2016 and concluding on 1 July 2019 for the vast majority of tariff lines covered by the agreement. In some exceptional cases, duties will be completely removed after five or seven years.

The ITA expansion requires its participants to bind and reduce tariffs to zero over a transitional period starting on 1 July 2016 and concluding on 1 July 2019.

Figure 4.4 shows the average base duty, that is the starting point for tariff reduction, and the percentage of duty-free tariff lines across the full implementation period (i.e. 2016-2024). Before entry into force, the average base duty of ITA expansion participants on all tariff lines covered under both Attachments A and B was 9 per cent, and 49 per cent of these lines were already duty-free. Upon entry into force of the ITA expansion on 1 July 2016, tariffs were cut by one-third and reached 6 per cent on average.³¹

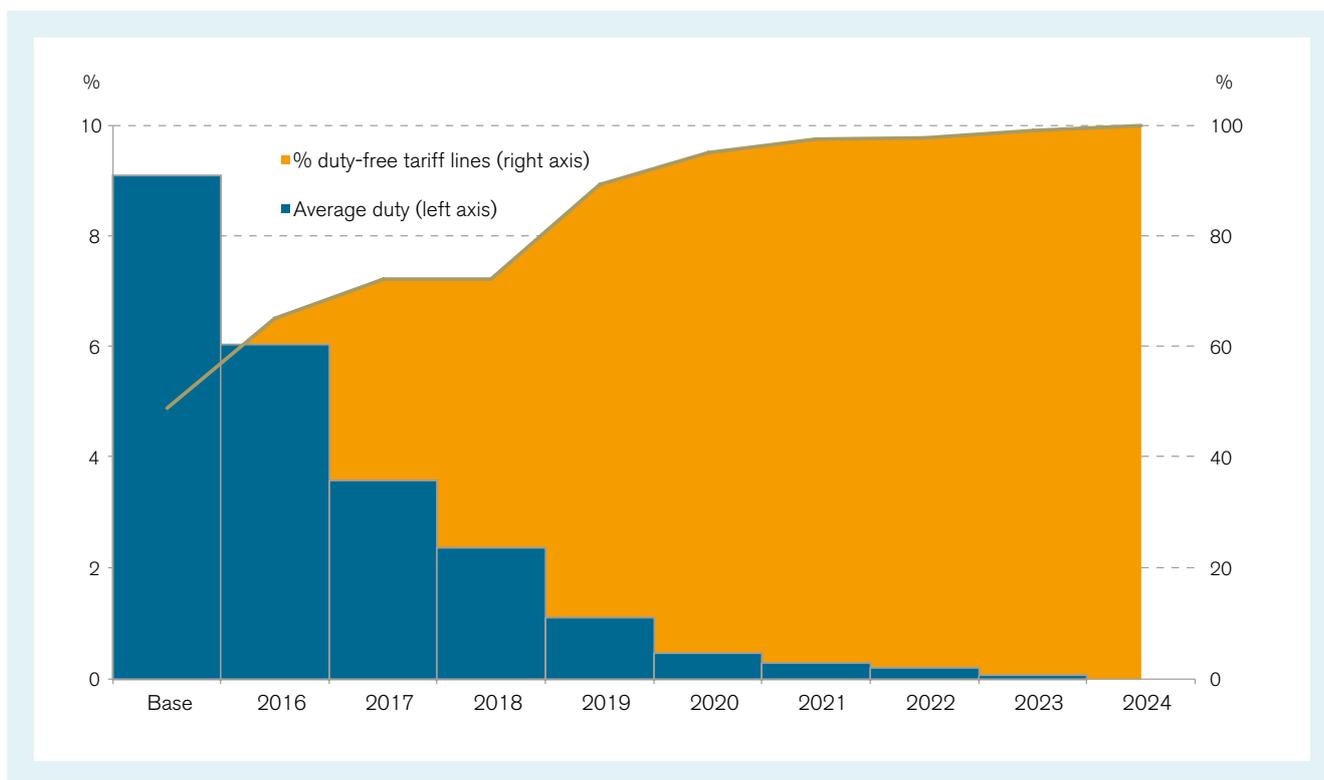
Consequently, the number of duty-free lines increased to 65 per cent in 2016. By 2019, at the end of the regular three-year period, only 11 per cent of tariff lines would still be dutiable with an average duty of just over 1 per cent.

By the end of the three-year period in 2019, only 5 per cent of ITA expansion imports will remain dutiable even if, by the same year, 11 per cent of tariff lines are not duty-free. Figure 4.5 shows a comparison of duty-free imports and duty-free tariff lines across the implementation period. As can be seen from the figure, the percentage of imports is consistently higher than the corresponding percentage of duty free tariff lines. This means that high-value traded products are already liberalized and the remaining dutiable tariff lines would only have minimal trade.

Tariff and trade data of non-ITA expansion participants

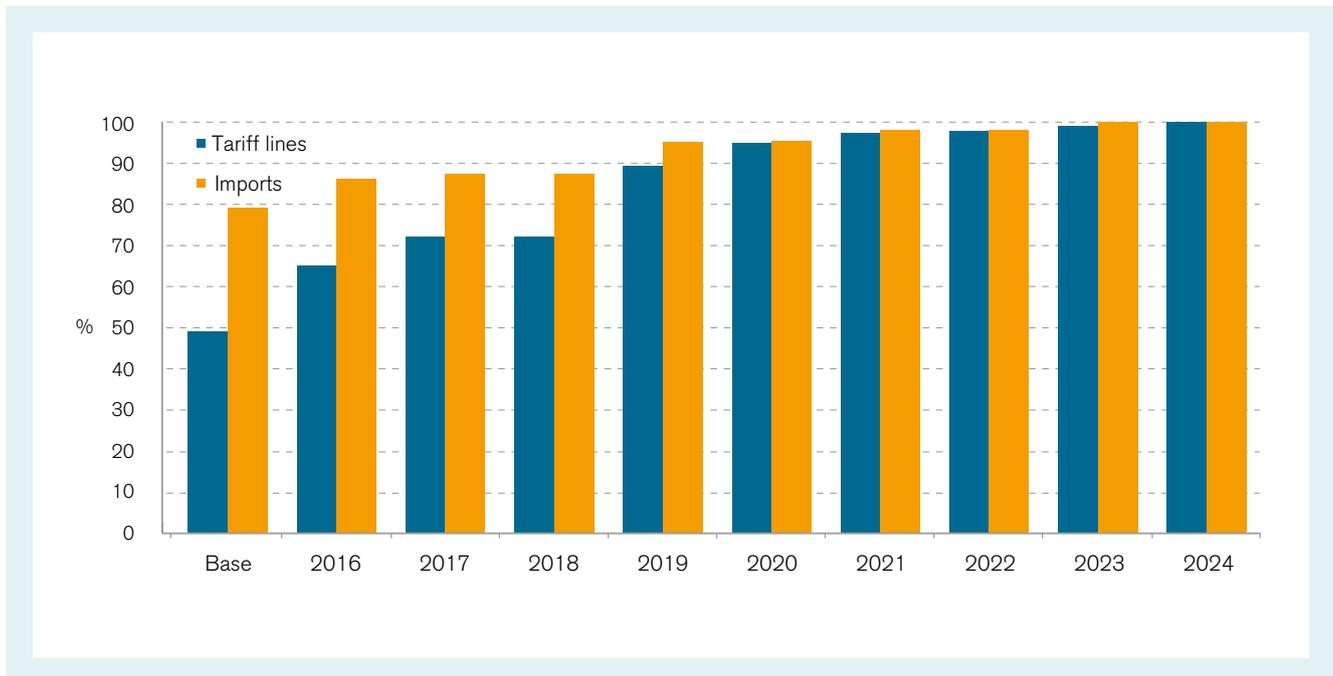
Table 4.3 shows the latest most-favoured nation (MFN) applied duties of non-ITA expansion participants. The data presented in the table only refer to products listed in Attachment A of the ITA expansion declaration, which are identified by a specific HS code, and do

Figure 4.4: Level of base duty and duty-free tariff lines across the implementation years of the ITA expansion



Source: WTO Secretariat calculations based on IDB data and draft ITA expansion schedules of participants, as submitted in 2015.

Figure 4.5: Duty-free tariff lines and imports of ITA expansion products across the implementation period (percentage)



Source: WTO Secretariat calculations based on IDB data and draft ITA expansion schedules of participants, as submitted in 2015.

not take into account duties applied on Attachment B products. In 2015-2016, the average tariff of non-ITA expansion participants was 6 per cent, with some products having duties of up to 87 per cent.

The average MFN applied tariffs of participants to the 1996 ITA which have not joined the expansion is 3.4 per cent. Nonetheless, in this group of economies, there are ITA expansion products which are subject to duties as high as 40 per cent. Among non-participants to the ITA expansion, LDCs have the highest average tariff as a group at 9.1 per cent, with tariff peaks of 40

per cent on some products. The breakdown of tariffs applied by members of the 1996 ITA, which have not joined the ITA expansion, is shown in Figure 4.6.

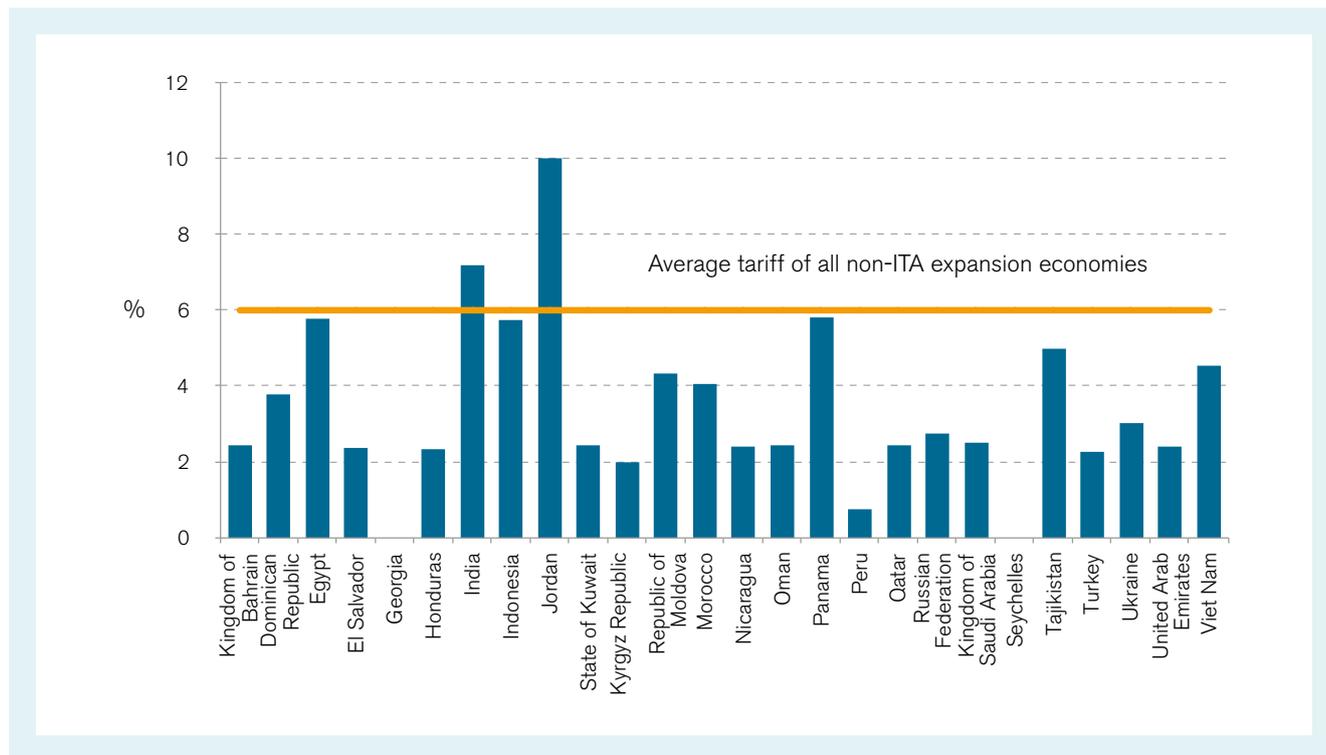
In terms of product categories, the highest applied tariffs by non-ITA expansion participants are in the “Electronic devices and games” category, where the average rate is almost 20 per cent (see Figure 4.7). All the other ITA expansion categories have average tariffs of less than 15 per cent. There are eight categories in which the average tariff is below 5 per cent which include popular consumer goods like printers, telephones, and medical equipment (see Box 4.6).

Table 4.3: Latest applied MFN tariffs of non-ITA expansion participants

| Economy group | Average (%) | Maximum (%) |
|--|-------------|-------------|
| Non-ITA expansion members | 6.0 | 87 |
| <i>Of which</i> | | |
| Participants to 1996 ITA only | 3.4 | 40 |
| Non-participants to the 1996 ITA, excluding LDCs | 7.2 | 87 |
| LDCs | 9.1 | 40 |

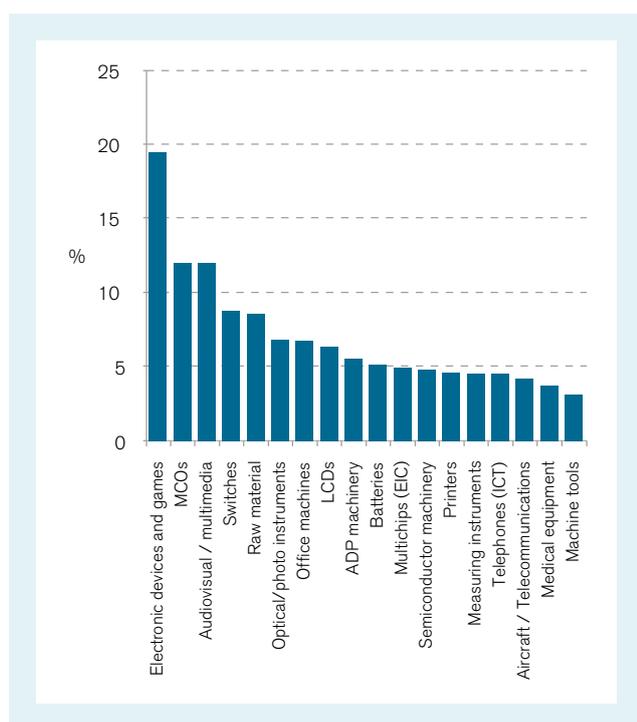
Source: Source: WTO IDB.

Figure 4.6: Average applied MFN tariffs of ITA members that are not participants to the ITA expansion



Source: WTO IDB.

Figure 4.7: Average MFN applied tariffs, by product category of non-ITA expansion participants



Source: WTO IDB.

Trade data under the ITA expansion

The value of ITA expansion exports was estimated at US\$ 1.28 trillion in 2015, accounting for approximately 10 per cent of world trade in goods. The value of ITA expansion exports is higher than that of agricultural products and other non-agricultural products – such as automotive products, textiles, and clothing – and only slightly less than exports of chemicals (see Figure 4.8).

In 2015, ITA expansion participants accounted for 92.3 per cent of world exports of ITA expansion products, and 7.7 per cent was covered by non-ITA expansion participants.

Among the ITA expansion participants, the top three exporters alone, namely China, the United States and the European Union, covered half of world trade of these products in 2015. Among them, China increased its market share the most between 2012 and 2015, with an increase of 1.6 percentage points, while Japan lost the most market share (-2.8 percentage points) (see Figure 4.9).

BOX 4.6 Reducing the cost of medical products under the ITA expansion

Liberalization of trade in ICT products may have far-reaching positive effects on national economies, beyond the ICT sector. A good illustration is the public health sector, which stands to benefit from the reduction and elimination of tariffs under the ITA expansion on a number of medical products and equipment, such as magnetic resonance imaging (MRI), ultrasound, and computed tomography units (see Table 4.4).

No economy is entirely self-reliant in terms of the products and equipment it needs for its public health system, with most economies relying in varying degrees on imports. As a result, the factors affecting imports will influence the availability, as well as the prices, of health-related products and technologies, and thus have immediate consequences for access to and affordability of healthcare. Import duties are one of the key factors influencing imports, but price and availability are also determined by non-tariff measures (e.g. licences, regulations and import formalities) and import-related costs, such as transportation. In addition, national distribution costs, such as wholesale and retail mark-ups and dispensing fees, may increase prices dramatically.

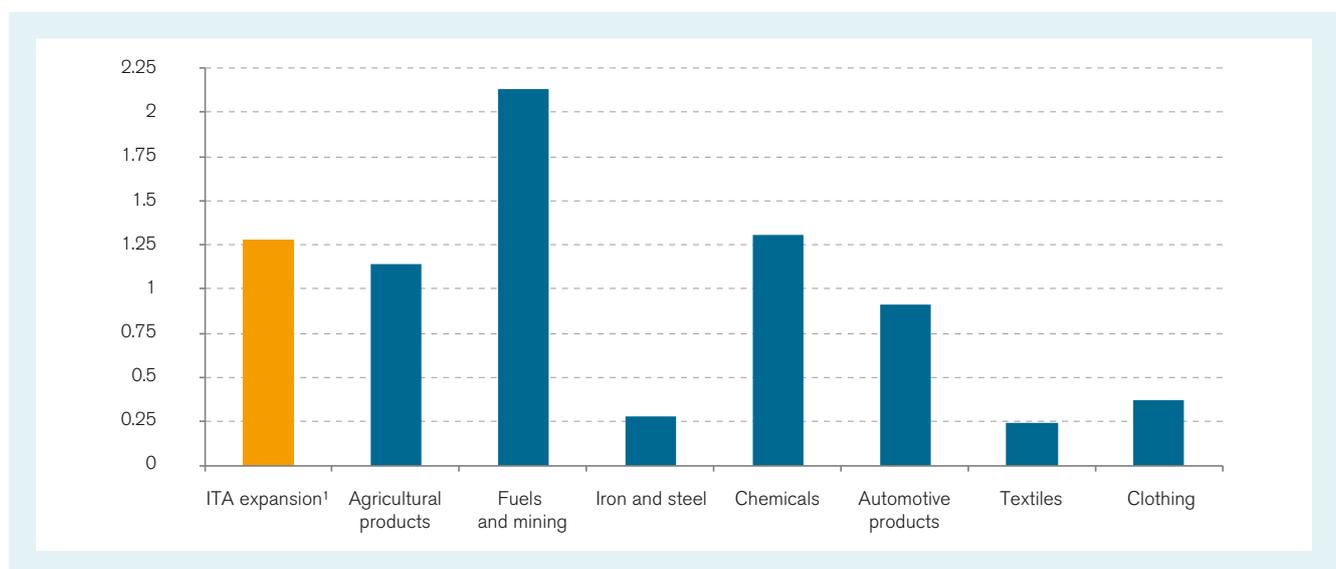
Because tariffs are a central component of import conditions, they may constitute a significant component of domestic prices. The elimination of tariffs on health equipment and technologies under the ITA expansion is expected to contribute to making healthcare more affordable for both public and private users.

Table 4.4: Examples of medical products covered by the ITA expansion

| Item | HS 2007 | Product Description |
|------|-----------|---|
| 146 | Ex 901811 | Electro-cardiographs |
| 147 | 901812 | Ultrasonic scanning apparatus |
| 148 | 901813 | Magnetic resonance imaging apparatus |
| 149 | 901819 | Other |
| 150 | 901820 | Ultra-violet or infra-red ray apparatus |
| 151 | 901850 | Other ophthalmic instruments and appliances |
| 152 | Ex 901890 | Electro-surgical or electro-medical instruments and appliances, and parts and accessories thereof |
| 153 | 902150 | Pacemakers for stimulating heart muscles, excluding parts and accessories |
| 154 | 902190 | Other |
| 155 | 902212 | Computed tomography apparatus |
| 156 | 902213 | Other, for dental uses |
| 157 | 902214 | Other, for medical, surgical or veterinary uses |
| 159 | 902221 | For medical, surgical, dental or veterinary uses |
| 161 | 902230 | X-ray tubes |
| 162 | Ex 902290 | Parts and accessories of apparatus based on the use of X-rays |
| 167 | 902519 | Other |
| 168 | 902590 | Parts and accessories |

Source: WTO Secretariat, based on official WTO document no. WT/L/956.

Figure 4.8: Exports of ITA expansion products in comparison to other product groups, 2015 (US\$ billion)



Source: WTO Secretariat based on UN Comtrade database.

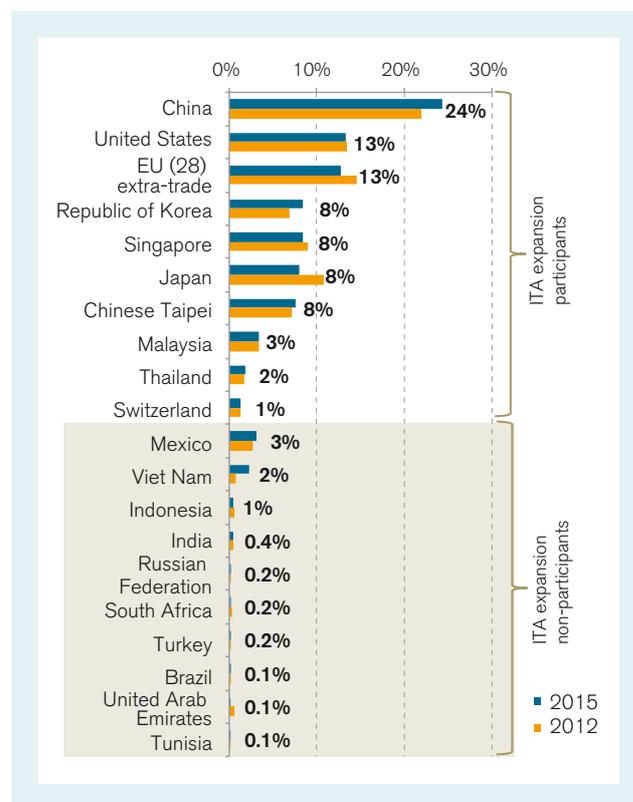
¹ Exports by participants to the ITA expansion negotiations. Excluding EU-intra trade and excluding re-exports of Hong Kong, China.

The non-ITA expansion participants with the highest shares in world exports of ITA expansion products were Mexico, with a share of 3.1 per cent in 2015 (up from 2.7 per cent in 2012), and Viet Nam, with a share of 2.2 per cent in 2015 (up from 0.7 per cent in 2012).

The 2015 breakdown of ITA expansion world exports by aggregated product groups is presented in Figure 4.10. Almost one-third of world exports consisted of multi-chips, followed by telephones (ICT) and audio-visual/multimedia. These three product groups covered almost 60 per cent of ITA expansion exports in 2015. Back in 2012 when ITA expansion negotiations started, the top three product groups in terms of export value were the same, although audio-visual/multimedia were in second position (with a share of 14 per cent in 2012) and telephones were in third place (with a share of 12 per cent).

Figure 4.11 shows the most exported ITA expansion products at HS six-digit level in 2015. While back in 2012, “electronic integrated circuits, processors and controllers [...]” (HS 85.4231) was the ITA expansion

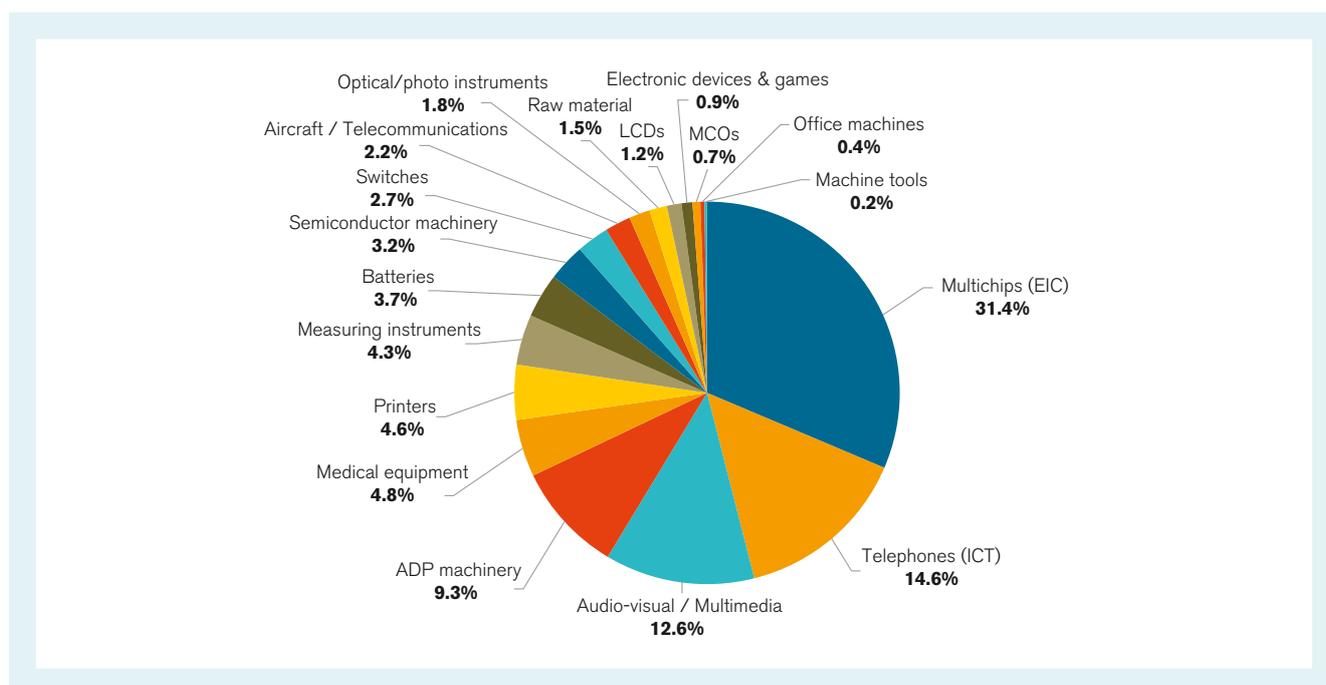
Figure 4.9: Top 10 exporters of ITA expansion products (participants/non-participants) (percentage share in world exports*)



*Excluding EU-intra trade and re-exports of Hong Kong, China.

Source: WTO Secretariat based on UN Comtrade database.

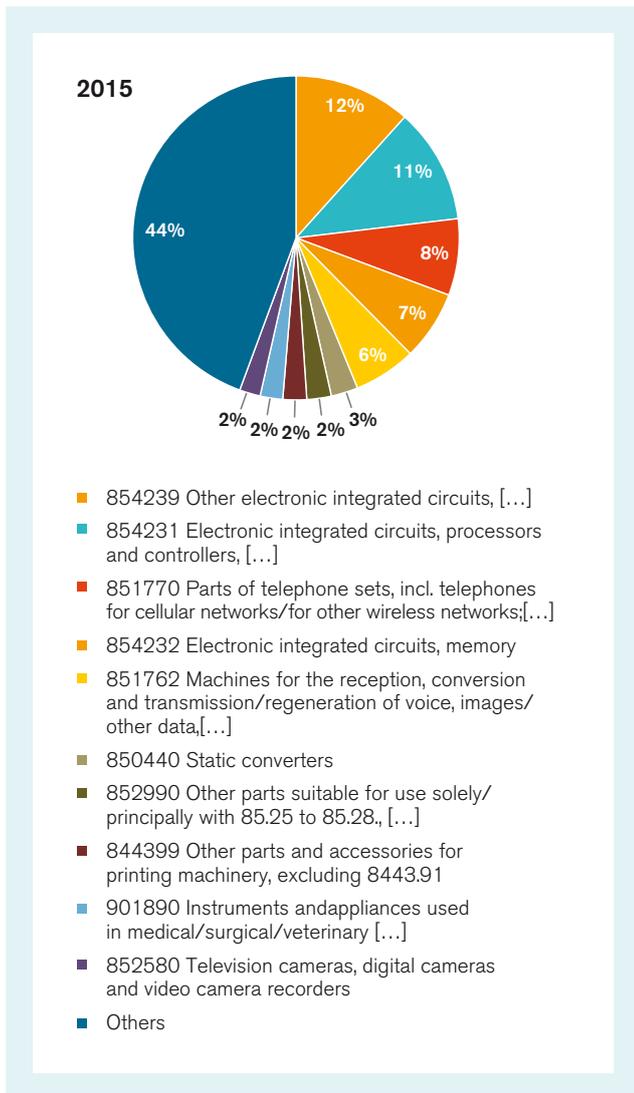
Figure 4.10: World exports of ITA expansion products by aggregated product groups, 2015 (percentage share in world*)



*Sum of reported data, excluding EU-intra trade and re-exports of Hong Kong, China.

Source: WTO Secretariat based on UN Comtrade database.

Figure 4.11: Top 10 exported ITA expansion products in 2015 (percentage share in world*)



product with the highest share in world exports, at 10 per cent, in 2015 it was overtaken by “Other electronic integrated circuits [...]” (HS 85.4239), which had a share of 12 per cent. In general, the composition of the top 10 ITA expansion products did not change in the last three years, except for their sequence in terms of ranking. The top 10 products covered 44 per cent of all exports of ITA expansion products in 2015.

*Sum of reported data, excluding EU-intra trade and re-exports of Hong Kong, China.

Source: WTO Secretariat based on UN Comtrade database.

Annex 4.1: Preparation of ITA expansion schedules

Similar to the 1996 ITA schedules, ITA expansion schedules consist of three inter-related sections:

- i) The “standard section”, which is based on the standard format for WTO schedules of concessions and contains information such as the national tariff nomenclature, the base rate, the final bound duty, the implementation period, and other duties and charges. Like the 1996 ITA schedules, the format includes two additional columns to identify the relevant concessions, including one for Attachment A items and the other for Attachment B items, which serve to identify and verify the concession on the specific tariff lines that are subject to liberalization commitments.
- ii) The “staging matrix” is used to reflect the annual tariff cuts that will be applied over the implementation period and the corresponding bound duty applicable every year until this is fully eliminated. It includes all the tariff lines flagged as ITA expansion items in the Standard Section, as Attachment A and/or Attachment B items; and
- iii) The “Attachment B” section, which is used to list the specific HS tariff codes that are used by participants to classify the ten items at the national tariff line level. Once identified, tariff lines relating to Attachment B items are reflected in the Standard Section.

The ITA expansion schedule also includes two headnotes.

The headnote in the standard section states the tariff liberalization commitments undertaken by the specific member in accordance with the July Declaration and clarifies that, regardless of the implementation period agreed for tariff reduction, the elimination of other duties and charges, as defined by Article II.1(b) of the General Agreement on Tariffs and Trade (GATT) 1994, must be effected upon entry into force of the Declaration. This headnote has been used as a basis for discussions among participants and does not replicate exactly the same text across all schedules. Some ITA expansion participants have included additional qualifications in the headnote of the Standard Section, for example in relation to the tariff classification of MCOs.

The headnote in Attachment B clarifies that with respect to any product described in the Attachment B of the July Declaration, the customs duties on such product, as well any other duties and charges of any

kind (within the meaning of Article II:1(b) of GATT 1994), shall be bound and eliminated, as set forth in that Declaration, wherever the product is classified.

While the preparation of a schedule may appear to be a mechanical exercise, in practice it is a difficult task that requires the determination of a large number of variables. During the negotiations, each ITA expansion participant had to determine, in close coordination with experts within its own government, how to identify national tariff lines for partially covered items, what base rate to use for tariff reduction, the staging period for each tariff line, and the relevant HS codes of Attachment B items. Some of these elements were of a purely technical nature and the WTO Secretariat was called upon to provide assistance with the preparation of schedules, as well as with their technical verification. However, other issues were the subject of extensive discussions among participants as they played a role in ensuring a balanced outcome of the negotiations.

Some of the issues faced by participants included, for instance, the choice of the base rate for tariff reduction and the identification of tariff codes for Attachment B items.

Base rate for tariff reduction

The main goal of the ITA expansion is to reduce and eliminate duties and other charges on covered products. If this does not take place immediately but over a certain number of years, it becomes necessary to define the starting point from which tariff cuts will take place. In this regard, participants faced three types of problems.

Firstly, tariff concessions under the ITA expansion were negotiated using the 2007 version of the HS nomenclature. However, actual trade in covered products was taking place on the basis of more up-to-date versions of the nomenclature. For the preparation of schedules, participants decided to use the latest applied tariff nomenclature in HS 2007 and left open the choice of the base rate.

Secondly, participants had to decide whether to start cutting tariffs from their current applied rates or from their bound duties, which were typically higher than the applied rates. This issue was very sensitive and in some cases required further negotiations on a case-by-case basis.

Thirdly, the July Declaration did not provide guidance regarding the base rate for unbound tariff lines, i.e. tariff

lines that were not included in a participant's WTO schedule of concessions and consequently did not have a bound rate of duty. In such cases, participants had to choose between their current applied MFN rates or any other rate of duty to be fixed at their discretion. Some participants decided to use the applied rate as a starting point for tariff reduction, as they considered that this choice would enforce their level of ambition and result in real market access for ITA expansion products. However, some participants noted that the Declaration did not provide guidance regarding the base rate and decided to fix their own base rate for unbound tariff lines.

Another challenge with respect to the choice of the base rate was that, at the time of staging the negotiations, the majority of ITA expansion participants did not have WTO schedules of concessions in the HS 2007 nomenclature, thus making it more difficult to estimate the level of concessions on tariff lines covered by the ITA expansion.

Classification of Attachment B items

As with the 1996 ITA, the ITA expansion uses two different lists of products commonly referred to as "Attachment A" and "Attachment B". During the ITA expansion negotiations, extensive discussions, including with the participation of capital-based customs experts, took place on the classification of the ten Attachment B items. The objective of the group was to try to find common ground on tariff classification for these items in order to minimize divergences among participants, as each of them could classify and implement Attachment B items differently.

During the negotiations, customs experts took the initiative of preparing a table compiling all the classification options listed by each participant in their respective schedules. This approach helped the group to narrow down the classification options and to advance discussions on which HS codes should be reconsidered or included in Attachment B and reflected in their ITA expansion schedules, keeping in mind the recommendations of the World Customs Organization.

However, it also became apparent that the group would not be able to agree on a common classification for each of the ten Attachment B items. Among them, one of the most complicated related to MCOs. In the context of HS 2007, MCOs were treated as parts or components of other products, so they were classified according to the product in which they would be incorporated. Each participant had different views on how to define and classify MCOs in the HS nomenclature. Indeed, the group identified approximately 25 HS headings (at the four-digit level) that could possibly contain MCOs, but in some cases participants presented lists with more than one hundred tariff lines where MCOs could possibly be classified. Other participants found a solution to this problem by making reference in their schedule to the classification that MCOs would receive in HS 2017, when MCOs would be classified under one specific tariff code.

There were also cases where HS codes listed in Attachment B of a participant's schedule had already been used to identify one or more ITA expansion products covered by Attachment A. For example, Annex Table 4.1 shows four tariff lines that correspond to item number "192" (MCOs) which is listed in Attachment B. Three of the four tariff lines are also flagged as Attachment A items (respectively ITA expansion item number 168, 171, and 182) meaning that it was possible for some products to be included in both Attachments A and B. In such cases there was an overlap between the two attachments.

Annex Table 4.2 provides an overview of the HS codes, at the chapter level, most commonly used by ITA expansion participants to classify Attachment B products. All participants have classified them in at least four chapters, i.e. HS chapters 85, 84, 39 and 49. Chapter 85 also includes the highest number of Attachment B products defined at the national tariff line level (644 national tariff lines among all participants). Some participants have classified Attachment B products in more than 10 different HS Chapters. In terms of trade covered, a quarter of the imports of goods covered by the ITA expansion are identified as Attachment B products.

■ Annex Table 4.1: Example of overlap between Attachments A and B items

| HS 2007 | Ex* | Description of the products | Base rate of duty | (B/U) | Final bound rate of duty | Implementation | | Other duties and charges (ODCs) | ITA expansion | |
|----------|------|--|-------------------|-------|--------------------------|----------------|------|---------------------------------|---------------|-----------|
| | | | | | | From | To | | Attach. A | Attach. B |
| 90259000 | | Parts and accessories | 8.0 | B | 0.0 | 2016 | 2021 | 0.0 | 168 | 192 |
| 90269000 | ex01 | Multi-component integrated circuits (MCOs) | 0.0 | B | 0.0 | 2016 | 2016 | 0.0 | | 192 |
| 90279000 | | Microtomes; parts and accessories | 0.0 | B | 0.0 | 2016 | 2016 | 0.0 | 171 | 192 |
| 90309000 | | Parts and accessories | 7.0 | B | 0.0 | 2016 | 2021 | 0.0 | 182 | 192 |

Source: WTO Secretariat, based on ITA expansion participants' schedules.
*In this case, "ex" indicates "partially covered".

Annex Table 4.2: Overview of the HS codes most commonly used by ITA expansion participants to classify Attachment B products

| Chapter (HS 2007) | Number of tariff lines | Number of participants |
|---|------------------------|------------------------|
| 85 – Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles. | 644 | 25 |
| 84 – Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof. | 443 | 25 |
| 39 – Plastics and articles thereof. | 50 | 25 |
| 49 – Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans. | 36 | 25 |
| 32 – Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks. | 62 | 24 |
| 95 – Toys, games and sports requisites; parts and accessories thereof. | 66 | 19 |
| 59 – Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use. | 15 | 15 |
| 90 – Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof. | 251 | 14 |
| 93 – Arms and ammunition; parts and accessories thereof. | 31 | 4 |
| 37 – Photographic or cinematographic goods. | 4 | 4 |
| 68 – Articles of stone, plaster, cement, asbestos, mica or similar materials. | 9 | 3 |
| 48 – Paper and paperboard; articles of paper pulp, of paper or of paperboard. | 2 | 2 |
| 63 – Other [textiles and textile articles] made up textile articles; sets; worn clothing and worn textile articles; rags. | 1 | 1 |
| 94 – Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings. | 1 | 1 |

Source: WTO Secretariat, based on ITA expansion schedules of participants.

Annex Figure 4.1: ITA expansion schedule template – standard section

Expansion of the Information Technology Agreement (ITA)

Schedule [roman number] - [MEMBER]
This Schedule is authentic only in the English language

PART I - MOST-FAVoured-NATION TARIFF SECTION II - Other Products

Notes:

[1. Concessions on products covered by the "Declaration on the Expansion of Trade in Information Technology Products" (WT/L/956) will be implemented as follows:

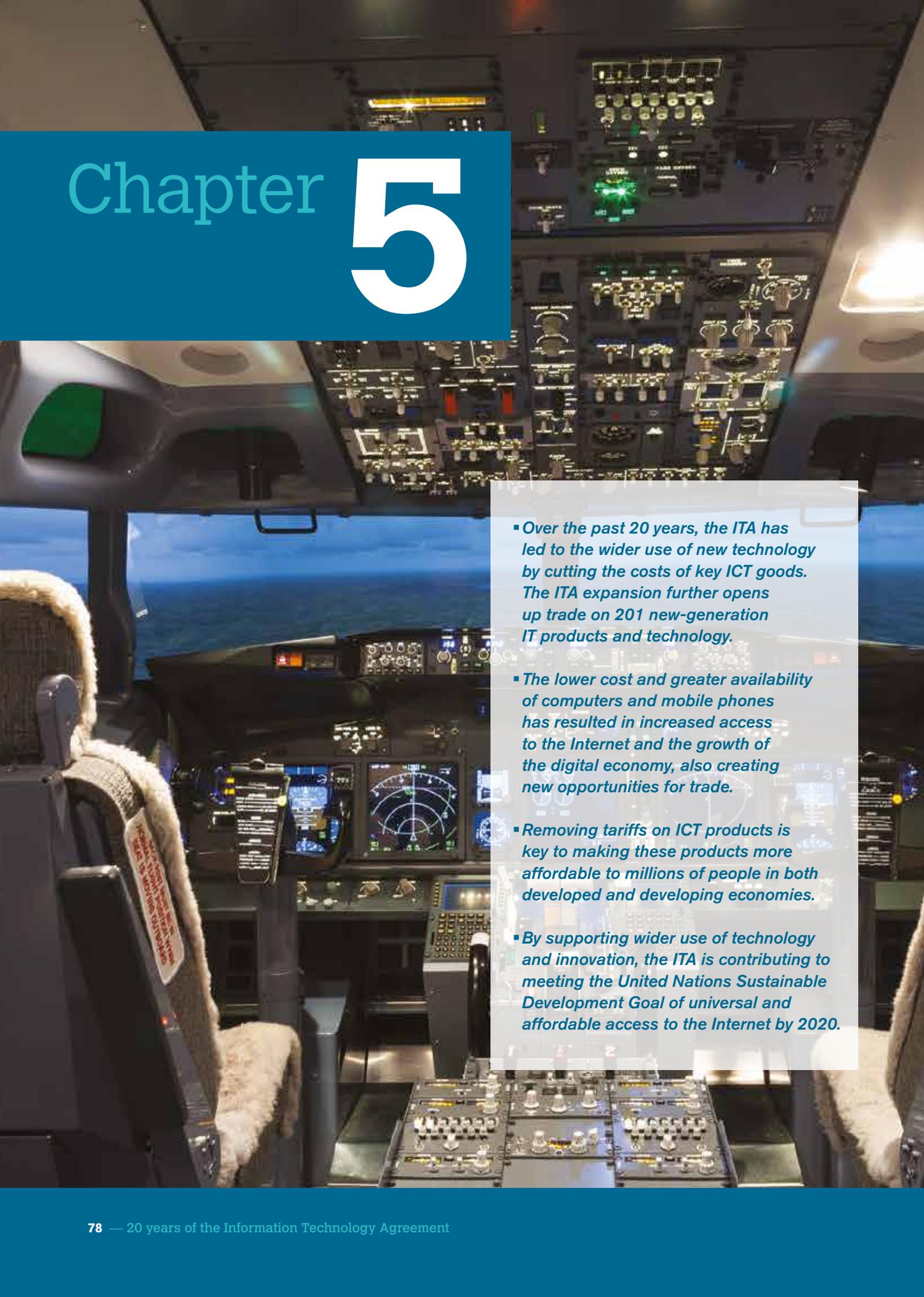
- Customs duties will be eliminated through equal annual reductions beginning on 1st July of 2016 and concluded on 1st July of the year indicated in column "Implementation / To" and the staging matrix section.
- Other duties and charges of any kind, within the meaning of Article II:1(b) of the GATT 1994, will be eliminated by 1 July 2016.]

| HS 2007 | ex | Description of the products | Base rate of duty (B/U) | Final bound rate of duty | Implementation | | INRs | Other duties and charges (ODCs) | ITA Expansion | |
|----------|----|---|----------------------------|--------------------------|----------------|------|------|---------------------------------|---------------|-----------|
| | | | | | From | To | | | Attach. A | Attach. B |
| 3506 | | Prepared glues and other prepared adhesives, not elsewhere specified or included; products suitable for use as glues or adhesives, put up for retail sale as glues or adhesives, not exceeding a net weight of 1 kg. | | | | | | | | |
| 35069 | | - Other: | | | | | | | | |
| 350691 | | -- Adhesives based on polymers of headings 39.01 to 39.13 or on rubber | | | | | | | | |
| 35069110 | | Optically clear free-film adhesives and optically clear curable liquid adhesives of a kind used solely or principally for the manufacture of flat panel displays or touch-sensitive screen panels | 20,0 | 0,0 | 2016 | 2019 | | 0,0 | 001 | |
| 35069190 | | Other | 10,0 | 10,0 | | | | 5,0 | | |
| 3701 | | Photographic plates and film in the flat, sensitised, unexposed, of any material other than paper, paperboard or textiles; instant print film in the flat, sensitised, unexposed, whether or not in packs. | | | | | | | | |
| 37013000 | | Other plates and film, with any side exceeding 255 mm | 10,0 | 0,0 | 2016 | 2019 | | 0,0 | 002 | |
| 37019 | | - Other: | | | | | | | | |
| 37019900 | | Other | 5,0 | 0,0 | 2016 | 2019 | | 0,0 | 003 | |
| 3705 | | Photographic plates and film, exposed and developed, other than cinematographic film. | | | | | | | | |
| 37059000 | | Other | 0,0 | 0,0 | 2016 | 2019 | | 0,0 | 004 | |
| 3707 | | Chemical preparations for photographic uses (other than varnishes, glues, adhesives and similar preparations); unmixed products for photographic uses, put up in measured portions or put up for retail sale in a form ready for use. | | | | | | | | |
| 37079000 | | Other | 10,0 | 0,0 | 2016 | 2019 | | 0,0 | 005 | |

Endnotes

- 1 Ezell (2012b) reports that “global value-added by ICT industries has more than doubled from \$1.2 trillion in 1995 to \$2.8 trillion in 2010, when the ICT industry accounted for 6 percent of global GDP”.
- 2 According to OECD (2015), “the ICT sector accounted for 3 percent of total employment in OECD economies in 2015. Overall, total contribution of the ICT sector to total employment growth stood at 13 per cent in 2013, similar to its share prior to the dot-com crisis. While employment within the ICT sector has remained stable, employment of ICT specialists across all sectors of the economy has increased, reaching at least 3 per cent of total employment in most OECD countries”.
- 3 Paragraph 3 of the Annex to the Ministerial Declaration on Trade in Information Technology Products, official WTO document no. WT/MIN(96)/16 (accessible at https://www.wto.org/english/docs_e/legal_e/legal_e.htm).
- 4 For more information on the review of product coverage under the 1996 ITA, see WTO (2012), Chapter II Section D.
- 5 See official WTO document no. G/IT/W/36, “Concept Paper for the Expansion of the ITA. Communication from Canada, Japan, Korea, the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu, Singapore and the United States”, 2 May 2012, accessible at <https://docs.wto.org/>
- 6 A proposal for the expansion of the product coverage under the ITA was already submitted to the ITA Committee in September 2008 by the European Union (see official WTO document no. G/IT/W/28). That proposal covered a number of other issues, such as the review of the ITA, negotiations on non-tariff barriers, enlargement of the ITA membership, etc. A number of delegations sought clarifications on the scope and time-frame of the review proposed by the European Union. However, discussions on this issue did not advance in the ITA committee, mainly due to the dispute “EC-IT products” on the classification of certain ITA products. For more information see WTO (2012), chapter II. On 15 May 2012, the European Union agreed to separate discussions on non-tariff barriers (NTBs) and the ITA expansion negotiations and endorsed the concept paper.
- 7 Source: Official WTO document no. G/IT/W/36.
- 8 For additional information, see WTO (2012), Chapter I, Section C.
- 9 Source: http://www.digitaleurope.org/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&entryID=412&language=en-US&PortalId=0&TabId=353
- 10 The WTO members that participated in the ITA expansion negotiations were: Albania; Australia; Canada; China; Colombia; Costa Rica; the European Union (and its 28 member states); Guatemala; Hong Kong, China; Iceland; Israel; Japan; the Republic of Korea; Malaysia; Mauritius; Montenegro; New Zealand; Norway; the Philippines; Singapore; Switzerland-Liechtenstein; Chinese Taipei; Thailand; Turkey; and the United States. Other WTO members joined the negotiations at some points but did not conclude them.
- 11 Participants that hosted the ITA expansion negotiations were: Canada, the European Union, the Republic of Korea, Japan and the United States.
- 12 Like the 1996 ITA, products proposed for liberalization under the ITA expansion are defined at subheading level (HS 6-digit code). Among these, some products are “fully covered”, meaning that all the national tariff lines falling within the sub-heading are subject to liberalization, whereas other products are “partially covered”, meaning that not the entire sub-heading is subject to liberalization. In the case of “partially covered” items, only the national tariff line corresponding to the product description identified in the negotiations will be liberalized while the rest of the subheading remains unchanged. Partially covered items are also called “ex-outs” and are identified with the symbol “ex” in the Annex to the ITA Expansion declaration.
- 13 See official WTO document no. G/IT/M/56; and USITC (2012).
- 14 Official WTO document G/IT/M/57, page 2.
- 15 For more information on the suspension of talks see <http://www.ictsd.org/bridges-news/bridges/news/ita-expansion-talks-suspended>
- 16 For more background information on the ITA expansion negotiations see also European Commission (2016).
- 17 Throughout the entire process of the ITA expansion negotiations, the group held a great number of ambassador-level meetings with a view to resolving some important and political issues.
- 18 See official WTO document no. WT/L/956, “Declaration on the Expansion of Trade in Information Technology Products: Communication from the European Union”, accessible at <https://docs.wto.org/>
- 19 Ibid, paragraph 5.
- 20 Official WTO document number WT/L/956, available at <https://docs.wto.org/>
- 21 According to paragraph 2 of the July Declaration, “The parties shall apply three year staging in four equal annual reductions of customs duties, beginning in 2016 and concluding in 2019, as standard staging, unless otherwise agreed by the parties, recognizing that extended staging of reductions may be necessary in limited circumstances”.
- 22 The rationale behind the “building blocks” proposal was that such products were already intended for immediate liberalization under the 1996 ITA, but that their coverage was affected by technological innovation or changes in the tariff nomenclature.
- 23 These mainly include printers (HS heading 8443), semiconductor manufacturing equipment (HS 8486), telephones (HS 8517), media (i.e. “discs, tapes, solid-state non-volatile storage devices, ‘smart cards’ 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”) (HS 8523) and semiconductors (HS 8542).
- 24 The main argument against staging beyond three years was that the agreement was expected to be commercially meaningful, and that, due to the short life cycle of ICT products, these could not wait for five or seven years or longer periods in order to get access to a market, as by that time they would have become obsolete.
- 25 By 4 December 2015, the following ITA expansion schedules had been approved: Albania; Colombia; Costa Rica; Guatemala; Hong Kong, China; Iceland; Israel; Japan; Malaysia; Mauritius; Montenegro; New Zealand; Norway; Singapore; and Switzerland. The draft schedules of Australia, Canada, China, the European Union, the Republic of Korea, the Philippines, Chinese Taipei, Thailand, Turkey and the United States remained pending.
- 26 With respect to Turkey’s draft ITA expansion schedule, substantive technical work remained to be completed and a revised schedule was not submitted in time for approval before the Nairobi deadline.
- 27 Contained in official WTO document no. WT/MIN(15)/25, “Ministerial Declaration on the Expansion of Trade in Information Technology Products”, 16 December 2015 (accessible at <https://docs.wto.org/>).
- 28 Ibid, paragraph 2.
- 29 Ibid, paragraph 3.
- 30 These are the schedules of: Australia; Canada; China; the European Union; Hong Kong, China; Iceland; Israel; Japan; the Republic of Korea; Malaysia; Mauritius; Montenegro; New Zealand; Norway; Singapore; Chinese Taipei; Thailand; and the United States.
- 31 Not all ITA expansion participants implemented their first tariff cut on 1 July 2016. Some participants, for instance Australia and Switzerland, had indicated during the negotiations that their first tariff cut would take place on 1 January 2017. Other participants also indicated the need to complete their domestic procedures for acceptance of the ITA Declaration in order to be able to implement it.

Chapter 5



- *Over the past 20 years, the ITA has led to the wider use of new technology by cutting the costs of key ICT goods. The ITA expansion further opens up trade on 201 new-generation IT products and technology.*
- *The lower cost and greater availability of computers and mobile phones has resulted in increased access to the Internet and the growth of the digital economy, also creating new opportunities for trade.*
- *Removing tariffs on ICT products is key to making these products more affordable to millions of people in both developed and developing economies.*
- *By supporting wider use of technology and innovation, the ITA is contributing to meeting the United Nations Sustainable Development Goal of universal and affordable access to the Internet by 2020.*

The ITA and the international digital economy

A. Introduction

The main objective of the Information Technology Agreement (ITA) has been to open up world trade in information and communications technology (ICT) products, to encourage the continued development of the ICT industry and to bring about greater access to high-tech products across the world. The ITA expansion continues that work by expanding the scope of access to over 200 new-generation ICT products, including products that were not covered or did not exist at the time of the first ITA.

Over the past 20 years, the 82 WTO members participating in the ITA have liberalized their trade in ICT products covered by the agreement through the reduction and elimination of customs duties and other charges. Currently about 88 per cent of world imports of ITA products are duty-free as a result of bound tariff commitments pursuant to the ITA. By reducing the cost of ICT, the ITA and the ITA expansion play a vital role in promoting affordable access to ICT and thus the adoption and use of technology. However, it is still difficult for many developing economies and least-developed countries (LDCs) to gain access to technology and innovation, also because in these economies the cost of ICT goods and services remains high, making technology unaffordable.

This chapter discusses how the ITA and the ITA expansion can contribute to significantly increasing access to and affordability of ICT goods and technology, by opening up untapped opportunities for developing economies and LDCs, who stand to benefit from ICT adoption and access to the Internet. The case studies presented in this chapter show how reducing the price of mobile phones, computers and other ICT inputs used for the improvement

Currently about 88 per cent of world imports of ITA products are duty-free.

of network infrastructure can widen broadband adoption and thereby increase Internet usage, creating new opportunities for trade and development. This ties in with the fact that universal access to the Internet has been recognized as a development priority and has been set as a target under Goal 9.C of the United Nations Agenda for Sustainable Development (i.e. “Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least-developed economies by 2020”). Against this background, the role of the ITA and the ITA expansion in making ICT more affordable and facilitating universal access should be underscored.

B. The role of the ITA in the digital economy

Over the past 20 years, the ITA has played an important role in increasing global trade and investment in ICT, encouraging ICT adoption by cutting costs of ICT products. As shown in Chapter 2, in 2016, import prices of ICT goods such as computers and semiconductors were around 66 per cent lower than the corresponding level in 1996, while average import prices for capital goods were only about 25 per cent lower.¹

The International Telecommunication Union (ITU) also reported that mobile-cellular prices continued to fall in 2015, and more steeply than in previous years: “For the first time, the average cost of the mobile-cellular basket (which includes 100 SMS and 30 mobile calls per month) in developing economies accounted for less than 5 per cent of GNI per capita. Least-developed countries (LDCs) saw a 20 per cent drop in mobile-cellular prices, the strongest decrease in five years”.²

Removing tariffs on ICT products has made these products, and the potential of technology innovation associated with them, affordable to a growing number of people around the world. Similarly, the lower cost and widespread availability of computers and mobile phones has had a particular impact on access to the Internet and the growth of the digital economy and has created new opportunities for trade.³

In 2016, import prices of ICT goods such as computers and semiconductors were around 66 per cent lower than the corresponding level in 1996.

For example, the explosion of e-commerce would not have happened without innovations enabled by digital technologies. Internet-based platforms such as Amazon, Airbnb, Uber, Alibaba and eBay, led to new forms of trade, such as consumer-driven trade, which would have been inconceivable in the past. In 2016, Alibaba.com estimated that its business-to-consumers (B2C) e-commerce market would grow by a staggering 27 percent until 2020. However, business-to-business (B2B) e-commerce growth is far more significant than B2C e-commerce. According to UNCTAD's estimates, in 2015 e-commerce was valued at about US\$ 25 trillion, of which more than US\$ 22 trillion was represented by B2B e-commerce.⁴

A paper commissioned by the E15Initiative (a joint initiative by the International Centre for Trade and Sustainable Development (ICTSD) and the World Economic Forum) Expert Group on the Digital Economy suggests that the potential economic growth to be realized from liberalizing barriers to Internet access and digital trade is greater for the developing world, where a combination of growing young populations, rising incomes and urbanization should reduce the marginal cost of extending access to a wider population in the near future.⁵

As reported by Ezell and Wu (2017),

“throughout the developing world [...] greater ICT usage supports higher sales, productivity, and even employment at the enterprise-level. In general, developing-country small- and medium-sized enterprises (SMEs) experience a 10 percent productivity boost from Internet usage. In Vietnam, firms using e-commerce enjoy total factor productivity growth 3.6 percentage points higher on average than firms that do not use it”.

Citing a World Bank survey, Ezell and Wu also note that:

“ICT-enabled firms in developing countries were twice as profitable, 65 percent more productive, and boosting employment 25 percent faster than firms that did not adopt ICTs. Likewise, a study of six West African countries found that approximately 40 percent of their increase in total factor productivity growth was attributable to ICT-related growth”.

In developing economies, mobile-phone enabled technology has already provided innovative solutions for business. Ezell (2012a) notes that “the proliferation of mobile communications/computing devices has bolstered the productivity, efficiency, and innovative capability of citizens and businesses, inspiring a wave of mobile-phone enabled innovations”. To cite just one example, the award-winning Kenyan website/app M-Farm enables Kenyan farmers to use the SMS feature of their mobile phones to receive information relating to the real-time retail prices of their products and to find buyers for their produce.⁶ In recognizing that mobile technologies have become platforms for innovation, the Information Technology and Innovation Foundation (ITIF) notes that the ITA has played an important role in furthering their diffusion throughout the developing world:

“whether it comes to computers, servers, mobile devices, or componentry for the data centers and telecommunications networks that underlie enterprises’ ability to engage in e-commerce, create websites, or operate their businesses digitally, the ITA has played a key role in lowering prices for the ICT hardware, platforms, systems, and devices that underpin the digital revolution. In other words, the ITA supports the ICT hardware on which the global digital economy now runs.”⁷

C. Barriers to the adoption and use of technology

Despite the liberalization of trade in key ICT products brought by the ITA and the progress in the diffusion of technology over the past 20 years, a number of barriers to its adoption and use continue to exist. Studies have shown that raising the cost of access, for example through the application of tariffs to essential ICT products, necessarily limits a firm's ability to participate effectively in global trade.⁸ In a world in which trade increasingly takes place within global value chains, market access is defined by a firm's capacity to communicate with other links in the production process, to add value through its contributions, and, increasingly, to innovate in collaboration with other participants in the value chain. Access to the Internet is fundamental to that process.

In such an interconnected world, the existence of barriers to trade, including traditional barriers such as tariffs, remain a significant obstacle to the access and adoption of ICT, hindering innovation and progress. As we have seen in Chapter 2, tariffs applied by non-ITA participants remain generally high, and can reach 45 per cent in some markets and on some products.⁹ These figures are even higher for products covered by the ITA expansion, where import duties can be as high as 87 per cent in economies that are not parties to the agreement. Moreover, participation in the two agreements, which represent the primary vehicle for multilateral liberalization for the ICT sector, by developing economies and LDCs remains limited.

The link between cost/affordability of ICT goods and services with the use of Internet is illustrated in submissions to the OECD/WTO 2017 Aid for Trade monitoring and evaluation exercise, where it is shown that affordable access to the Internet weighs heavily on firms, consumers, custom officials and other border authorities and affects their ability to take advantage of the opportunities presented by e-commerce. In this context, the ITA and the ITA expansion have a role to play, as illustrated below.

D. Improving ICT affordability

Universal access and affordability of ICT and Internet services generally refers to availability (in terms of locality), accessibility (in relation to demography) and affordability (referring to cost, which is affected by technology, efficiency and rate of expansion).¹⁰ Thus the cost of ICT is one of the main inhibitors of the adoption and use of technology.

With respect to affordability, the new edition of *Aid for Trade at a Glance 2017: Promoting trade, inclusiveness and connectivity for sustainable development*, to be published at the Global Review 2017, indicates that the cost of service is not the only price component to be considered in relation to mobile-broadband services, and that other factors such as the cost of a smartphone may be a decisive factor for future uptake.¹¹ Similarly, ITU (2016) notes that among the main barriers to mobile-phone ownership, the “cost of the handset” is still mentioned as the main barrier to owning a mobile phone.¹² According to the ITU, an average of 20 per cent of the population in developing economies still does not use mobile phones, and in some large developing economies the proportion of mobile phone ownership is even lower, affecting more than 40 per cent of the population.¹³

These data suggest that there is a need for developing economies and LDCs to cut the costs of ICT if they

want to improve access to technology and unlock opportunities. In this context, participation in the ITA and the ITA expansion, which aims to reduce the cost of ICT products, such as computers, servers and mobile phones, could be a driver for reforms, as has been the case for some economies that have managed to achieve more affordable Internet access.

According to the 2017 Affordability Drivers Index (ADI)¹⁴ developed by the Alliance for Affordable Internet, which looks at the policy and regulatory frameworks in place across 51 developing and emerging economies to determine what solutions are effectively expanding access to affordable broadband, four out of the top five economies with improved infrastructure and access to more affordable Internet – namely Colombia, Peru, Malaysia and Costa Rica – are all ITA participants. Colombia, Costa Rica and Malaysia are also participants to the ITA expansion.

In the case of Colombia, which has enjoyed the top ranking in the ADI for the past three consecutive years, Alliance for Affordable Internet (2017) notes that much of its success so far has been driven by government leadership in implementing effective policies and building partnerships within the ICT sector. These policies include better incentives for broadband adoption at all levels, such as elimination of customs tariffs and value-added tax on the purchase of personal computers, subsidies for computers and special subsidized tariffs for Internet access in low-income households.¹⁵

Alliance for Affordable Internet (2017) further highlights as one of the recommended actions to be undertaken by governments in developing and least-developed economies the reduction of the cost of mobile phones and ICT devices through the reform of tax and patent regimes in order for ICT device costs to come down. The importance of affordable Internet for developing economies is further highlighted in the case stories presented below (see Boxes 5.1 and 5.2).

An average of 20 per cent of the population in developing economies still does not use mobile phones.

BOX 5.1 Case stories on internet affordability: Ghana ¹⁶

From a 2012 survey conducted in Ghana, it emerged that affordable broadband remains a dream for the majority of Ghana's 25 million inhabitants. Consumers said that their primary reason for not accessing the Internet was cost.

Back in 2005, Ghana adopted a National Telecoms Policy (2005 NTP) which sought to ensure universal access to telephone, Internet and multimedia services by 2010, and for national penetration of universal telecommunications services to reach 25 per cent of the population, including at least 10 per cent in rural areas, by the year 2010.

Implementation of the 2005 NTP has borne some fruit. For instance, between 2005 and the end of 2012, mobile penetration grew from 13.28 per cent to more than 100 per cent (however, it is estimated that there are about two SIM cards per subscriber in Ghana thus true universal telephony service is yet to be achieved). Ghana's access to international bandwidth has also increased thanks to liberalization and increased competition. Between 2010 and 2013, four fibre optic submarine cables were landed in Ghana, boosting the amount of international bandwidth from 320 Gigabytes to over 12 Terabytes.

However, the increase in international bandwidth and mobile phone penetration have not translated into widespread Internet access. 2012 ITU figures suggested that only 17.1 per cent of Ghanaians use the Internet. As in much of Sub-Saharan Africa, disparities between urban and rural areas in ICT ownership and usage also remain a challenge in Ghana. According to the 2010 Ghana census, only 47.8 per cent of Ghanaians own a mobile phone, and while 63.4 per cent of urban dwellers own phones, only 29.6 per cent of rural dwellers do. In respect to Internet usage, the difference between urban and rural users is even more pronounced. While 12.7 per cent of urban dwellers used the Internet in 2010, only 2.1 per cent of rural dwellers did.

The challenge of connecting all Ghanaians to broadband is multifaceted. Low ownership of devices such as tablets, laptops and personal computers is often cited

as a barrier. Only 7.9 per cent of households own a laptop or computer. A lack of access to networks that facilitate a good, higher-speed Internet experience, such as 3G, LTE or fibre optic networks, was also a challenge. Lack of consumer demand, owing to limited local content and a relatively small number of local users with whom to interact, was also cited as a barrier.

However, the primary stumbling block is cost. Almost 60 per cent of Ghanaians said that the high cost of access prevented them from using the Internet. Broadband services in Ghana are relatively expensive and remain a luxury item for many Ghanaians. According to the ITU, a prepaid 500MB mobile handset mobile broadband package in Ghana costs 9 per cent of gross national income (GNI) per capita, almost double the UN's 5 per cent target, ¹⁷ causing Ghana to be ranked 96th out of 126 economies. In the 2017 ADI, Ghana ranked 26th due to the cost of broadband services, as these remain too expensive for most Ghanaians.

In response to these challenges, the Ministry of Communications of Ghana is in the process of finalizing a new broadband policy in which improving affordability is a key objective. The policy wants to ensure affordable access to broadband infrastructure for all Ghanaians and last mile connectivity to every home by 2020. Some specific government actions include prioritizing open access to the network, the creation of dedicated funds directly targeted at increasing broadband access and affordability, and the review of taxation on ICT, among other measures.

On taxation, Ghana's burden of taxation on the total cost of mobile phone ownership is more than 22 per cent, which is in stark contrast to Nigeria where only 5.4 per cent of the total cost of mobile ownership consists of taxes. In the draft broadband policy, the review of ICT taxation is a key objective of the government so as to achieve a more efficient tax regime and, as witnessed in other economies, encourage greater use of ICT, including broadband.

BOX 5.2 Case stories on internet affordability: Myanmar ¹⁸

Once the least connected country in the world, Myanmar now has one of the world's fastest growing telecom markets. The change can largely be attributed to the liberalization of the ICT sector, consequent competition between service providers, and falls in the cost of connecting to both voice and Internet services.

In 2000, the cost of a SIM card in Myanmar (US\$ 5,000) presented a significant barrier to usage and few people could afford to subscribe to mobile services. Despite the falling cost of a SIM card during the last decade, the price remained an insurmountable barrier for many until 2014, when a potential mobile subscriber

in Myanmar would have had to pay US\$ 150 for a SIM card. The liberalization of the ICT sector contributed to a dramatic drop in the price of SIM cards, which today cost just US\$ 1.50. With three-quarters of Myanmar's 51.4 million people not connected to any basic telecommunication services, the commercial opportunities for operators, as well as the socio-economic development opportunities for the population, are clear.

ICT use in Myanmar is also limited. In 2013, the fixed-line telephone penetration rate stood at 1 per cent, mobile penetration at 12.83 per cent, and Internet users at 1.2 per cent. While all of Myanmar's ICT connection

benchmarks are relatively low, it is perhaps the low number of Internet users that is most significant for those focused on leveraging ICT for development.

Evidence from other developing markets in Asia and farther afield indicates that mobile telephony can experience exponential growth given the right conditions. However, unlike the development of mobile voice telephony, in order for a similar explosion in Internet and broadband usage to occur, governments and other stakeholders must do much to stimulate both the supply of and demand for Internet and broadband services.

Challenges including limited user awareness, the high cost of smartphones and other devices, the limited availability of services, and the cost of services themselves, are all cited as barriers to increased access and all require action.

The Ministry of Communication and Information Technology of Myanmar has given mobile operators ambitious targets for the rollout of infrastructure and uptake of services. The mobile network population coverage is expected to grow from the current level of 12 per cent to 95 per cent by 2020 and the uptake of broadband Internet to at least 25 per cent by 2018.

E. The importance of connectivity for development

The liberalization of trade in ICT products under the ITA has contributed to the increased use of ICT products and technology, which has had a direct impact on innovation, productivity and growth. According to the ITIF, while the production of ICT goods and services is important for economies, the vast majority of economic benefits from technology – as much as 80 per cent – come from the widespread usage of such technology, while only approximately 20 per cent of the benefits of technology comes from its production.¹⁹ Therefore, expanding access to and usage of Internet is key to unlocking the potential economic and social benefits deriving from it.

According to a study conducted by Deloitte for Facebook,²⁰ the positive effects of connectivity are potentially greater in developing economies than in developed economies due to the reduced quality of physical and administrative infrastructure that support the functioning of the markets. SMEs in developing economies are among the biggest winners from receiving access to the Internet, and extending internet connectivity is critical to accelerating economic and social growth in developing economies while enabling the transition from a resource-based to a knowledge-based economy.

However, connectivity remains limited for many developing and least-developed economies, where access to telecommunications and to the Internet occurs mainly through mobile technology. In contrast, in developed economies, Internet access is widespread and technological advancements have reduced the cost of access and increased the quality of connection. Consumers can enjoy a choice of fixed, Wi-Fi, and mobile technology and most of them are able to access high speed broadband. Ensuring the same level of

connectivity in developed and developing economies could mean that long run productivity could be enhanced by as much as 25 per cent in developing economies.²¹

Indeed, mobile technology has seen unprecedented growth in developing economies, as, according to ITU (2016), the number of mobile cellular subscriptions has continued to grow at double digit rates, reaching a penetration rate of close to 41 per cent, covering about 3.6 billion people by the end of 2016.²² The number of households with access to the Internet reached 1 billion across the world, of which 230 million are in China, 60 million in India, and 20 million in all the 48 LDCs. According to the ITU, in 2016, the proportion of the global population covered by a mobile-broadband network (3G or above, i.e. rendering larger data formats more accessible than with previous 2G networks)

Mobile technology has seen unprecedented growth in developing economies as the number of mobile cellular subscriptions has continued to grow at double digit rates, covering about 3.6 billion people by the end of 2016.

reached 84 per cent, but only 67 per cent of people living in rural areas were covered. Just over half of the global population (53 per cent) is covered by LTE (“Long Term Evolution”, i.e. technology used to pursue 4G standards) or higher networks, enhancing the quality of Internet use, with only a small proportion living in rural areas.

However, while infrastructure development is crucial, high prices, poor quality of service and other barriers are serious obstacles to encouraging people to enter the digital world.²³ Besides the cost of ICT devices mentioned above, another reason for the limited uptake of Internet in the developing world is the price of broadband services, which are still unaffordable for poor segments of the global population. While the prices of fixed and mobile services continue to fall globally, the cost of mobile-broadband services still represent more than 5.5 per cent of GNI per capita worldwide. The average price of a basic fixed-broadband plan is more than twice as high as the average price of a comparable mobile-broadband plan. In LDCs, fixed-broadband services are on average more than three times as expensive as mobile-broadband services. According to World Bank (2016), “in Latin America, fewer than 1 in 10 poor households is connected to the internet. In the Central African Republic, one month of internet access costs more than 1.5 times the annual per capita income”.²⁴ Income inequalities within economies are one of the reasons why broadband – in particular fixed broadband – remains unaffordable to large segments of the population. For these income groups, therefore mobile broadband represents a more affordable alternative.²⁵

Against this scenario, the effects of the ITA and the ITA expansion on the costs of mobile phones and other devices connecting to the Internet can contribute to making access to the Internet more affordable and increasing connectivity. The potential economic and social impact deriving from Internet access and the role of technology in reducing poverty and promoting social inclusion have also been recognized by the United Nations, which have included universal and affordable access to the Internet as one of their Sustainable Development Goals.

F. The ITA facilitates implementation of the SDGs

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), with associated targets, which are a call for action to improve the lives of people everywhere.²⁶

Several SDGs refer directly or indirectly to ICT and technology. In particular, SDG 9, “Build resilient infrastructure, promote sustainable industrialization and foster innovation”, calls for increased access to ICT, working towards “universal and affordable access to the Internet in least developed countries by 2020” (see Box 5.3). The achievement of Goal 9 can be expected to have spill-over effects on other SDGs which can clearly benefit from innovation deriving from technological development and access to more affordable ICT goods and internet services, including but not limited to poverty reduction (Goal 1), quality education (Goal 4), clean energy (Goal 7), decent work and economic growth (Goal 8) and reduced inequalities (Goal 10). Guatemala’s “Programa Valentina” presented in Chapter 1 describes some of these links.²⁷

Under SDG 9, ICT is considered by the UN as “basic infrastructure”, like roads, sanitation, electricity and water. As basic ICT infrastructure remains insufficient in many developing economies, one of the targets of SDG 9 (i.e. Target 9.C) focuses on the need to increase access to ICT and the Internet, as measured by the percentage of the population covered by different mobile technologies. The main objectives are to increase access to ICT significantly and to strive to provide universal and affordable access to the Internet in least-developed economies by 2020.

Making the Internet universally accessible and affordable is also key to closing the remaining digital divide between developed and developing economies – and particularly LDCs – as well as between different regions within individual economies. Figures from ITU (2016) show that close to one out of two (47 per cent) people in the

BOX 5.3 UN Sustainable Development Goal 9 – ICT-related targets

- “Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing states”
- “Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities”
- “Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020”.

world are using the Internet, but only one out of seven people in LDCs.²⁸ According to World Bank (2016), the theme of which was digital dividends” (i.e. the broader development benefits that may result from using digital technologies), in Africa the richest 60 per cent of the population is almost three times more likely to have Internet access than the bottom 40 per cent, and the young and urban have more than twice the access of older and rural citizens. Among those connected, digital capabilities vary greatly. In the European Union, three times more citizens use online services in the richest economies than in the poorest, with a similar ratio of three to one between the rich and the poor within each economy.

World Bank (2016) also suggests that if digital technologies are to benefit everyone everywhere, it will be necessary to close the remaining digital divide, especially in Internet access. But greater digital adoption will not be enough. To get the most out of the digital revolution, economies also need to work on what the World Bank (2016) calls the “analogue complements” for a digital economy,²⁹ which are: a business environment where firms can leverage

the internet to compete and innovate for the benefit of consumers; better and more responsive education and training to improve workers’ skills to take advantages of the new economy and overcome the job displacement and job losses that can derive from technological change; and accountable institutions that effectively use the Internet to empower its citizens and deliver services.

In this context, participation in the ITA and the ITA expansion could be one of the drivers to the removal of barriers to Internet access and act as an important enabler for the diffusion and adoption of technology and innovation, which could contribute to helping achieve universal and affordable access to the Internet.

Endnotes

- 1 See Chapter 2.
- 2 See ITU (2016).
- 3 In economic and statistical analysis, the scope of what digital economy comprises may not be fully clear. However, it is certain that in the era of digitization, information and communication technology, especially the Internet, defines the characteristics of services innovation and provides new impetus to trade.
- 4 Source: http://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=1466&Sitemap_x0020_Taxonomy=UNCTAD%20Home;#2149;#UNCTAD
- 5 See Ahmed and Aldonas (2015).
- 6 See Ezell (2012a), page 4.
- 7 See Ezell and Wu (2017), page 13.
- 8 See Ahmed and Aldonas (2015), page 4.
- 9 Ezell (2012a) notes that “[b]ecause ICT usage contributes greater benefits to economic growth, tariffs are particularly pernicious when applied to ICTs, hurting the nations that impose them by raising the cost of ICT goods and services, thus causing businesses (and individuals) to invest less in ICT, which lowers their productivity – and in the case of traded sectors – their competitiveness” (page 6).
- 10 See Milne (2006).
- 11 See the forthcoming WTO publication *Aid for Trade at a Glance 2017: Promoting trade, inclusiveness and connectivity for sustainable development*.
- 12 ITU (2016), page 11.
- 13 Idem.
- 14 Alliance for Affordable Internet (2017). The index is calculated using two separate scores: the first assesses infrastructure deployment and the policy and regulatory framework designed to facilitate it, and the second measures access in terms of the rate of adoption of broadband and the policy and regulations meant to promote access.
- 15 See Alliance for Affordable Internet (2016), page 15.
- 16 See OECD-WTO Aid for Trade monitoring exercise 2017, NGOs and Academia case story 3, <http://www.oecd.org/aidfortrade/casestories/casestories-2017/CS-03-A4AI-Affordable-Internet-in-Ghana.pdf>
- 17 According to the targets of the UN Broadband Commission for Digital Development, which in 2011 set the following target: “By 2015, entry-level broadband services should be made affordable in developing countries through adequate regulation and market forces (amounting to less than 5% of average monthly income)”. As reported by the ITU in its “ICT facts and figures 2016” (<https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf>), by the end of 2015, 83 developing economies and 5 LDCs had achieved the Broadband Commission’s affordability target, but in the majority of the world’s poorest economies, broadband was still unaffordable.
- 18 See OECD-WTO Aid for Trade monitoring exercise 2017, NGOs and Academia case story 5, <http://www.oecd.org/aidfortrade/casestories/casestories-2017/CS%2005-A4AI-Affordable-Internet-in-Myanmar.pdf>
- 19 See Ezell and Atkinson (2010).
- 20 See Deloitte LLP and Facebook Inc. (2014).
- 21 See Deloitte LLP and Facebook Inc. (2014).
- 22 See <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf>
- 23 See ITU (2016), page 13.
- 24 See World Bank (2016), page 16.
- 25 Looking in more detail at the effective usage of mobile phones, ITU (2016) shows that the number of Internet users remains well below the number of people with network access, with 3.9 billion people globally still offline.
- 26 <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>
- 27 See page 17.
- 28 See <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf>
- 29 See World Bank (2016), page 29.

Appendix: Methodological challenges and assumptions

As mentioned in Chapter 2, a number of technical assumptions were made for the analysis of trade and tariff data of ITA products. This was also the case for the data used in the publication for the 15th Anniversary of the ITA.¹

A. Definition of product categories

The ITA does not differentiate products in its coverage beyond Attachment A (with two sections) and Attachment B. Although there are many ways in which these products could be classified for analytical purposes, the Secretariat used the following seven categories: (1) computers and calculating machines; (2) telecommunication equipment; (3) semiconductors; (4) semiconductor manufacturing equipment; (5) data storage media and software provided on physical media; (6) instruments and apparatus; and (7) parts and accessories. It should be noted that the last category includes all parts and accessories of all products falling within the ITA – including parts and accessories of semiconductor manufacturing equipment. Grouping ITA products into categories is not an exact science, so the figures presented in the study should be interpreted with caution. Also, the different amendments to the HS impacted each of these categories differently, as explained below.

B. Amendments to the HS

The product coverage of the ITA was largely based on HS1996. However, since then the WCO introduced a series of amendments to the nomenclature (i.e. the HS2002, the HS2007, the HS2012, and lately the HS2017). The latest amendment that entered into force on 1 January 2017 was not taken into account in this publication.

Not all HS amendments affected the subheadings covered by the ITA to the same degree. Figure A.1 shows that while HS2002 amendments only affected a handful of HS1996 subheadings, the introduction of HS2007 amendments was the most important, concerning 96 of the 163 HS2002 subheadings. Indeed, one of the major amendments to the HS in 2007 related to ITA products. More than half of the

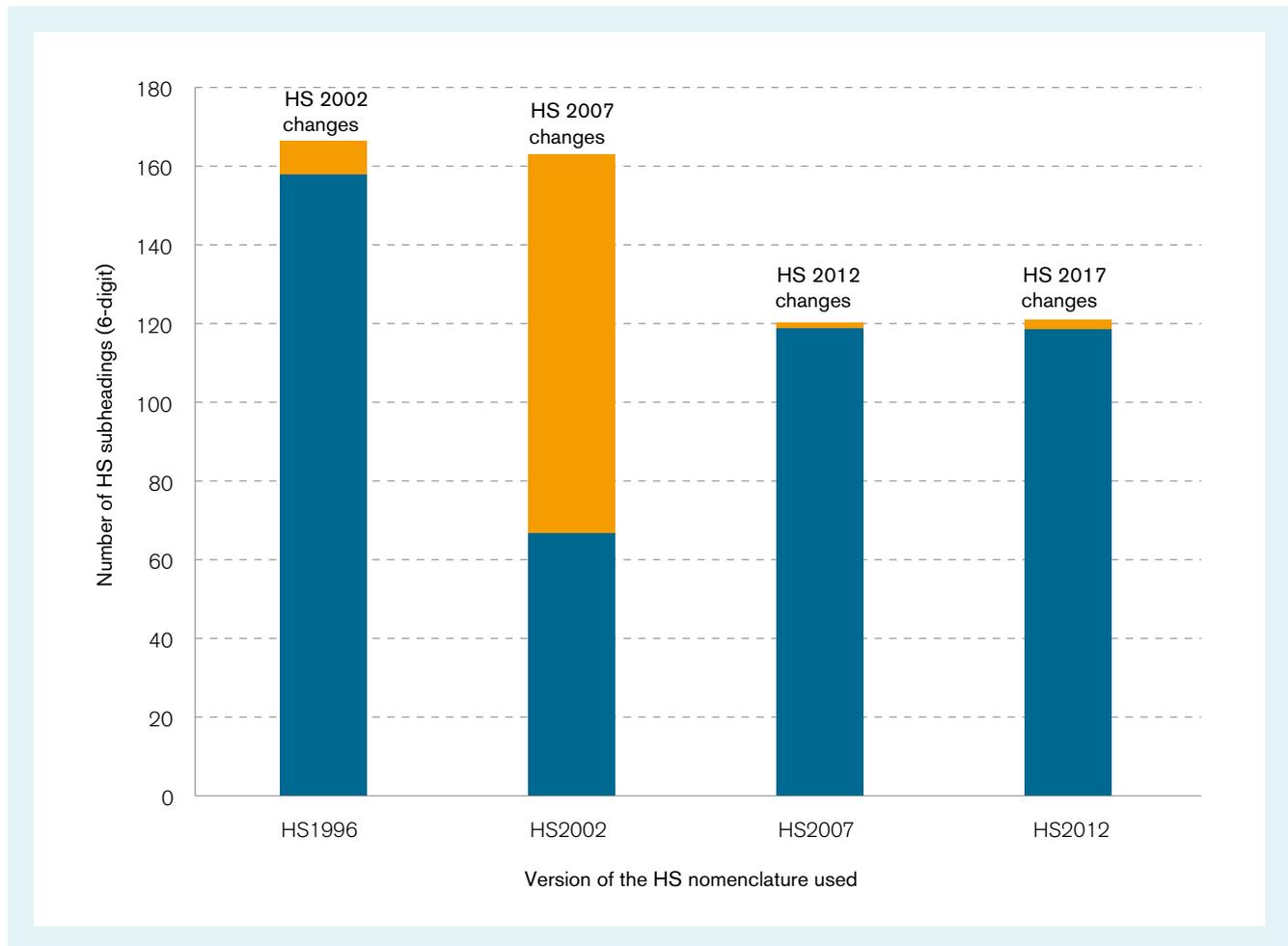
subheadings affected concerned semiconductor manufacturing equipment (29 subheadings) and parts and accessories (28 subheadings). Based on the indicative correlation tables between highlighting the changes from one nomenclature to the other,² it would appear that the HS2012 would only have a marginal impact on the classification of ITA products expressed in the HS2007 nomenclature. Similarly, the introduction of the HS2017 would also affect only two subheadings covered by the ITA (HS 852341 and 852349).

C. Partial coverage of HS subheadings

The product coverage of Attachment A of the Annex to the ITA is defined based on the 1996 version of the HS, and 95 of these 190 items were defined beyond the HS subheading (i.e. 6-digit) level. The use of specific subcategories within a subheading was identified by adding an “ex” next to the relevant code – the so-called “ex-outs”. Of the 155 distinct HS1996 subheadings listed, 60 provide for one or more ex-outs (e.g. nine different ITA items are listed as ex-outs of HS1996 subheading 8479.89). Contracting parties to the HS can, but are not obliged to, create subdivisions of HS subheadings in their national or regional nomenclatures (i.e. at the 8-digit level or higher). Reasons for introducing national subdivisions vary widely and include imposing different tariffs. Cognizant of this fact, Paragraph 2 of the Annex to the ITA provides that “each participant shall promptly modify its *national tariff schedule* to reflect the modifications it has proposed [to its WTO schedule], as soon as they have entered into effect” (emphasis added). This does not mean, however, that all participants identified all ITA items at the national or regional level – a situation that considerably complicates a cross-country comparison and analysis of trade and MFN applied tariffs.

To further complicate calculations, some participants tend to use the same tariff code with a different product description over the years, making cross-year comparisons labour intensive. Another particularly difficult, but common, situation faced in the analysis of the data was how to treat situations where an ITA item

■ **Figure A.1: Effect of HS amendments on subheadings covered by the ITA**



Source: WTO Secretariat.

encompasses one or two different product subcategories within an HS subheading, including products not covered by the Agreement, but the participant does not differentiate them in their national nomenclature.

To find a solution to these problems, the Secretariat implemented a mixed approach whereby it defined a list of HS1996 subheadings that includes all the fully covered subheadings plus some of those with ex-outs. The same approach was used to define another list of HS2007 subheadings. The Secretariat estimates that this approach leads to a significant underestimation. Thus, while the approach chosen for this study is certainly not perfect, it yields a considerably more accurate picture of world trade in IT products.³

D. Attachment B items

Another major problem that complicated a trade and tariff analysis of ITA products was the divergence in the

classification of the 55 Attachment B items. As explained in Chapter 3, the ITA Committee adopted two decisions: the first decision concerned the common classification of 18 Attachment B items in HS1996 and the second concerned the classification of 15 items in HS2007.⁴ Therefore, out of the original 55 items, only 22 Attachment B items remain without a common HS classification by all ITA participants. The majority of these relate to parts and accessories of ITA products, most of which include semiconductor manufacturing equipment and their parts.

While the two decisions of the ITA Committee have helped to simplify the calculations, the problem remained for those items 22 Attachment items without a HS common classification. One possible approach to deal with this situation was to examine the individual commitments made in each of the relevant WTO schedules of concessions and the national tariff schedules involved. While this approach was used in this publication to calculate the exact average bound tariffs, it was considered to be a

cumbersome approach with respect to most-favoured-nation (MFN) applied tariffs and trade figures, mainly because it would have involved preparing detailed correlation tables from one HS nomenclature to another for the schedule of each ITA participant in order to keep track of the changes affecting ITA products. For this reason a “first model list” was developed with a total of 166 subheadings in the HS1996 nomenclature – 95 of which are fully covered and 71 have partial coverage.⁵

While the use of a model list in HS1996 considerably simplified the analysis, the approach may well lead to apparently inconsistent results when comparing the information in the WTO schedules and the applied tariffs.

For example, there are cases where an HS subheading is covered by the first model list, but the ITA participant shows dutiable applied rates for all national tariff lines breakdown within the subheading. Whether or not the participant is in breach of the relevant concession depends, *inter alia*, on whether or not that subheading was included in the participant’s schedule of concessions and if so, the manner in which it was reflected therein. Such comparison is further complicated because most WTO schedules of concessions are in an earlier HS version as compared to the most recent applied tariffs and trade data. In general, latest available applied tariffs and the corresponding trade statistics used in this publication are based on the HS 2012 version.

Endnotes

- 1 See WTO (2012), page 96.
- 2 The correlation tables constitute a guide published by the WTO Secretariat and their sole purpose is to facilitate implementation of the Harmonized System. See WTO official documents G/MA/W/105 and G/MA/W/122.
- 3 See WTO (2012), page 98.
- 4 See official WTO documents G/IT/27 and G/IT/29. More information is provided in Chapter 3.
- 5 WTO internal document JOB(07)/96.

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ITA: List of participants

(as of 19 May 2017)

The ITA currently has 53 participants representing 82 WTO members. The European Union is counted as one, as is the customs union between Switzerland and Liechtenstein.

| Participant | Date of participation | Participant | Date of participation |
|------------------------|--------------------------|---------------------------|-----------------------|
| Afghanistan | 19 March 2014 | Georgia | 28 September 1999 |
| Albania | 28 September 1999 | Guatemala | 22 December 2005 |
| Australia | 26 March 1997 | Honduras | 20 October 2005 |
| Bahrain, Kingdom of | 16 July 2003 | Hong Kong, China | 26 March 1997 |
| Canada | 26 March 1997 | Iceland | 26 March 1997 |
| China | 24 April 2003 | India | 26 March 1997 |
| Colombia | 27 March 2012 | Indonesia | 26 March 1997 |
| Costa Rica | 26 March 1997 | Israel | 26 March 1997 |
| Dominican Republic | 7 July 2006 | Japan | 26 March 1997 |
| Egypt | 24 April 2003 | Jordan | 17 December 1999 |
| El Salvador | 20 May 1997 | Kazakhstan | 27 July 2015 |
| European Union | 26 March 1997 | Korea, Republic of | 26 March 1997 |
| <i>Austria</i> | <i>26 March 1997</i> | Kuwait, State of | 13 September 2010 |
| <i>Belgium</i> | <i>26 March 1997</i> | Kyrgyz Republic | 24 February 1999 |
| <i>Bulgaria</i> | <i>1 January 2007</i> | Macao, China | 26 March 1997 |
| <i>Croatia</i> | <i>28 September 1999</i> | Malaysia | 26 March 1997 |
| <i>Cyprus</i> | <i>3 October 2000</i> | Mauritius | 6 July 1999 |
| <i>Czech Republic</i> | <i>26 March 1997</i> | Moldova, Republic of | 29 November 2001 |
| <i>Denmark</i> | <i>26 March 1997</i> | Montenegro | 9 July 2012 |
| <i>Estonia</i> | <i>26 March 1997</i> | Morocco | 14 November 2003 |
| <i>Finland</i> | <i>26 March 1997</i> | New Zealand | 26 March 1997 |
| <i>France</i> | <i>26 March 1997</i> | Nicaragua | 20 October 2005 |
| <i>Germany</i> | <i>26 March 1997</i> | Norway | 26 March 1997 |
| <i>Greece</i> | <i>26 March 1997</i> | Oman | 22 November 2000 |
| <i>Hungary</i> | <i>1 May 2004</i> | Panama | 23 June 1998 |
| <i>Ireland</i> | <i>26 March 1997</i> | Peru | 13 November 2008 |
| <i>Italy</i> | <i>26 March 1997</i> | Philippines | 25 April 1997 |
| <i>Latvia</i> | <i>24 February 1999</i> | Qatar | 3 July 2013 |
| <i>Lithuania</i> | <i>6 July 1999</i> | Russian Federation | 13 September 2013 |
| <i>Luxembourg</i> | <i>26 March 1997</i> | Saudi Arabia, Kingdom of | 20 October 2005 |
| <i>Malta</i> | <i>1 May 2004</i> | Seychelles | 17 October 2014 |
| <i>Netherlands</i> | <i>26 March 1997</i> | Singapore | 26 March 1997 |
| <i>Poland</i> | <i>26 March 1997</i> | Switzerland-Liechtenstein | 26 March 1997 |
| <i>Portugal</i> | <i>26 March 1997</i> | Chinese Taipei | 26 March 1997 |
| <i>Romania</i> | <i>26 March 1997</i> | Tajikistan | 2 March 2013 |
| <i>Slovak Republic</i> | <i>26 March 1997</i> | Thailand | 26 March 1997 |
| <i>Slovenia</i> | <i>14 June 2000</i> | Turkey | 26 March 1997 |
| <i>Spain</i> | <i>26 March 1997</i> | Ukraine | 24 January 2008 |
| <i>Sweden</i> | <i>26 March 1997</i> | United Arab Emirates | 10 March 2007 |
| <i>United Kingdom</i> | <i>26 March 1997</i> | United States | 26 March 1997 |
| | | Viet Nam | 6 September 2006 |

Notes: In 1997, when the European Union became an ITA Participant, it had 15 member states: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom. The following economies joined the ITA individually in 1997: Czech Republic, Estonia, Poland, Romania and Slovak Republic. Bulgaria, Croatia, Cyprus, Latvia, Lithuania and Slovenia joined in or after 1998. Hungary and Malta joined the ITA through the EU enlargement in 2004.

Abbreviations

| | | | |
|---------------|---|----------------|---|
| ADI | Affordability Drivers Index | MOS | Metal oxide semiconductors |
| APEC | Asia-Pacific Economic Cooperation | NAFTA | North American Free Trade Agreement |
| APTA | Asia-Pacific Trade Agreement | NAMA | Non-agriculture market access |
| ASEAN | Association of Southeast Asian Nations | NES | not elsewhere specified |
| B2B | Business-to-business | NTMs | Non-tariff measures |
| B2C | Business-to-consumers | NTBs | non-tariff barriers |
| BASIS | Bangladesh Association of Software and Information Services | NTP | Ghana's National Telecoms Policy |
| BEC | United Nations Classification by Broad Economic Categories | OECD | Organisation for Economic Co-operation and Development |
| BPO | Business process outsourcing | OPTIC | L'Organisation des Professionnels des TIC du Sénégal |
| CET | Common External Tariff | OTAM | Outsourcing and Telecommunications Association of Mauritius |
| CTS | WTO Consolidated Tariff Schedules | PT | Preferential tariff |
| EAC | East African Community | QR Code | Quick Response Code |
| EACU | Eurasian Customs Union | SAFTA | South Asian Free Trade Area |
| ECOWAS | Economic Community of West African States | SDGs | UN Sustainable Development Goals |
| EMC | Electromagnetic compatibility | SDoC | Supplier's declaration of conformity |
| EMI | Electromagnetic Interference | SME | Small and medium-sized economy |
| FTA | Free trade agreement | TiVA | Trade in value added |
| GATT | General Agreement on Tariffs and Trade | TV | Television |
| GCC | Gulf Cooperation Council | TWG | Technical Working Group |
| GNI | Gross national income | UN | United Nations |
| GVC | Global value chain | UNCTAD | United Nations Conference on Trade and Development |
| HS | Harmonized System | VINASA | Vietnam Software Association |
| IBPAP | Information Technology and Business Process Association of the Philippines | WCO | World Customs Organization |
| ICT | Information and communications technology | WTO | World Trade Organization |
| ICTSD | International Centre for Trade and Sustainable Development | | |
| IDB | Inter-American Development Bank | | |
| IEC | International Electrotechnical Commission | | |
| IECEE | IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components | | |
| ISIC | International Standard Industrial Classification | | |
| IT | Information technology | | |
| ITA | Information Technology Agreement | | |
| ITC | International Trade Centre | | |
| ITI | Information Technology Industry Council | | |
| ITIF | Information Technology and Innovation Foundation | | |
| ITU | International Telecommunication Union | | |
| JEIDA | Japanese Electronic Industry Development Association | | |
| KITOS | Kenya IT and Outsourcing Service | | |
| LED | Light-emitting diode | | |
| LDC | Least-developed country | | |
| LTE | "Long Term Evolution" technology | | |
| MCO | Multi-component integrated circuit | | |
| MCP | Multi-chip integrated circuit | | |
| MFN | Most-favoured nation | | |

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20 Years of the Information Technology Agreement

Over the past 20 years, the Information Technology Agreement (ITA) has increased worldwide access to high-tech goods, such as computers, mobile phones and semiconductors. It has also contributed to greater access to the Internet and the growth of the digital economy, creating new opportunities for businesses and individuals in both developed and developing economies.

Finalized at the first WTO Ministerial Conference in 1996, the ITA commits its participants to eliminating tariffs on a wide range of IT products with an annual value of approximately US\$ 1.7 trillion. To mark the 20th anniversary of the ITA, this publication analyses the impact of the ITA on its participants and on worldwide trade in IT products. It demonstrates how the Agreement has not only made high-tech products more affordable but has also helped to promote innovation and to support developing economies' integration into global production networks.

The publication also reviews new developments, such as the landmark deal concluded in 2015 to eliminate tariffs on an additional 201 IT products valued at over \$1.3 trillion per year. Finally, it highlights what still needs to be done to meet the UN's Sustainable Development Goal of providing universal and affordable access to the Internet so that the benefits of the digital revolution can be enjoyed by all.



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