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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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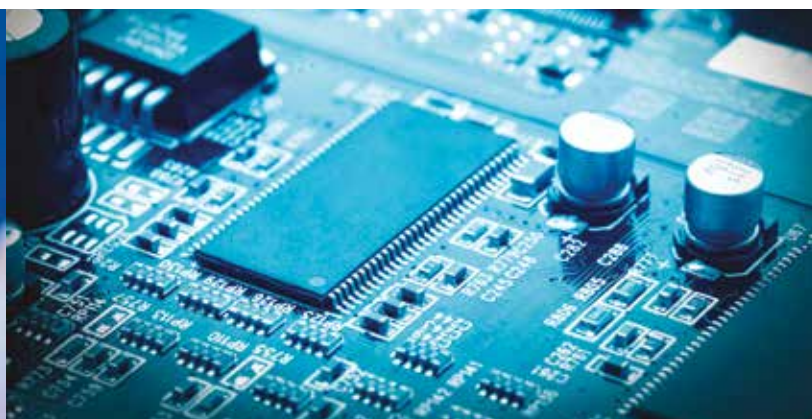
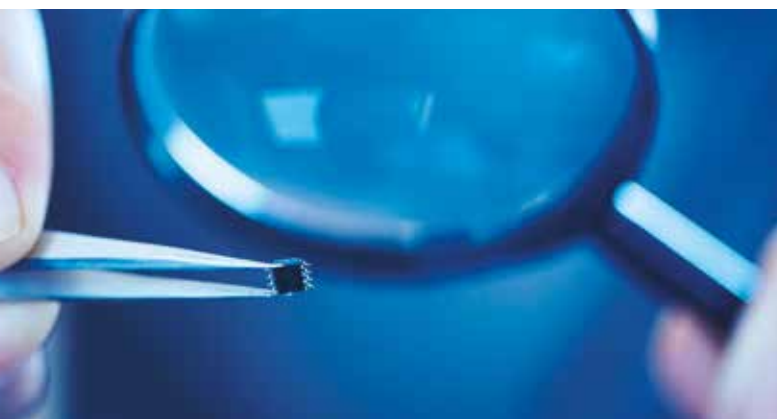
Foreword by WTO Director-General Roberto Azevêdo

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 that reads "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**.

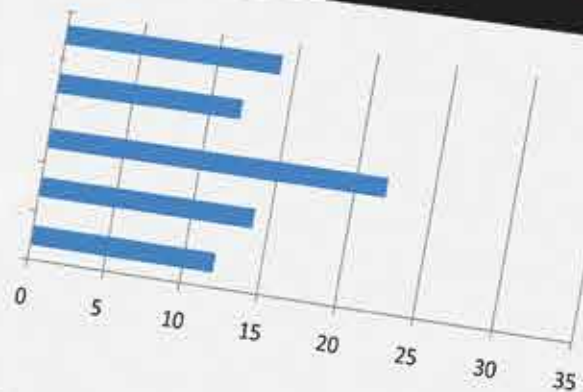
▪ Despite a reduction in prices, the cost of ICT goods continues to represent a barrier to accessing technology. In economies that are not participants to the ITA, tariffs are as high as **45 per cent** on certain ICT imports. For products which are now covered by the ITA expansion, tariffs can go up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

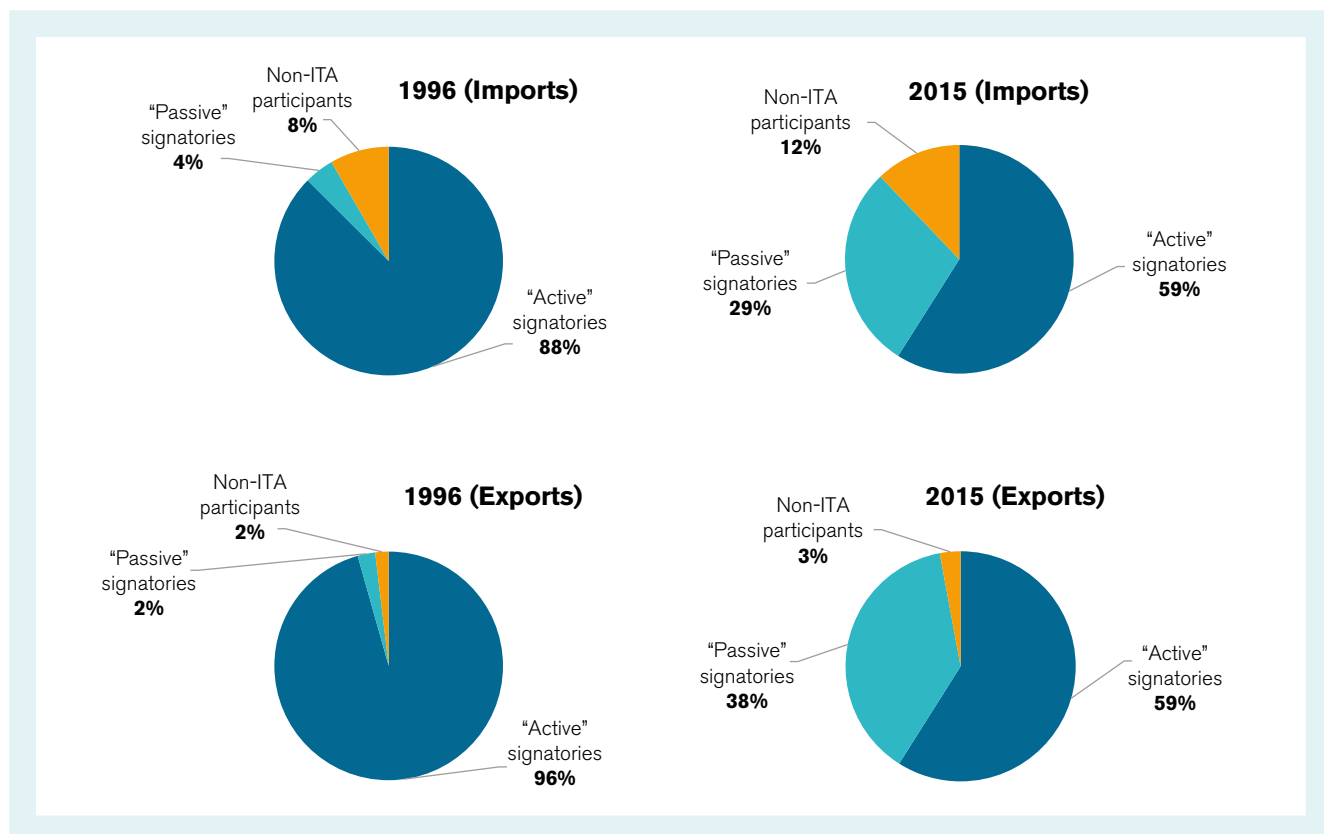
"active" and "passive" signatories. On the export side, "active" ITA signatories are estimated to have experienced a decline of about 7 per cent after accession, mainly due to a decline in their exports of final goods rather than on intermediate goods. This seems to be in line with the value chain literature, 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.