



SUPPORTING  
ECONOMIC  
TRANSFORMATION

# E-COMMERCE: THE IMPLICATIONS OF CURRENT WTO NEGOTIATIONS FOR ECONOMIC TRANSFORMATION IN DEVELOPING COUNTRIES

Alberto F. Lemma

December 2017

## Acknowledgements

We are grateful to Vanessa Head, Jonny Richards, Rosie Seville and their colleagues at DFID for discussions and comments. Thanks to Sheila Page for the suggestions and peer review. All errors and omissions remain ours.

© SUPPORTING ECONOMIC TRANSFORMATION.

The views presented in this publication are those of the author(s) and do not necessarily represent the views of **DFID** or **ODI**.



# CONTENTS

List of acronyms	iv
Executive Summary	v
1. Introduction	1
1.1. E-commerce and Economic Transformation	1
1.2. How do we evaluate impact?	2
2. E-commerce in developing countries	2
3. WTO E-Commerce proposals	6
3.1. A summary of e-commerce in the WTO	6
3.2. Status quo of the WTO proposal impact areas	9
3.2.1. Tariff removals	9
3.2.2. Data localisation	11
3.2.3. Consumer data privacy and protection	12
4. Pathways to economic transformation	13
4.1. Tariff reductions	13
4.2. Forced data localisation	14
4.3. Consumer data privacy and protection	14
5. Impact assessment	15
5.1. Tariff removals and reductions	18
5.2. Data localisation	20
5.3. Consumer data privacy and protection	22
6. Conclusions	23
References	25
Annex 1: Services Trade Mode Classifications	28
Annex 2: Estimating digitisable product tariff revenues as a proportion of total tariff revenues, developing countries, for 2013	28
Annex 3: Regression Results – High-Technology Goods and Tariffs	31
Annex 4: Improved Access to the Internet	32

## LIST OF ACRONYMS

B2B	Business to Business
B2C	Business to Consumers
CIS	Commonwealth of Independent States
EC	European Commission
EU	European Union
FDI	Foreign Direct Investment
FED	Friends of E-Commerce for Development
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IPR	Intellectual Property Rights
IT	Information Technology
ITA	Information Technology Agreement
ITIC	Information Technology Industry Council
ITU	International Telecommunication Union
LDC	Least Developed Country
MENA	Middle East and North Africa
MFN	Most Favoured Nation
MIKTA	Malaysia, Indonesia, Korea, Turkey and Australia
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Development
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UNCTAD	UN Conference on Trade and Development
US	United States
WITS	World Integrated Trade Solution
WTO	World Trade Organization

## EXECUTIVE SUMMARY

The paper provides an assessment of the potential impacts of e-commerce focused country (and country agglomeration) proposals made to the World Trade Organization on economic transformation in developing countries. E-commerce, in the context of these discussions, is intended as trade in goods or services that are generated or facilitated by electronic means. E-commerce can relate to physical goods, digital goods or are a part of the digital economy i.e. data as a good or service. Given the complications that arise in measuring quantitative changes to e-commerce, the paper uses changes in the trade of ICT goods as a proxy. For those measures where quantitative analysis was not possible, the paper reviewed and assessed academic and grey literature sources, subsequently cross-referencing these to the changes identified in the e-commerce proposals then mapping them to developing country economic transformation implications. The paper broadly defines developing countries as those within the low and lower-middle income country groups as set out by the World Bank in 2017.

The definition of economic transformation is the change in productive structures that allows countries to reallocate resources from less productive to more productive activities – moving to more productive activities within a sector or moving production to more productive sectors. The paper adjusts this definition allow the use of available proxy impact metrics for example whether the WTO proposals help increase the import of ICT-related goods or services to promote productive higher-value e-commerce activities within a country etc. Given these methodological definitions and limits, the paper first identifies the main e-commerce proposal strands, for each one it describes the current status quo, the impact channel of the proposed changes and assesses potential impacts on developing countries. The paper finds that e-commerce proposals to the WTO can be broadly classified into three main strands.

The first is a reduction in tariff rates on e-commerce facilitated goods and an extension of the moratorium on tariffs on electronic transmissions. In terms of the tariff reduction on goods, no real data on e-commerce trade in developing countries exist, hence it is not possible to calculate existing tariffs on e-commerce goods. To estimate the impact of reduced or removed tariffs, the paper uses the tariffs imposed on the High Technology Goods classification (ISIC rev. 3) as a proxy and finds that a reduction on import tariffs by 1% can lead to an increase of between US\$2 billion to US\$3 billion (in nominal terms) in imports and exports of such products. The paper does not explore the effect of an extension (or removal) of the moratorium as no data on electronic transmissions is available that can help provide a counter-factual argument.

The second strand focuses on the removal of data localisation requirements. Data localisation is intended as the forced setting up of data centres (such as servers) within mandating countries. Whilst entities may choose to voluntarily localise their data, this decision is usually a commercial one. Data localisation, however, mandates such an investment and may increase operational costs of affected firms. Initial studies on data localisation issues have shown that where these have been applied (i.e. US, China, Russia, the EU) these have negatively affected growth and may affect developing country firm capacity to set up e-commerce (such as digital goods and services provision) operations in implementing markets.

The third strand calls for strengthened consumer data protection and privacy laws. While a majority of developing countries already have electronic transaction laws in place, they lag in terms of consumer privacy and data protection measures vis-à-vis developed countries. Current policy and technical capabilities in developing countries may constrain their implementation, however implementation could be worth doing as it could promote greater consumer confidence in e-commerce enabled markets, however it may also stimulate further use of data localisation measures as these are often implemented under the auspice of enhanced consumer and data protection.

Even though the proposals may have a positive transformative impact, it is important to note that actual impacts cannot be assessed due to a lack of quantifiable e-commerce data. One of the main implications of this paper is that it is therefore imperative that all countries agree on, and use, a standard (or multiple standards) to measure trade in e-commerce, should they decide such knowledge is worth the cost.

# 1. INTRODUCTION

This paper aims to assess what the implications of e-commerce proposals to the World Trade Organization (WTO) would be for economic transformation in developing countries. It assesses these impacts using available data and identifies three main impact channels: 1) reductions of tariffs on e-commerce goods; 2) changes to data localisation requirements; and 3) implementation of consumer data protection and privacy laws. The paper identifies some positive quantitative and qualitative impacts on developing countries from all three main proposed changes; however, the paucity of data covering e-commerce is an issue that negatively affects capacity to measure the strengths of these impacts.

The paper is divided into five sections. This section briefly highlights the goals of the paper and the methodology behind it. Section 2 provides some background on e-commerce in relation to developing countries, attempting to superficially assess its importance and the extent of developing country participation in the sector. Section 3 illustrates and summarises the different e-commerce proposals put forward to the WTO. Section 4 explores the impact channels of these proposals. Section 5 maps these proposals to impacts on developing countries, using a mixture of quantitative and qualitative methods. Section 6 concludes with a summary of the results and some recommendations on future data and analysis.

## 1.1. E-commerce and Economic Transformation

E-commerce can be defined as trade in goods or services that is, at the moment, broadly defined as either generated or facilitated by electronic means. E-commerce can relate to products that can be defined as part of the traditional physical production system, products that used to be physical but that have been replaced by digital goods or products that belong to what can be defined as the digital economy – where data itself is either a good or used to provide a service, through use and interaction of data-gathering platforms (such as Google or Facebook). The definition of activities and goods that are within the e-commerce sphere does not stop at these ‘simpler’ items. There are not only various hybrid products that can mix and match physical and digital processes (i.e. software embedded within a physical good) but also different ways of gaining access to these goods – that is, different types of services trade, such as business to consumers (B2C), business to business (B2B), etc.

The World Bank (2016) discusses the concept of ‘digital dividends’, whereby increased use of digital technologies can have positive impacts on growth, employment and services. Use of digital technologies enables a host of significant transaction cost savings, as the movement of products and information that may once have required physical transportation now seamlessly (and immediately) occurs through the internet or through localised networks. Information networks have also expanded, allowing for interactions between previously separate actors (i.e. between businesses, governments, citizens and others across multiple borders). The information and communication technology (ICT) sector is itself an important contributor to productivity. For example, the Organisation for Economic Co-operation and Development (OECD) (2015) shows that labour productivity in the ICT sector (within OECD countries) is 79% higher than productivity levels in other sectors and is estimated to have raised total labour productivity levels by between 2% (in Hungary) and 4% (in Ireland).

Arora and Gambardella (2005) find the ICT sector is important to the economy as a whole, providing inputs into all sectors, hence it can be a driver of growth in developing countries. However, they also raise the issue that software can easily be traded across borders, thus the use of digital goods does not necessarily reflect growth in a country’s ICT sector. This has an important theoretic implication for this paper, that measuring the size of a country’s ICT sector may provide a good indication of the potential size of the volume of e-commerce but may exclude the accounting of countries where software and capital is imported. In this pursuit, assessment of the importance of e-commerce is restricted to the use of data that look only at trade flows, as there are no complete domestic and international e-commerce data available (OECD and WTO, 2017).

## 1.2. How do we evaluate impact?

Given the complications that arise in the definition of e-commerce, it is important to set a framework of analysis for the paper to follow. The first issue relates to how the paper measures e-commerce in reference to economic transformation. Given the number of data sources required to compile the information necessary for this paper, it is important to note that there will be some divergence in data representation. This is especially the case for developing countries, for which data paucity in general and lack of data on e-commerce in particular mean we need to use alternative measures as a proxy for e-commerce.

Within this context, changes to e-commerce are in quantitative terms, measured by one of two inter-related indicators: changes in the trade of ICT services and changes in the trade of ICT goods.<sup>1</sup> For those measures where quantitative analysis was not possible, we reviewed and assessed academic and grey literature sources, subsequently cross-referencing these to the changes proposed in the e-commerce proposals then mapping them to developing country economic transformation implications.

As the paper assesses the potential and hypothetical implications of e-commerce proposals put forward to the WTO for developing countries, we define developing countries as those falling into the low- and lower-middle-income country classifications as used by the World Bank in 2017<sup>2</sup> – that is, all countries where the average gross domestic product (GDP) per capita is equal to, or less than, \$3,955. Even though the paper looks at the effects of WTO proposals, we choose not to use the WTO definition of a developing country, as countries can self-assess whether they fall within this category, which removes any potential for arbitrary comparisons between countries in different income groups. Given the number of data sources used, some country aggregation measures may also be divergent from our developing country classifications. We have tried to maintain the integrity of the definition where possible.

The final part of the framework deals with what the paper considers to be ‘economic transformation’. Our general definition of economic transformation is the change in productive structures that allows countries to reallocate resources from less productive to more productive activities – moving to more productive activities within a sector or moving production to more productive sectors. Within the context of this paper, we adjust this definition in order to allow us to use proxy (e.g. available) impact metrics – namely, whether the proposals help increase the import of ICT-related goods or services to promote productive higher-value e-commerce activities within a country, whether they help increase the export of ICT-related goods or services (with associated increases in competitiveness and productivity) and what impacts the proposals may have on the growth rates of affected economies. Given the lack of data, we cannot estimate changes in employment or more specific inter-sectoral movements such as increased activity in the ICT sector or greater export of goods through ICT-enabled means.

## 2. E-COMMERCE IN DEVELOPING COUNTRIES

This section looks at where developing countries stand in terms of e-commerce and, more specifically, what the current situation is. The aim is to provide an overview of currently available e-commerce data for developing countries and set a baseline from which we can measure any of the WTO proposal impacts.

Although there are no real official statistics on developing country participation in e-commerce (UNCTAD, 2015), some surveys of private firms point out that, in 2016, e-commerce sales amounted to \$41 billion for Latin America and \$14.7 billion for Africa and the Middle East, both figures dwarfed by those of Asia, where sales amount to \$877.6 billion, with India contributing \$25 billion and Indonesia \$3.2 billion (Payvision, 2016). Global e-commerce for B2C sales shows a 20% increase between 2014

<sup>1</sup> Including any derivative measures such as the ISIC Rev. 3 classification of High Technology Goods.

<sup>2</sup> <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

and 2015, with significant increases in the Asia-Pacific (28.4%) region and the Middle East and North Africa (MENA) (18.6%),<sup>3</sup> indicating strong growth in what could be considered developing regions.

Table 1: Global B2C e-commerce volumes and volume change, 2014-2015

	2014 (US\$ bn)	2015 (US\$ bn)	Growth rate (%)
<b>World</b>	1,895.3	2,272.7	19.9
<b>Asia-Pacific</b>	822.8	1056.8	28.4
<b>North America</b>	572.5	644	12.5
<b>Europe</b>	446	505.1	13.3
<b>Latin America</b>	25.8	33	28
<b>MENA</b>	21.7	25.8	18.6

Source: Ecommerce Foundation (2016).

Estimates show that B2C sales through e-commerce in the Asia-Pacific region may grow from 28% of global market share in 2013 to 37% in 2018. The MENA region will also increase, though markedly less so, from 2.2% to 2.5%. According to the OECD and WTO (2017), the number of online buyers will increase by 70% in Asia and Oceania and those in the Middle East and Africa by 82% over the same period, both figures indicating a substantial potential increase in e-commerce participation by developing countries.

### Box 1: B2C and B2B

This paper implicitly discusses two main types of transactions: B2C and B2B transactions.

B2C stands for business to consumer; these are transactions that enterprises conduct with their clients – when seen through the e-commerce lens, typically through shopping websites (i.e. Amazon) – and are given significant attention owing to the consumer protection considerations that revolve around them.

B2B signifies business to business; these are transactions where enterprises trade (or exchange information) with one another and are estimated to account for 90% of all e-commerce transactions (in 2012). They can be carried out either through neutral online platforms or through *ad hoc* platforms that enterprises set up between themselves.

Source: WTO (2013).

More detailed information, tailored to the developing country definition that we use in this paper, shows a significant increase in the importance of ICT. The first set of indicators provides a picture of internet use by development level (Figure 1) and by region (Figure 2). The data in Figure 1 shows that developed countries have a higher fixed and mobile internet subscription base; of significance for this paper is that, since 2013 and 2014, the subscription rates for both 'developing countries' and 'least developed countries (LDCs)<sup>4</sup> have started to catch up rapidly. This is especially apparent when we look at mobile broadband subscriptions, where the promulgation infrastructure (i.e. repeater poles vs. hard lines) and

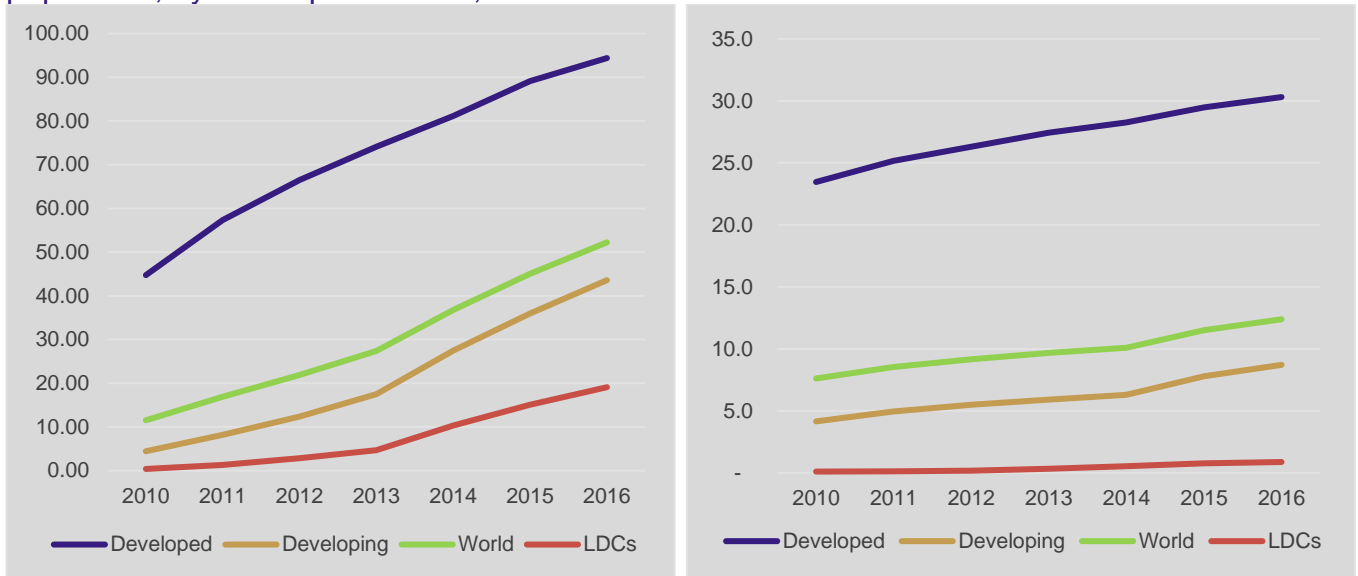
<sup>3</sup> The Ecommerce Foundation (2016) report does not include data for sub-Saharan Africa.

<sup>4</sup> As in the International Telecommunication Union (ITU) definition.



hardware required (cellular phones vs. personal computers) are much more accessible, cost and geography-wise, for these countries' inhabitants.

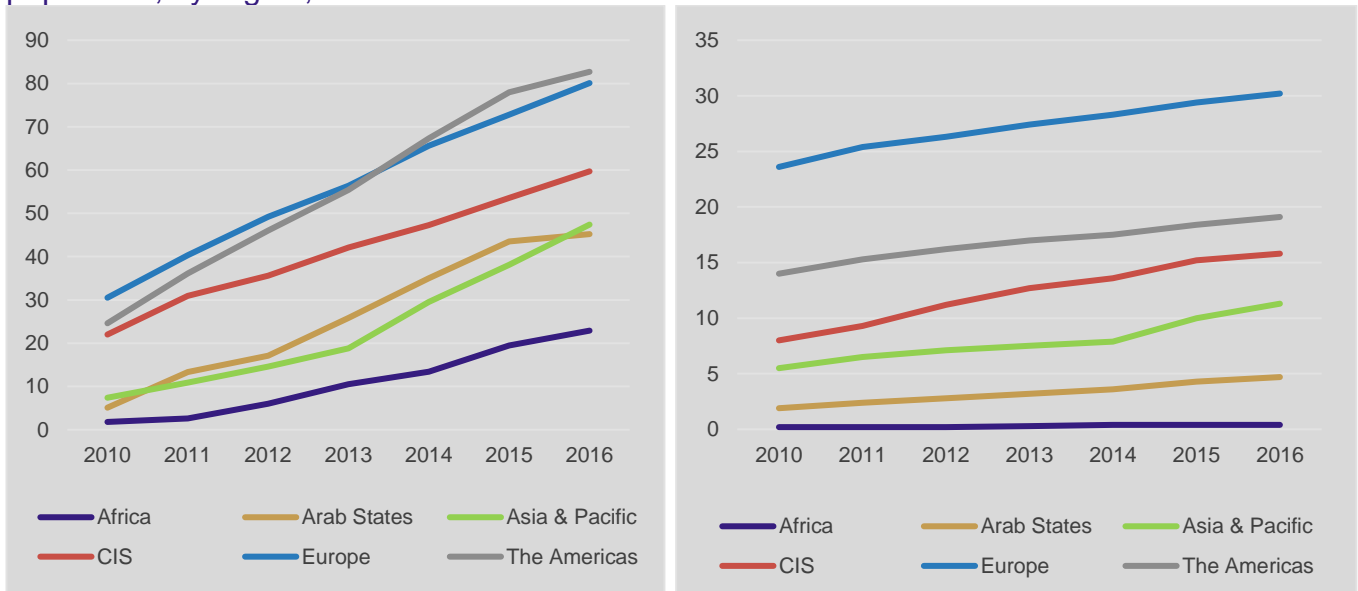
Figure 1: Active mobile broadband subscribers (left) and fixed line subscribers (right), per 100 population, by development level, 2010-2016



Source: ITU (2017).

Figure 2 presents the same information, this time disaggregated by geographic region. Here, we have Europe and the Americas (North and Southern America) leading usage rates, followed by the Commonwealth of Independent States (CIS) countries, with rapid catch-up by both Asian countries and Middle Eastern countries as well as (less rapid) catch-up by African countries.

Figure 2: Active mobile broadband subscribers (left) and fixed line subscribers (right), per 100 population, by region, 2010-2016

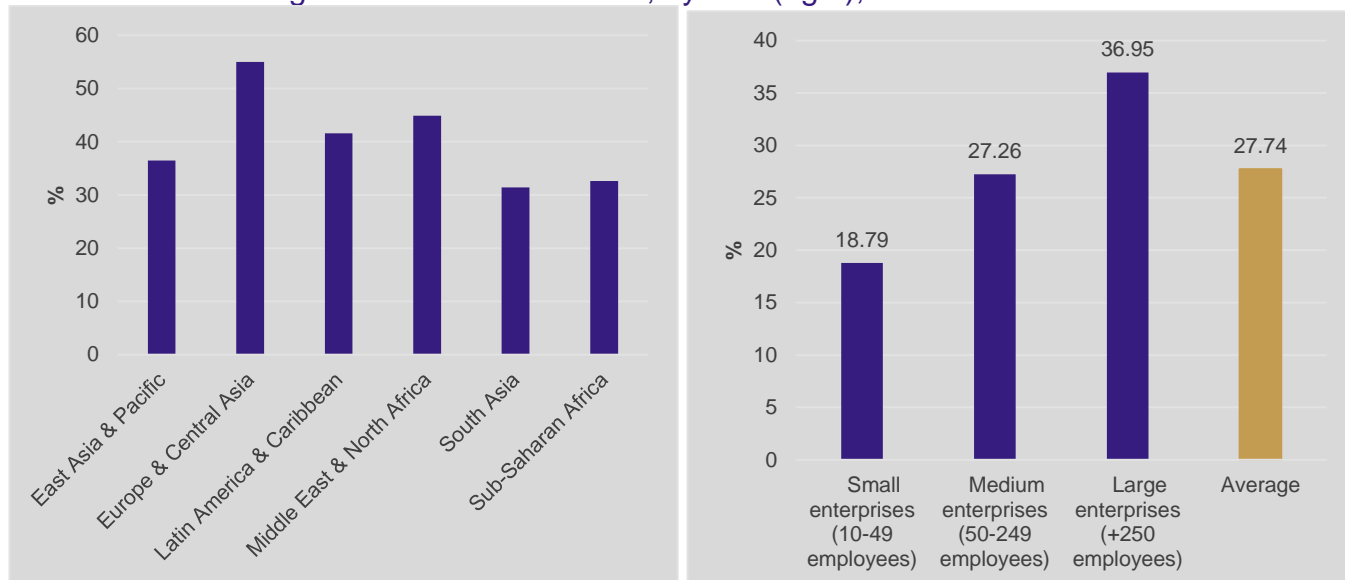


Source: ITU (2017).

The message of these two figures is that internet usage is rapidly converging across the globe. In terms of business usage, data (Figure 3, below) from the World Bank's Enterprise Surveys and from the UN Conference on Trade and Development (UNCTAD) show the percentage of firms, by geography, that have their own website – highlighting that approximately a third of firms in East and South Asia as well as in Sub-Saharan Africa make use of a website. The chart on the right in Figure 3 presents the

proportion of businesses, by size,<sup>5</sup> that receive orders over the internet. It not surprisingly shows that such activities tend to be undertaken mainly by larger firms, though it is important to note that nearly a fifth of small and a third of medium-sized enterprises do take orders over the internet.

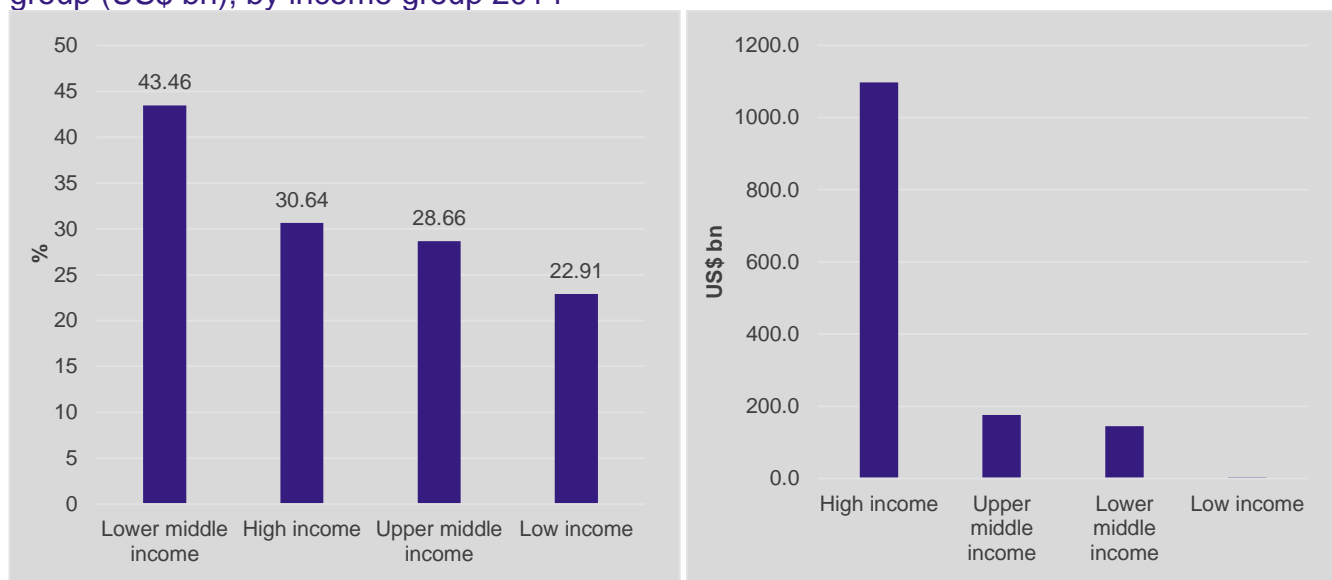
Figure 3: Proportion of firms with their own website, by region (left), and proportion of businesses receiving orders over the internet, by size (right), 2014-2015



Note: World Bank Enterprise Survey data aggregate, country surveys undertaken in different years (left chart). Source: World Bank Enterprise Surveys (2017) (left); UNCTADStats (2017) (right).

Figure 4 illustrates the importance of ICT service exports for lower-middle-income countries, where they represent 43.6% of total service exports, significantly more than for countries in other income groups. In terms of value export, however, the values of both low- and lower-middle income countries lag behind those of high-income countries.

Figure 4: ICT services as a proportion of total services exports (left) and ICT services by income group (US\$ bn), by income group 2014



Note: ICT services exports include computer and communications services (telecommunications and postal and courier services) and information services (computer data and news-related service transactions). Source: World Bank World Development Indicators (2017).

<sup>5</sup> Data disaggregated at the country level are not available.

### 3. WTO E-COMMERCE PROPOSALS

This section summarises and briefly discusses the various proposals the different country groups have put forward on e-commerce in the WTO. To understand where these discussions are located on the WTO negotiation timeline, we first provide a short summary of e-commerce within the organisation. We then present information on the *status quo* of these main impact issues in developing countries.

#### 3.1. A summary of e-commerce in the WTO

The **Declaration on Global Electronic Commerce** (WTO, 1998) was adopted at the Second Ministerial Conference<sup>6</sup> (Geneva, May 1998), at which the WTO General Council committed, by the next session, to establishing a work programme to examine all trade-related issues around ‘electric commerce’, defined as the ‘production, distribution, marketing, sale or delivery of goods and services by electronic means’.<sup>7</sup> Three WTO bodies deal with electronic commerce: the Council for Trade in Goods, the Council for Trade in Services and the Council for Trade-Related Aspects of Intellectual Property Rights (TRIPS).

Table 2 presents a summary of the different country (or country group) proposals made to the WTO on e-commerce. These have been divided into four potential impact areas: changes to consumer privacy and protection laws, impacts on the business environment, trade and access to data.

Table 2: Summary of country proposals to the WTO on e-commerce

Proposing country/group	Privacy and consumer protection laws	Data and business environment	Trade
Argentina, Brazil and Paraguay (December 2016)		Recognise electronic signatures as valid alternatives to physical signatures.	
Brazil (December 2016)		Transparency in remuneration procedures for digital goods copyright payments.	Make national copyright laws applicable to traded digital goods when they are sourced within national borders.
China and Pakistan (November 2016)	Exchange information between members on consumer and privacy protection rights.	Exchange information between members on intellectual property rights, digital certificates, electronic signatures and electronic authentication.  Exchange information between members on regulatory measures/procedures for the establishment of cross-border e-commerce transaction platforms.  Explore measures on	Identify list of trade goods enabled by the internet and the services that support them (payment/logistics) for simplified cross-border trade.  Fast-track customs clearance.  Clarify ‘returned goods’ policy.  Extend moratorium on imposition of custom duties on electronic transmissions.  Allow establishment of

<sup>6</sup> [https://www.wto.org/english/tratop\\_e/ecom\\_e/ecom\\_e.htm](https://www.wto.org/english/tratop_e/ecom_e/ecom_e.htm)

<sup>7</sup> Classification also used in the EU/Canada et al. proposal of June 2017.

		improving infrastructure and regulation for e-commerce promotion for WTO developing members.	'bonded warehouses' in other member states.  Promote paperless trade and innovative financing solutions and facilitate data exchange (using member single-trade windows) for international e-commerce transaction platforms.
EU and Canada (June 2017)	<p>Implementation of measures a regulatory framework to ensure consumer privacy.</p> <p>Regulatory framework for consumer protection (fraud and deceptive commercial practices).</p> <p>Regulatory framework for cyber-security and removal of unsolicited communication</p>	<p>Ensure open networks and open access to the internet, allowing users their own choice of how they access the internet.</p> <p>Address licensing and authorisation procedures, for both online and offline activities.</p> <p>Address technical standards for goods and services.</p> <p>Refrain from requirements on forced transfer of or access to source code.</p> <p>Address adequate regulations and liberalisation of e-payments and mobile banking systems.</p> <p>Ensure cross-border data flows and data localisation disciplines building on existing WTO commitments (subject to appropriate public policy exceptions).</p> <p>Recognise e-signatures and electronic authorisation.</p>	<p>Proceed with WTO Telecommunication Reference Paper recommendations.</p> <p>Enforce intellectual property rights (IPR) through the World Intellectual Property Organization and WTO TRIPS Council.</p> <p>Commitment on services trade, particularly on Mode 1 and e-commerce-relevant sectors.</p> <p>Tariff elimination on goods, i.e. through the Information Technology Agreement (ITA).</p> <p>Prohibit custom duties on electronic transmissions.</p> <p>Use 'Aid For Trade' to provide technical assistance in the e-commerce development.</p> <p>Use the Trade Facilitation Agreement to enhance trade in goods generated by e-commerce, including establishment of regulatory frameworks; promote regulatory communication between members.</p>
Friends of E-Commerce for Development (FED) <sup>8</sup> (May 2017)	<p>Promote security and trust in terms of consumer and business data protection.</p> <p>Promote prevention of cybercrime.</p>	<p>Assessment of e-commerce readiness strengths and weaknesses.</p> <p>Affordable and reliable ICT infrastructure, including broadband in remote, rural and underserved areas.</p>	<p>Explore effective competition, a trade rule framework and regulations, especially for trade in goods and services necessary for e-commerce.</p> <p>Investigate trade policy barriers to trade in goods central to reducing the 'digital divide', including removal of artificial</p>

<sup>8</sup> FED was set up by a consortium of countries that acknowledge e-commerce as a tool for development: Argentina, Chile, Colombia, Costa Rica, Kenya, Mexico, Nigeria, Pakistan, Sri Lanka and Uruguay. See <http://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=1477>

		<p>Expand and ensure allocation of resources for the UNCTAD e-T.Ready programme, from LDCs to all developing countries.</p> <p>Investigate the expansion of financial services (and inclusion) to facilitate e-payment systems. Support the e-Trade for All initiative.</p> <p>Promote secure cross-border data transfers.</p>	<p>regulatory barriers.</p> <p>Promote open platforms for trade facilitation.</p>
<p><b>MIKTA (Malaysia, Indonesia, Korea, Turkey and Australia) (July 2016)</b></p>	<p>Promote consumer confidence.</p> <p>Negotiate e-commerce disciplines such as consumer protection and privacy.</p>	<p>Promote small and medium-sized enterprise access and capacity.</p> <p>Improve market access commitments to support services such as transport, logistics, delivery services and financial services.</p>	<p>Better understand trade policy approaches to e-commerce.</p> <p>Evaluate trade barriers to e-commerce using the Trade Policy Review Mechanism.</p> <p>Use the Trade Facilitation Agreement to support e-commerce.</p> <p>Improve metrics on digital trade.</p> <p>Negotiate better digital service market access commitments.</p> <p>Negotiate e-commerce disciplines such as data flows and localisation.</p>
<p><b>Singapore (February 2017)</b></p>	<p>Build trust in online transactions and e-commerce.</p> <p>Improve customer protection.</p> <p>Increase cooperation on cybercrime between countries.</p>	<p>Target technical assistance to cover the infrastructure gap in developing countries.</p>	<p>Improve business and consumer access to more payment solutions aimed at cross-border e-commerce.</p>
<p><b>US (July 2016)</b></p>	<p>Protect/foster innovations in encryption to ensure privacy and security tools meet consumer/business requirements, still allowing law enforcement access.</p>	<p>Allow open network use, open access to networks (and technological consumer choice) and ICT infrastructure competition.</p> <p>Bar enforced technology transfer, allow firms to protect their source code avoiding having to pass it on to governments and allow firms to choose their technology.</p> <p>Preserve market-driven technological</p>	<p>Ensure faster and more transparent customs procedures.</p> <p>Prohibit digital customs duties.</p> <p>Apply Most Favoured Nation (MFN) and national treatment rules to digital goods.</p> <p>Ensure stakeholder participation in development of regulations and standards.</p>

standardisation and global interoperability.

Enable cross-border data flows ensuring protection of consumer data.

Prevent localisation barriers (i.e. localised data centres).

The proposals demonstrate a number of issues that countries have raised, although three main strands of substantial impact on e-commerce stand out, which can be summarised as:

1. A call to reduce tariffs on physically traded goods and maintain zero-tariffs on electronic transactions;
2. The removal of forced data localisation requirements;
3. Strengthening consumer data protection and privacy measures.

The remaining sections of the paper discuss the potential impacts of the three proposed changes, focusing on impacts on developing countries. First, we look at the current *status quo* of the three issues, with Section 4 follows this with a description of the impact channels of the proposed changes and Section 5 looking at the potential impacts themselves.

## 3.2. Status quo of the WTO proposal impact areas

### 3.2.1. Tariff removals

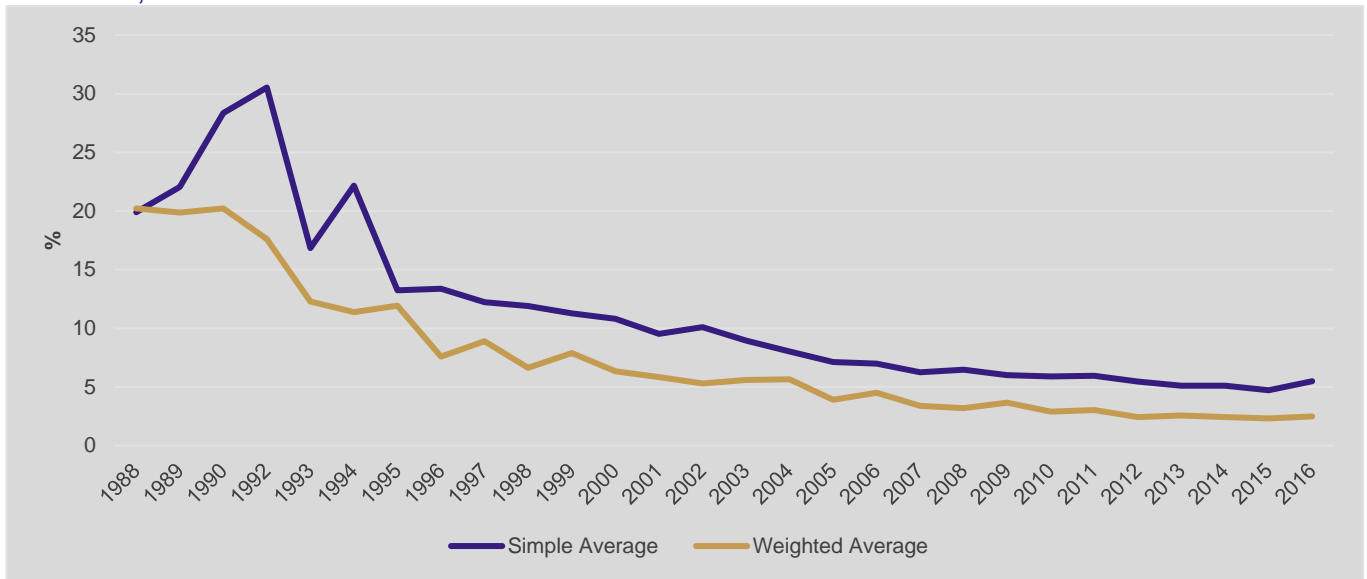
As no real data on e-commerce trade in developing countries exist, there is no database from which it is possible to calculate tariffs on e-commerce goods. Hence, to estimate the tariff *status quo* (and the impact of WTO proposals on these), this paper uses as a proxy figure the tariffs imposed on the High Technology Goods classification, which is used in the ISIC Revision 3 classification system. The logic behind its use is that, where developing countries are imposing high tariff rates on high-technology goods, these will restrict the import of goods that could be used to facilitate e-commerce – either directly through tariffs on communication systems such as computers or indirectly through the imposition of tariffs on products that could strengthen the ICT infrastructure in a developing country. One important caveat is that these may not reflect tariffs on ‘e-commerce’. However, given the lack of data, this ‘second best’ approach may begin to shed some light on the impacts of the WTO proposals, including where more information is required.

Figure 5 (below) illustrates a marked reduction in tariffs on high-technology goods between 1988 and 2016. For the simple average,<sup>9</sup> the peak average tariff was applied in 1992 at 30.53%; by 2016, this had reduced to 5.5% – an overall reduction of 25.03%. For the weighted average,<sup>10</sup> the peak was reached in 1990 at 20.22% and reduced to 2.48% by 2016 – a 17.74% reduction. This marked reduction in tariffs means that any changes to the *status quo* (i.e. further tariff reductions) would now have a much lighter impact (strictly in terms of tariffs) than in the preceding two decades.

<sup>9</sup> Where a simple tariff average across all developing countries is used.

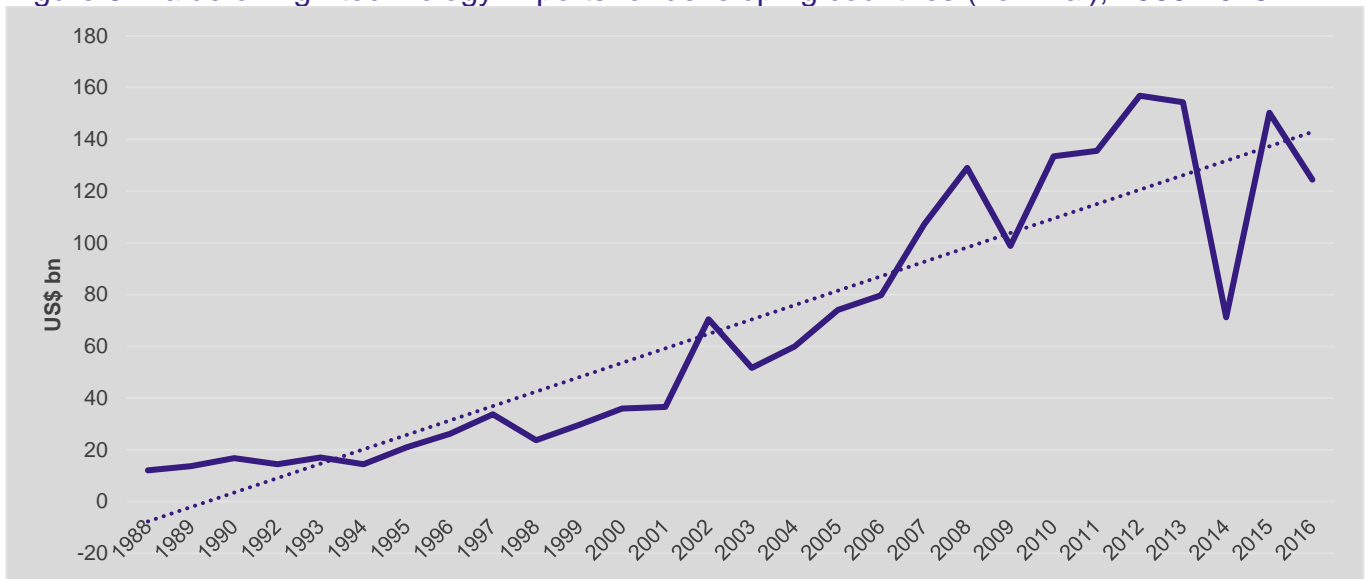
<sup>10</sup> Where tariffs were weighted based on the size of imports of different countries in the developing country group classification.

Figure 5: Simple and weighted average tariffs on high-technology imports for developing countries, 1988-2016



Source: WTO World Integrated Trade Solution (WITS) (2017).

Figure 6: Value of high-technology imports for developing countries (nominal), 1988-2016



Source: WTO WITS (2017).

This reduction in tariffs is especially significant given the ever-increasing importance of high-technology imports in developing countries. Between 1988 and 2016, the import value (in nominal terms) increased from \$12.09 billion to \$124.4 billion in 2016, a 10-fold increase in less than 30 years.

The closest agreement to a removal of tariffs on e-commerce goods is the WTO’s ITA,<sup>11</sup> which was initially signed by 29 members in 1996 and currently has 82 members and is estimated to cover around 97% of world trade in IT products. There are currently 12 developing country participants in the ITA,<sup>12</sup> representing approximately 14% of all developing countries, hence its coverage for developing country exports is not significant. However, it does include markets such as the EU, the US and China, thus it

<sup>11</sup> [https://www.wto.org/english/tratop\\_e/inftec\\_e/inftec\\_e.htm](https://www.wto.org/english/tratop_e/inftec_e/inftec_e.htm)

<sup>12</sup> Afghanistan, Egypt, El Salvador, Guatemala, Honduras, India, Indonesia, Jordan, Nicaragua, Philippines, Tajikistan and Vietnam.

may have a bigger role to play in terms of potentially facilitating future developing country IT exports to these larger markets.

### 3.2.2. Data localisation

Several of the WTO e-commerce proposals discuss the need to remove data localisation requirements – whereby countries require that data be hosted within their own legal geographic boundaries, often framed as a form of data privacy and security control mechanism. Tables 3 and 4 provide a summary of current data localisation laws. Table 3 presents a summary for selected high- and middle-income countries that have put forward WTO e-commerce proposals on data localisation, whereas Table 4 summarises laws for all available low- and lower-middle-income countries (where available).

Table 3: Summary of data localisation laws in selected high- and upper-middle-income countries

Country	Type of data	Policy
Australia	Personal	Personally Controlled Electronic Health Records Act, requiring that personal health record be stored only in Australia
Canada	Government/public	Personal data held by public bodies (in British Columbia and Nova Scotia) should be stored and accessed only in Canada
China	<ul style="list-style-type: none"> <li>• Accounting/tax/financial</li> <li>• Personal</li> <li>• Digital services</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Limited data imports through ‘Golden Shield’ controlled by the Ministry of Public Security</li> <li>• E-banking and credit reporting companies must keep servers and run operations in China</li> <li>• Health, internet mapping and insurance information must be stored locally</li> <li>• Online publishers in China must locate in China</li> <li>• Cloud computing servers must locate in China, using Chinese technology</li> <li>• Critical information infrastructure needs to be located on Chinese servers and allow Chinese government access</li> <li>• Cyber-security law requires companies to store user and business information in China</li> <li>• Draft regulation controlling transfer of information out of China by businesses</li> </ul>
EU	Varied	Laws vary by country, but EU regulation limits what countries can store data pertaining EU citizens and businesses where they provide an ‘adequate’ level of protection, as deemed by the EU
South Korea	<ul style="list-style-type: none"> <li>• Personal</li> <li>• Digital services</li> <li>• Government/public</li> </ul>	<ul style="list-style-type: none"> <li>• Companies require consent from ‘data subjects’, i.e. people or other companies, to export data</li> <li>• Korean firms cannot store customer credit card data outside of Korea</li> <li>• Regulation on Supervision of Credit Specialized Financial Business</li> <li>• Cloud computing working with Korean public agencies must be based in Korea</li> </ul>
US	<ul style="list-style-type: none"> <li>• Accounting/tax/financial</li> </ul>	Focused on public procurement and public agencies; where cloud computing and data used and stored by federal agencies and the



Country	Type of data	Policy
	<ul style="list-style-type: none"> <li>Government/public</li> </ul>	military must be located in the US

Source: Cory (2017); ITIC (2017).

Only four developing countries have effectively passed data localisation laws, and one is still at the drafting stage (see Table 4). However, a significant number of very large developed country markets (the EU, China and the US) also have data localisation laws, hence developing country firms that operate on the ICT services spectrum currently have to take these into account if they want to access these larger markets.

Table 4: Summary of data localisation laws in low- and lower-middle-income countries

Country	Type of data	Policy
India	<ul style="list-style-type: none"> <li>Accounting/tax/financial</li> <li>Government/public</li> </ul>	<ul style="list-style-type: none"> <li>Theoretic limits to the transfer of 'sensitive information' (including personal data) abroad</li> <li>Government data need to be stored locally</li> <li>Email providers need to use local servers for Indian operations</li> <li>Backups of financial information should be stored in India</li> <li>Gateway and application servers that serve the Indian market need to be in India</li> <li>Cloud data providers need to be located in India</li> </ul>
Indonesia	<ul style="list-style-type: none"> <li>Personal</li> <li>Digital services</li> </ul>	<ul style="list-style-type: none"> <li>Public service electronic systems and protected private data need to be stored within Indonesia</li> <li>E-money operators need to store data locally</li> </ul>
Kenya	Draft law	No law passed, but IT policy should promote growth of local data centres
Nigeria	<ul style="list-style-type: none"> <li>Accounting/tax/financial</li> <li>Personal</li> </ul>	<ul style="list-style-type: none"> <li>All 'subscriber, government and consumer data must be stored' in Nigeria</li> <li>All point of sale and ATM transactions need to be locally processed</li> </ul>
Vietnam	<ul style="list-style-type: none"> <li>Digital services</li> <li>Other</li> </ul>	<ul style="list-style-type: none"> <li>Access to internet only allowed through local internet service providers</li> <li>'Over-the-top' services (i.e. VoIP or Instant Messaging) must be localised;</li> <li>Companies that provide online services should have at least one server in Vietnam</li> <li>Law against spam email mandating that advertising companies can only send texts and emails from within Vietnam</li> </ul>

Source: Cory (2017); ITIC (2017).

### 3.2.3. Consumer data privacy and protection

A significant number of developing countries have already implemented a range of laws that cover consumer protection, privacy, cybercrime and electronic transaction laws. Table 5 shows, using a

sample of 84 developing countries, the proportion that have already implemented some form of these laws, that are in the drafting process and that have not implemented or drafted laws.

In terms of e-commerce, nearly two thirds of developing countries have electronic transaction laws, whereas just over half have laws dealing with cybercrime. Approximately a third have laws for consumer protection and data privacy; conversely, 57.1% have no laws in place that would provide consumer protection on e-commerce activities and 50% do not have data privacy laws.

Table 5: Developing countries implementing consumer protection laws (% of 84 countries)

	Implemented	Draft	No laws
<b>Electronic transaction laws</b>	61.7	19.3	19.0
<b>Consumer protection laws</b>	33.3	9.5	57.1
<b>Data privacy laws</b>	38.1	11.9	50.0
<b>Cybercrime laws</b>	56.0	11.9	32.1

Source: UNCTAD (2017b).

As a side issue, several developing countries have also been signatories to the WTO TRIPS Agreement,<sup>13</sup> which is an international agreement on the protection of intellectual property rights. The TRIPS agreement is firmly grounded in the IPR issue which helps promote inward investment, research and development (R&D) and foreign direct investment (FDI). Even though it does not cover consumer data privacy and protection concerns, existing adherence to the TRIPS could (speculatively) signal facilitated implementation of consumer data privacy and protection laws by adhering developing countries as the institutional capabilities used to implement the TRIPS are closely related to data privacy & protection implementation capabilities.

## 4. PATHWAYS TO ECONOMIC TRANSFORMATION

Developing country participation in e-commerce can help increase economic transformation by helping firms (and citizens) access new technologies and new markets, reduce transaction costs and increase efficiency gains through greater information and communication networks, such as the proliferation of new, or better, technologies. All these changes help increase the productivity of firms, in turn helping them increase their export potential and potentially upgrade their position in global value chains, and then move productive resources to greater-productivity activities, or sectors, driving growth, incomes and poverty reduction in developing countries.

### 4.1. Tariff reductions

The e-commerce proposals include several calls to reduce or eliminate tariffs on goods facilitated by digital means – that is, through the purchase of physical goods in another country through digital means – and on purely digital goods – that is, non-physical digital products (music files, electronic books etc.) – in another country purchased through digital means. The proposals vary from an extension on the current WTO member moratorium on imposing customs duty on electronic transmissions (WTO, 2013b), as proposed by China and others, to the complete removal of tariffs through wider application of the ITA as proposed by the EU, to the application of MFN status for all digital goods, put forward in the US proposal.

<sup>13</sup> [https://www.wto.org/english/tratop\\_e/trips\\_e/trips\\_e.htm](https://www.wto.org/english/tratop_e/trips_e/trips_e.htm)

Whilst it is unknown what would happen to electronic transaction flows if the current moratorium is not extended, further reductions of tariffs on imports of electronically traded goods could potentially have a significant impact on international ICT trade. The use of ICTs in trade can help foster competition (by widening consumer reach and increasing the number of players within a given commercial field), but, vice versa, increased trade liberalisation can also help with the proliferation of ICT, thereby improving the competitiveness of those that adopt new technologies (Kiryama, 2011). In direct relation to the issue of tariffs, Miller and Atkinson (2014) explain that the price of ICTs matters, as tariffs can reduce demand, in turn potentially reducing their productivity-enhancing benefits. This highlights the fact that there is a high price elasticity on ICT products; for example, taxes on ICTs in Bangladesh (which is estimated to have the highest internal and external taxation level on ICTs) are estimated to reduce demand for ICT products by 52%.

## 4.2. Forced data localisation

Widespread use of the internet has significantly facilitated the transfer of data, with immediate transactions now possible between businesses and customers. This has led to increasing levels of e-commerce between sellers and buyers located in different countries. As these transactions increase in volume and complexity, so too the amount of information that flows between these countries, referred to here as cross-border data flows, will increase. However, assessing the volume and direction of cross-border data flows is highly problematic, as international data sources count the exchange of data only when it is treated as a service – that is, where there is a monetary value attached. Where no money is exchanged, data flows are not measured (Mandel, 2014).

A 2014 McKinsey report finds a positive correlation between estimated global data flows and global GDP growth, where global data flows contribute between 15% and 25% of total global GDP growth per year, and that more connected economies reap up to 40% more benefits than less connected economies. Conversely, disruptions to cross-border data flows could have negative economic impacts. For example, estimates of the impact of EU implementation of its General Data Privacy Regulation calculate a potential decrease of between -0.8% and -1.3% of GDP across the EU (Bauer et al., 2013).

If data localisation laws were to be relaxed across implementing countries, the impact on developing country firms (outside the four countries that implement such laws) might be felt more in the medium to long term as the ICT sectors of these developing countries gradually grow in importance and are able to export their products to other developing countries.

## 4.3. Consumer data privacy and protection

Most of the e-commerce proposals point to the importance of consumer privacy and protection, especially in relation to increasing consumer confidence and reducing risks involved in participating in e-commerce.

Although access to finance is currently a stronger impediment to being able to participate in e-commerce activities in developing countries (e.g. the average of over 15s across all developing countries who have access to credit card is 12.7%) (UNData, 2017), better consumer protection and data privacy measures should increase consumer confidence in e-commerce. Increased confidence in the capacity for e-commerce participants to protect consumer data and ensure their privacy should (in theory) lead to greater uptake and promotion of e-commerce activities, including greater levels of cross-border trade. This will bolster those sectors involved in e-commerce for both producers of physical goods facilitated by digital means and providers of digital goods or services.

It is also important to understand that consumer data are themselves a tradable commodity, with inherent monetary value (Acquisti et al., 2015). Firms value large datasets that can provide more information on customer characteristics and preferences, which helps 1) tailor products for specific markets and 2) increase information on these, reducing informational asymmetries and allowing a

degree of de-risking. Both can lead to greater levels of investment where such market data are available. Increased restrictions on these data flows, or on the capacity for firms to collect such data, may have impacts on individual firms, which may have negative effects when aggregated at the economy-wide level – that is, reducing inward investment, export and import flows and overall growth rates. This does not mean, however, that consumer data should be made freely available, as privacy (i.e. data anonymity) and citizen protection (e.g. discrimination) concerns need to be addressed to prevent unfair usage of data by both companies and governments. In addition, data security requirements need to be strong enough to hinder criminal access to data, which in turn would help raise consumer confidence.

## 5. IMPACT ASSESSMENT

This section attempts to cross-reference the main proposals identified in Section 2, the *status quo* data used in Section 3 and the identified impact channels identified in Section 4 to analyse their potential impacts on developing countries. It first looks at which developing countries are most likely to be affected by changes to the e-commerce *status quo* by ranking developing countries on a selected number of ICT-relevant indicators. It then provides more details on the specific impacts of the three main WTO proposals. The first subsection assesses what changes may occur as a result of the removal or reduction of tariffs on e-commerce goods and service, the second looks at changes proposed to the governance of cross-border data flows through the data localisation lens and the third discusses impacts on consumer privacy and protection.

For developing countries, the growth impacts of ICT may be greater than in developed countries. Estimates suggest a marginally greater impact of ICT on GDP growth when compared with developed countries (Qiang, 2009; World Bank, 2009; Niebel, 2014; Samimi et al., 2015). E-commerce, in particular, allows small and medium-sized enterprises in developing countries to increase their participation in global value chains, as well as more effective access to global markets. This may help increase financial inclusion (through the proliferation of new payment platforms) and increase developing country shares of global trade (OECD and WTO, 2017).

Tables 6 and 7 present the top 10 low- and lower-middle income countries in terms of participation in ICT services exports. For low-income countries, Nepal, Uganda and Senegal exhibit the highest value of ICT services exports; as a proportion of total services exports, Sierra Leone, Nepal once again and Mali are the top three. For lower-middle-income countries, the Philippines and India take the top two spots in terms of both value and share of total services exports.

Table 6: Top 10 low-income countries for ICT services, 2014

ICT services as % of total services exports		ICT services in terms of value (US\$ mn)	
Country	%	Country	Value
Sierra Leone	60.1	Nepal	578.3
Nepal	41.6	Uganda	565.7
Mali	39.6	Senegal	484.5
Senegal	36.7	Tanzania	399.8
Malawi	28.4	Afghanistan	303.5
Burundi	27.2	Mali	180.9
Afghanistan	24.4	Sierra Leone	122.9
South Sudan	20.3	Benin	90.1
Zimbabwe	19.5	Mozambique	85.6
Uganda	18.4	Togo	78.2

Source: World Bank WDI (2017).

Table 7: Top 10 lower-middle-income countries for ICT services, 2014

ICT services % of total services exports		ICT services in terms of value (US\$ mn)	
Country	%	Country	Value
Philippines	70.4	India	102.9
India	65.5	Philippines	17.9
Mauritania	64.9	Indonesia	7.2
Papua New Guinea	63.5	Morocco	2.8
Swaziland	54.5	Egypt	2.3
West Bank & Gaza	28.2	Pakistan	1.6
Pakistan	28.1	Bangladesh	0.85
Bangladesh	27.4	Sri Lanka	0.79
Lesotho	27.4	Myanmar	0.71
Indonesia	26.5	Kenya	0.65

Source: World Bank WDI (2017).

Table 8 highlights two other relevant statistics. The first is the percentage of over 15s who own a debit card, with Mongolia, Ukraine and Nigeria representing the top three. Average debit card ownership is

12.7% of all over 15 year olds, across 68 developing countries, which indicates a high level of divergence in access: the lowest users, including Ethiopia and Niger, are below the 1% level. As international e-commerce trade<sup>14</sup> hinges on access to formal finance, especially in terms of credit and debit cards for use in online transactions, limited usage of these in developing countries means there will be limited e-commerce participation. Access to online purchasing platforms (e.g. Amazon) requires the use of credit cards, hence even with the proliferation of mobile money platforms (such as the popular Kenyan MPESA mobile transaction platform), the capacity to do so is 'officially' unavailable unless use is made of third party software, which adds additional transaction costs and further lowers purchaser security.<sup>15</sup>

The right-side columns of Table 8 show the top five and bottom five countries in terms of percentage of firms in developing countries that interact with clients and suppliers by email. The statistic is a simple proxy of firm interaction through ICT for B2B and B2C activities. With an average of 60.2% across 68 developing countries, interactions between businesses and their customers and suppliers are high, peaking at 97% of all firms in Morocco, and at the lowest in Sierra Leone, with 15.5% of firms.

Table 8: Top five and bottom five developing countries for (left) debit card ownership and (right) firms interacting by email with clients and suppliers

Debit card ownership (% of over 15 year olds)		Firms using email to interact with clients or suppliers (%)	
Top 5 countries	%	Top 5 countries	%
Mongolia	65.71	Morocco	97
Ukraine	39.70	Papua New Guinea	96.9
Nigeria	35.60	Tunisia	93.6
Kenya	34.65	Bolivia	93.2
Kosovo	33.87	Vietnam	91.5
Bottom 5 countries	%	Bottom 5 countries	%
Afghanistan	1.65	Nigeria	23.5
Madagascar	1.57	Côte d'Ivoire	22.1
Burundi	1.31	Yemen, Rep.	21.8
Ethiopia	0.75	Guinea	20
Niger	0.49	Sierra Leone	15.5

Source: WTO WITS (2017)

One obvious missing metric is employment in ICT. This metric is available for only 25 countries, none of which falls into the lower-middle- or low-income country classification.<sup>16</sup> As such, information on the

<sup>14</sup> Domestic e-commerce trade of physical goods may not be as dependent on access to formal finance as digital platforms could be used to simply browse goods whilst purchases are made in cash in physical stores.

<sup>15</sup> E.g. for MPESA customers: <https://urbankenyans.com/shop-amazon-kenya-mpesa-airtel/>

<sup>16</sup> [https://tcdata360.worldbank.org/indicators/ict.emp?indicator=27&viz=bar\\_chart](https://tcdata360.worldbank.org/indicators/ict.emp?indicator=27&viz=bar_chart)

importance of the ICT sector for employment, although a significant component of services exports in many lower-middle-income (and some low-income) countries, is missing.

## 5.1. Tariff removals and reductions

Miller and Atkinson (2014) also estimate price elasticities by region, dividing the results into three bands: high estimates, mid estimates and low estimates (see Table 9), all of which are invariably negative and relatively high, even those within the mid-range estimate group. This essentially means that, when tariffs are imposed on ICT goods and services, their usage can be severely reduced. This is not only applicable to the import of goods but also in terms of extra costs to operation (such as data localisation requirements, illustrated in the section below).

Table 9: Price elasticities on ICT demand

Region	High	Mid	Low
MENA	-2.3	-0.7	-0.2
Sub-Saharan Africa	-3.0	-0.9	-0.2
East Asia	-1.9	-1.1	-0.9
South Asia	-2.9	-1.4	-0.9
Europe and Central Asia	-0.8	-0.4	-0.3
Latin America and the Caribbean	-2.2	-1.3	-1.0
North America	-0.5	-0.2	-0.1

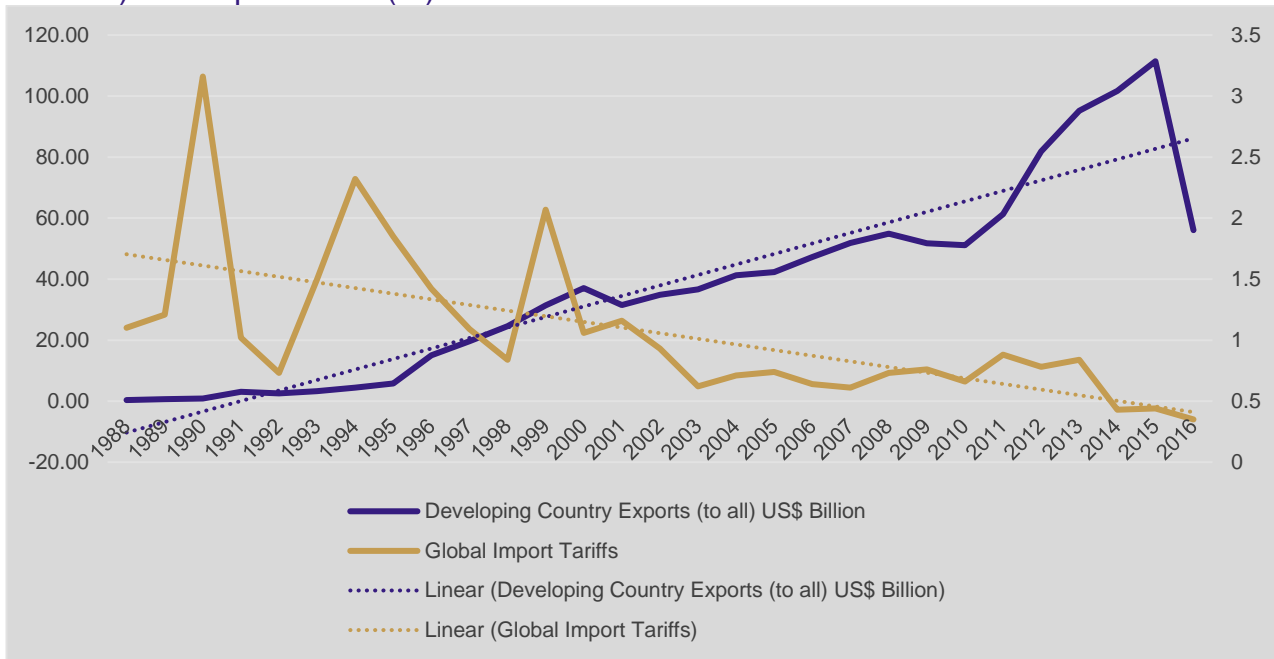
Source: Miller and Atkinson (2014).

Hence, tariff levels affect the economic transformation potential of developing countries if they reduce the use of productivity-enhancing ICT goods and services. In addition, they could have negative implications for the current digital divide catch-up process for developing countries if import tariffs make it harder for firms and individuals to access ICT goods and services.

Therefore, to assess the implications of these proposals, we assess the position on the assumption of tariff removals, rather than any reduction in tariffs, given that, in the absence of a precise tariff reduction number (or tariff limit), this would be the maximum limit of the proposals. To do so, we begin by estimating the impact on production structures attributable to changes in tariffs – that is, does the removal of tariffs on e-commerce goods help a country increase its participation in international trade?

Pearson correlations between tariffs and the volume of high-technology imports are strong and negative for both the weighted tariff average (-0.75) and the simple average (-0.76). Although we cannot infer that a decrease in the tariff rates on high-technology goods imports would lead directly to an increase in the volume of high-technology goods imports, regressing (see Annex 3 for more details) the weighted tariff average with the volume of imports (and controlling for developing country GDP), for the period between 1988 and 2016, shows a significant negative relationship, where a 1 percentage point decrease in tariffs could lead to a (nominal) increase of approximately \$2.2 billion in high-technology imports by developing countries.

Figure 7: High-tech goods exports from developing countries to all countries (US\$ billion, nominal) and import tariffs (%)

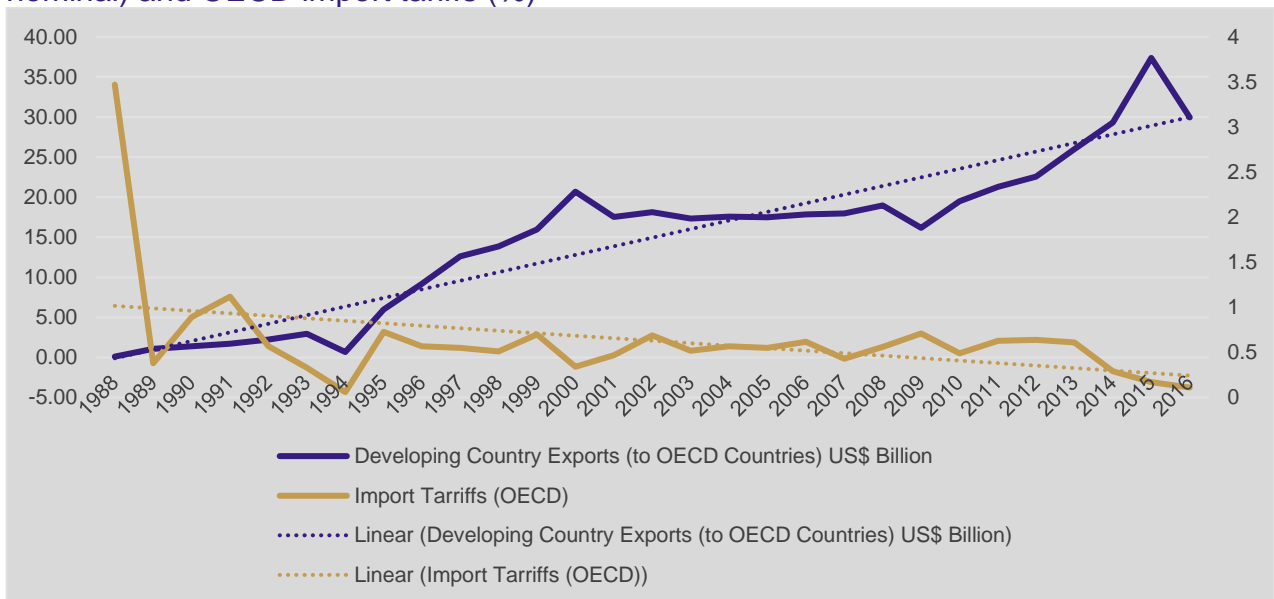


Source: Own calculations based on WTO WITS (2017).

As Figure 7 illustrates, developing country exports of high-technology goods have been on a steady upward trend since the late 1980s (also noted by, e.g., Kiriya, 2011). Conversely, the global average (weighted) tariff rate has been declining. A simple regression between these two datasets (also between 1988 and 2016), controlling for global GDP, shows a negative relationship, where an average decrease in global tariffs by 1 percentage point increases developing country exports by \$3.4 billion.

Similarly, when looking at developing country exports to OECD countries, the relationship between these and tariffs levied on high-technology goods by OECD countries (also for the period 1988-2016 and controlling for OECD GDP) is similarly negative, where a 1 percentage point decrease in OECD tariffs results in a \$1.7 billion increase in developing country exports of high-tech goods to OECD partners.

Figure 8: High-tech goods exports from developing countries to OECD countries (US\$ billion, nominal) and OECD import tariffs (%)



Source: Own calculations based on WTO WITS (2017).



The results suggest one important fact: tariffs in developing countries can influence the degree to which they import high-technology goods. Although the historical trend has seen a decrease in the tariff rate, productivity gains from the use of high-tech goods could be increased in developing countries through further reductions in their tariff levels, ensuring these countries do not lag further in the digital divide.

## 5.2. Data localisation

Although developed countries tend to have the highest level of connectivity,<sup>17</sup> some developing countries are catching up (see Table 10 for data for represented developing countries in the McKinsey Connected Index). For example, India increased its position by 16 ranks between 2012 and 2014 and is overall 30th in the Connectedness Index, with a roughly estimated data flow worth just over \$1 trillion and a 'flow intensity'<sup>18</sup> of 61%, whereas Nigeria and Tunisia exhibit flow intensities of 102% and 116%, respectively, indicating a strong role in cross-border data flows for these economies.

Table 10: McKinsey Global Connectedness Index, selected indicators for represented developing countries, 2014

Country	Rank (change from 2012)	Estimated flow value (US\$ bn)	Flow intensity (change from 2012)
India	30 (+16)	1,131	61% (+37%)
Morocco	53 (+26)	91	95% (+46%)
Indonesia	56 (-3)	494	56% (+2%)
Nigeria	63 (N/A)	267	102% (N/A)
Egypt	63 (-12)	139	53% (+2%)
Tunisia	78 (-19)	53	116% (+11%)
Pakistan	85 (-30)	78	35% (-8%)

Source: McKinsey (2014).

Multiple proposals to the WTO call for unimpeded and unrestricted flows of cross-border data. The arguments in favour of this consider the capacity for these data flows to open access to new markets, improve R&D capabilities, reduce transactional costs, increase logistics and manufacturing process efficiency and increasingly facilitate the proliferation of value chain networks across the globe (Meltzer, 2013).

Cross-border data flows are, however, subject to state-imposed data localisation requirements. Table 11 discusses, qualitatively, the potential impacts that the removal of data localisation requirements would have on the capacity for developing country firms to access national markets and sectors in the countries where these are currently in play. Increased access to developed country markets would largely help service provision firms, which can decide whether to locate in-country based on business requirements rather than legislation requirements.

<sup>17</sup> As represented by the Global Connectivity Index (McKinsey, 2014), an aggregate of 40 indicators that measures the volume of 'data flows' between countries (as a proportion of estimated global data flows) and the capacity to engage in cross-border data-sharing through the availability of human skills, ICT infrastructure and ICT services (supply and demand) in a country.

<sup>18</sup> Representing the total value of goods, services and financial flows as a percentage of GDP.

Table 11: Summary of data localisation laws in selected high- and upper-middle-income countries

Country	Possible developing country impacts
<b>Australia</b>	Would allow health care providers in developing countries to store records on own servers.
<b>Canada</b>	Would allow health care providers in developing countries to store records on own servers. Impact restricted to companies that would operate in British Columbia and Nova Scotia as only these two states have data localisation laws.
<b>China</b>	Would allow service providers and platform providing firms across multiple sectors in developing countries the capacity to operate in China without having to invest in local data servers if these were not needed from an efficiency point of view.
<b>EU</b>	Expansion of service providers not limited to the EU 'adequate' classification would help less secure firms access EU markets, with potential negative impacts on EU data security.
<b>South Korea</b>	ICT service providers would be able to store data within their preferred storage location and could access cloud computing services outside of South Korea.
<b>US</b>	Would allow qualifying public service providers from developing countries to store records on own servers.
<b>India</b>	Similarly to China, this would allow developing country service providers and platform providing firms the capacity to operate, gather and export and host data platforms outside of India.
<b>Indonesia</b>	Impacts would be limited to electronic payment systems that could use remote locations for data storage rather than setting up physical servers in Indonesia.
<b>Kenya (draft)</b>	Could inhibit growth of Kenya based data centre; however, only theoretical at the moment.
<b>Nigeria</b>	Impact only on payment processing activities would limit impact to non-domestic banks or payment systems.
<b>Vietnam</b>	The largest impact would be on firms that operate large online platforms (such as social media, video games, etc.).

The impacts highlighted above essentially boil down to two main ones. The first is the removal of capital investment barriers – that is, developing country firms could access new markets as it becomes less expensive for them to do so. The second is the removal of knowledge barriers: as data flows are liberalised, firms gain greater freedom in terms of their capacity to manage and transmit data between countries, improving their knowledge of new markets (reducing informational asymmetries). This could help increase inward investment within newly opened markets. It is important to note, however, that, given the size of their internal markets, firms may not be deterred from investing in India, Indonesia, Nigeria and Vietnam. The removal of data localisation laws as these may not currently deter FDI in the country as the current costs may be low enough (in relative terms) to be superseded by any operational gains achieved by adhering to data localisation laws.

This does not mean data localisation laws do not negatively affect the economies of countries that impose them. There are some estimated economic costs to data localisation, as illustrated by Bauer et al. (2014, 2015) in eight countries. These estimates find there is a significant negative GDP impact in all jurisdictions, ranging from -0.2% in Brazil to -1.7% in Vietnam (see Table 12), as well as negative impacts on domestic investment levels: -2.3% in Indonesia, -1.4% in India and -3.1% in Vietnam for the developing countries included in the analysis. Given the economic implications of data localisation, the

results of removing forced data localisation requirements, from an economic transformation point of view, are positive.

Table 12: Summary of estimated growth and investment effects of data localisation

Country	Effect
Brazil	-0.2% GDP; -4.2% domestic investment
China	-1.1% GDP; -1.8% domestic investment; -1.7% exports
EU	-0.4% GDP; -3.9% domestic investment
India	-0.1% GDP; -1.4% domestic investment
Indonesia	-0.5% GDP; -2.3% domestic investment; -1.7% exports
Korea	-0.4% GDP; -0.5% domestic investment
Vietnam	-1.7% GDP; -3.1% domestic investment
Russia	-0.3% GDP; -1.4% domestic investment

Source: Bauer et al. (2014, 2015).

Changes in data localisation laws should consider consumer protection issues. Several data localisation requirements are put in place to protect consumer information; relaxation of these would allow increased monetisation of personal data without the consumer being aware of or benefiting (directly). Relaxation may thus be counter-productive in terms of the increased consumer privacy and protection objectives also outlined in the WTO proposals. The proposals should also address the issue of taxation, whereby data localisation may be one solution to ensure enterprises with real interests, but only virtual presence, in each country can be made to pay taxes that reflect the revenues of the economic activities they undertake within said countries. Removing data localisation practices may make it easier for firms to avoid paying local taxes, though this issue requires further investigation.

### 5.3. Consumer data privacy and protection

There is no simple measure of the impact of increased consumer data privacy protection on developing countries. Section 4 of this paper identified impact channels of increased consumer data protection and privacy, and we have shown the proportion of developing countries that do not have such laws in place. Given the country-specific and qualitative nature of such laws (as there is no standard regulation), at present we have no effective way to effectively measure impacts on developing countries.

At the abstract level, we can posit that an improvement in data protection in developing countries that allows them to meet international standards (i.e. those set forward by the EU's 'adequate' classification highlighted above) could allow developing country firms to penetrate markets by adhering to their stated standards, helping increase exports to such destinations (Curtiss, 2016). Strengthened e-payment and consumer data protection systems would facilitate direct purchasing of products from developing country retailers.

Given the paucity of data, a proxy approach involves taking a cursory look at the impacts of IPR enforcement on developing countries. IPR and consumer data privacy and protection are not directly relatable. The logic behind this approach is that strengthened laws governing product demand – that is, data protection laws – may to some (currently unquantifiable) extent mirror the impact of laws that govern product supply – that is, IPR laws. Sattar and Mahmood (2011) look at the impacts of strengthened IPR laws in a panel of 38 countries, including 11 low-income countries, and find that IPR

laws positively affect the GDP growth rate for all countries; however, the effect is smaller for low-income countries. On the other hand, Adams (2009) uses a panel of 73 developing countries and finds a negative relationship between IPR and economic growth, attributing greater importance to domestic institutions and domestic investment levels. Ivus (2010) finds that strengthened IPR laws lead to increased exports from developed to developing countries. Maskus (2000) finds positive technology transfer impacts of strengthened IPR in developing countries.

These results suggest that strengthened data protection laws may not have a clear growth impact in developing countries. However, it is important to note that these results are not directly comparable or transferable, hence more information is required to effectively prove the growth benefits of stronger data laws in developing countries.

## 6. CONCLUSIONS

The paper has highlighted the state of e-commerce in developing countries through multiple proxy measures. These illustrate that there is significant growth in ICT-related activities in developing countries, specifically centred on the provision of ICT services by lower-middle-income countries, with India and Indonesia at the forefront; smaller low-income countries like Nepal also show significant participation in the ICT market.

One important aspect to note is that, while these activities are increasing and can represent a significant percentage of total service exports, their value is still low relative to ICT activities in high-income countries. This means there is scope to increase value addition in these activities in developing countries – hence the focus on e-commerce at the WTO could, theoretically, provide a significant boost to economic transformation by helping developing countries move to more valuable ICT services (and related activities), at the same time promoting the positive externalities on growth that these enhanced services could both promote and create.

Even though the proposals theoretically have a potentially positive transformative impact, it is important to note that we cannot assess actual impacts because of a lack of data on e-commerce. One of the main implications of this paper is that it is imperative that all countries agree on, and use, a standard (or multiple standards) to measure trade in e-commerce, should they decide such knowledge is worth the cost.

Data scarcity means economic transformation effects can only be theorised, using proxy data metrics to give an indication of potential impacts. This leads to the second takeaway point – that the proposals to the WTO are currently unquantified, hence there is no substantive change defined (i.e. for tariffs) that can be categorically applied. Once the proposals have been negotiated and accepted, these could then be measured, but only if clear metrics on e-commerce are first defined and collected. This should also include the measure of electronic transactions which could help assess what the impact of the current moratorium on the imposition of tariffs on electronic transmissions has been and what (if any) changes made to it would entail.

Therefore, we cannot present authoritative results here. Given this significant caveat, our preliminary results show that some of the changes proposed in the e-commerce proposals would have beneficial economic transformation effects. For example:

- The proposed removal of tariffs on ICT-related goods and services could significantly boost import levels in developing countries, helping increase adoption rates, with associated increases in productivity.
- In addition, the removal of tariffs could be associated with an increase in the export of ICT-related goods by developing countries, although the evidence is not conclusive. Increased export levels from developing countries could increase the rate of movement toward the production of higher-value ICT-related goods and services in developing countries.

- Initial studies on data localisation issues have shown that these negatively affect growth and may affect developing country firms' capacity to set up e-commerce (such as digital goods and services provision) operations in implementing markets.
- While a majority of developing countries already have electronic transaction laws in place, they lag behind in terms of consumer privacy and data protection measures. Current policy and technical capabilities may constrain implementation; however, it would be worth doing so as these would promote greater consumer confidence in markets but may also stimulate further use of data localisation measures.

## REFERENCES

- Adams, S. (2009) 'Intellectual property rights, political risk and economic growth in developing countries', *Journal of Economics and International Finance* 1(6), November.
- Acquisti, A., Taylor, C. and Wagman, L. (2015) 'The economics of privacy', *Journal of Economic Literature* 54(2): 442-492.
- Arora, A. and Gambardella, A (2005) 'The globalization of the software industry: perspectives and opportunities for developed and developing countries', *Innovation Policy and the Economy* 5. Cambridge, MA: MIT Press.
- Bauer, M., Erixon, F., Krol, M., Lee-Makiyama, H. and Verschable, B. (2013) 'The economic importance of getting data protection right: protecting privacy, transmitting data, moving commerce'. Report, March. Brussels: ECIPE.
- Bauer, M., Lee-Makiyama, H., van der Marel, E. and Verschelde, B. (2014) 'The costs of data localisation: friendly fire on economic recovery'. Occasional Paper 3/2014. Brussels: ECIPE.
- Bauer, M., Lee-Makiyama, H., van der Marel, E. and Verschelde, B. (2015) 'Data localisation in Russia: a self-imposed sanction'. Policy Brief 6/2015. Brussels: ECIPE.
- Bourassa, F. (2011) 'Measuring trends in ICT trade: from HS2002 to HS2007 / ICT product definition'. UNCTAD ESA/STAT.AS. 234/23, May.
- Cory, N. (2017) 'Cross-border data flows: where are the barriers, and what do they cost?' Washington, DC: ITIF. (<https://itif.org/publications/2017/05/01/cross-border-data-flows-where-are-barriers-and-what-do-they-cost>)
- Curtiss, T. (2016) 'Privacy harmonization and the developing world: the impact of the EU's General data Protection Regulation on Developing Economies', *Washington Journal of Law, Technology & Arts* 12(1), Fall.
- EC (European Commission) (2014) 'Thinking in a box: a 'Mode 5' approach to service trade'. EC Chief Economist Note (TRADE) 1, March.
- Ecommerce Foundation (2016) *Global B2C e-commerce report 2016*. Amsterdam: Ecommerce Foundation.
- FED (Friends for E-Commerce for Development) (2017) 'Friends for E-Commerce for Development: mapping e-trade for all development objectives into a WTO Framework for e-commerce'.
- ITIC (Information Technology Industry Council) (2017) 'Data localisation snapshot', 19 January. Accessed September 2017. (<https://www.itic.org/public-policy/SnapshotofDataLocalizationMeasures1-19-2017.pdf>)
- ITU (International Telecommunication Union) (2017) 'ITU database'. Accessed September 2017. (<http://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx>)
- Ivus, O. (2010) 'Do stronger patent rights raise high-tech exports to the developing world?' *Journal of International Economics* 81(1): 38-47.
- Kiryama, N. (2011) 'Trade in information and communications technology and its contribution to trade and innovation'. Trade Policy Working Paper 115. Paris: OECD.
- Makoni, E., Tsikirayi, C.M. and Mandizha, E. (2013) 'To charge or not to charge customs excise duty on digitized products: an assessment of the Zimbabwe Revenue Authority (ZIMRA) potential revenue losses through duty exemption on digitized goods', *International Journal of Education and Research* 1(8), August.
- Mandel, M. (2014) 'Data, trade & growth'. Policy Memo, April. Washington, DC: Progressive Policy Institute.
- Maskus, K.E. (2000) 'Intellectual property rights and economic development', *Case Western Reserve Journal of International Law* 32(1): 471-506.

- Meltzer, J. (2013) 'The internet, cross-border data flows and international trade', *Issues in Technology Innovation* 22, February.
- McKinsey (McKinsey Global Institute) (2014) 'Global flows in a digital age: how trade, finance, people and data connect the world economy'.
- Miller, B. and Atkinson, R.D (2014) 'Digital drag: ranking 125 nations by taxes and tariffs on ict goods and services'. Washington, DC: ITIF. (<http://www2.itif.org/2014-ict-taxes-tariffs.pdf>)
- Niebel, T. (2014) 'CT and economic growth – comparing developing, emerging and developed countries'. IARIW 33rd General Conference Paper, Rotterdam, August.
- OECD (Organisation for Economic Co-operation and Development) (2015) *OECD digital economy outlook 2015*. Paris: OECD.
- OECD (Organisation for Economic Co-operation and Development) and WTO (World Trade Organization) (2017) *Aid for trade at a glance 2017: promoting trade, inclusiveness and connectivity for sustainable development*. Paris: OECD and WTO.
- Payvision (2016) 'Key business drivers and opportunities in cross-border ecommerce'. Key Business Drivers 2016. (<https://www.payvision.com/cross-border-ecommerce-report-survey-2016>)
- Qiang, C.Z.W. and Rossotto, C. (2009) 'Economic impacts of broadband', in World Bank (ed.) *Information and communications for development 2009*. Washington, DC: World Bank.
- Samimi, A., Ledary, R. and Samimi, M. (2015) 'ICT & economic growth: a comparison between developed & developing countries', *International Journal of Life Science and Engineering* 1(1): 26-32.
- Sattar, A. and Mahmood, T. (2011) 'Intellectual property rights and economic growth: evidence from high, middle and low income countries', *Pakistan Economic and Social Review* 49(2), Winter.
- UNCTAD (UN Conference on Trade and Development) (2015) *Information economy report 2015*. Geneva: UNCTAD.
- UNCTAD (2017a) 'UNCTADStats'. Accessed September 2017. (<http://unctad.org/en/Pages/statistics.aspx>)
- UNCTAD (2017b) 'UNCTAD B2C E-Commerce Index 2016'. Technical Note on ICT for Development 7. Geneva: UNCTAD.
- UN (2017) 'UNData'. Accessed September 2017. (<http://data.un.org/>).
- World Bank (2009) *Information and communications for development 2009*. Washington, DC: World Bank.
- World Bank (2016) *World development report 2016: digital dividends*. Washington, DC: World Bank.
- World Bank (2017a) 'Enterprise Survey database'. Accessed September 2017. (<http://www.enterprisesurveys.org/data>)
- World Bank (2017b) 'World Development Indicators'. Accessed September 2017. (<https://data.worldbank.org/data-catalog/world-development-indicators>)
- WTO (1998) 'Declaration on Global Electronic Commerce'. WT/MIN(98)/DEC/2, 2 May.
- WTO (2013) *E-commerce in developing countries*. Geneva: WTO.
- WTO (2013b) 'Work Programme on Electronic Commerce'. Ministerial Decision of 7 December 2013 WT/MIN(13)/32 & WT/L/907, 11 December.
- WTO (2016a) 'MIKTA e-commerce workshop reflections'. JOB/GC/99, 22 July.
- WTO (2016b) 'Work Programme on Electronic Commerce'. JOB/GC/94, 4 July.
- WTO (2016c) 'Work Programme on Electronic Commerce'. JOB/GC/110/Rev.1, JOB/CTG/2/Rev.1, JOB/SERV/243/Rev.1, JOB/DEV/39/Rev.1, 16 November.
- WTO (2016d) 'Work Programme on Electronic Commerce'. JOB/GC/113, JOB/IP/19, 15 December.

WTO (2017a) 'WTO World Integrated Trade Solution'. Accessed September 2017.  
(<https://wits.worldbank.org/>)

WTO (2017) 'Work Programme on Electronic Commerce'. JOB/GC/116/Rev.2, JOB/CTG/4/Rev.2, JOB/SERV/248/Rev.2, JOB/IP/21/Rev.2, JOB/DEV/42/Rev.2, 15 June.



## ANNEX 1: SERVICES TRADE MODE CLASSIFICATIONS

Given the significance of services trade to the discussion on e-commerce, a brief description of how services are classified by the WTO may be beneficial. The **WTO currently** defines **four modes** of services trade – (GATS Article I:2):

**Mode 1:** Services supplied 'from the territory of one Member into the territory of any other member' *Cross-Border Trade*

**Mode 2:** Services supplied 'in the territory of one member to the service consumer of any other member' *Consumption Abroad*

**Mode 3:** Services supplied 'by a service supplier of one member, through commercial presence, in the territory of any other member' *Commercial Presence*

**Mode 4:** Services supplied 'by a service supplier of one member, through the presence of natural persons of a member in the territory of any other member' *Presence of Natural Persons*

The EC (2014) makes the case for a **Mode 5** indirect services supply mode. These would be 'service exports that are domestic intermediate services inputs that are incorporated in one country's merchandise exports' – these are 'embodied i.e. an inseparable part of the production process of a manufacturing good'. The definition would include design, R&D and architectural and engineering services.

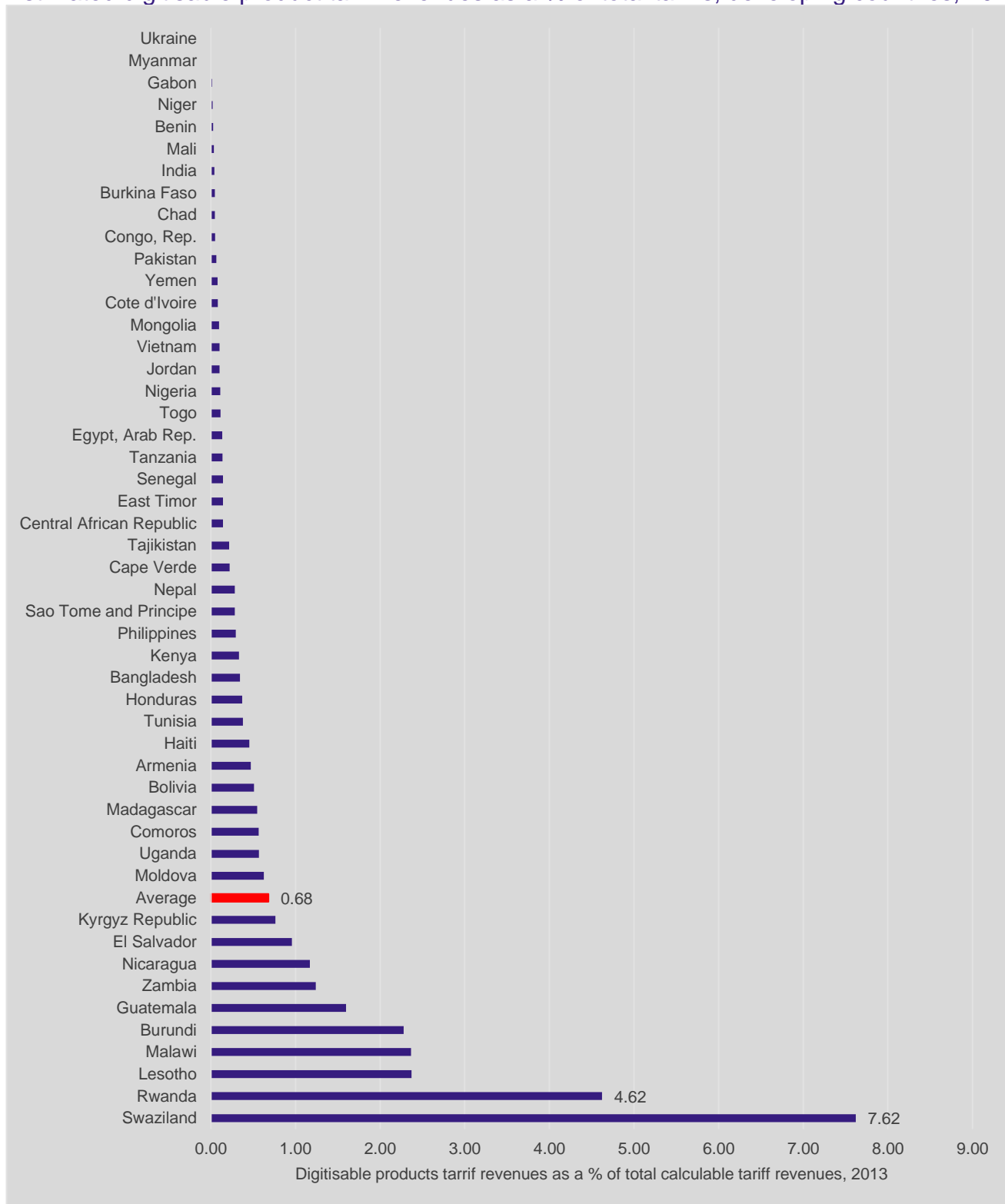
## ANNEX 2: ESTIMATING DIGITISABLE PRODUCT TARIFF REVENUES AS A PROPORTION OF TOTAL TARIFF REVENUES, DEVELOPING COUNTRIES,<sup>19</sup> FOR 2013

Given the lack of data on e-commerce (and therefore applicable tariffs), to accompany the tariff analysis using the high-technology goods list proposed in the main body of the paper, we also attempt to estimate the tariff burden on digital products traded via e-commerce in developing countries.

As there are no suitable data to give an accurate representation of these volumes, we need a simulation. This is constructed by posing the question, 'What is the opportunity costs, in terms of tariff losses, of the removal on tariffs on goods that could be digitised?' The question allows us to provide an initial basic (and theoretic) estimation of digital good trade in developing countries, using existing trade data on physical goods to estimate impacts on digital goods. The dataset is based on the volume of imports of digitisable products, with the list based on the methodology elaborated in Makoni et al. (2013), originally used for Zimbabwe and adapted to apply for all developing countries. A similar list for ICT goods was developed by Bourassa (2011); however, given its inclusion of physical products, we initially favoured the Makoni et al. process as WTO proposals do not include the removal of tariffs for machinery that may enable e-commerce.

<sup>19</sup> Only including countries where data are available.

Estimated digitisable product tariff revenues as a % of total tariffs, developing countries, 2013

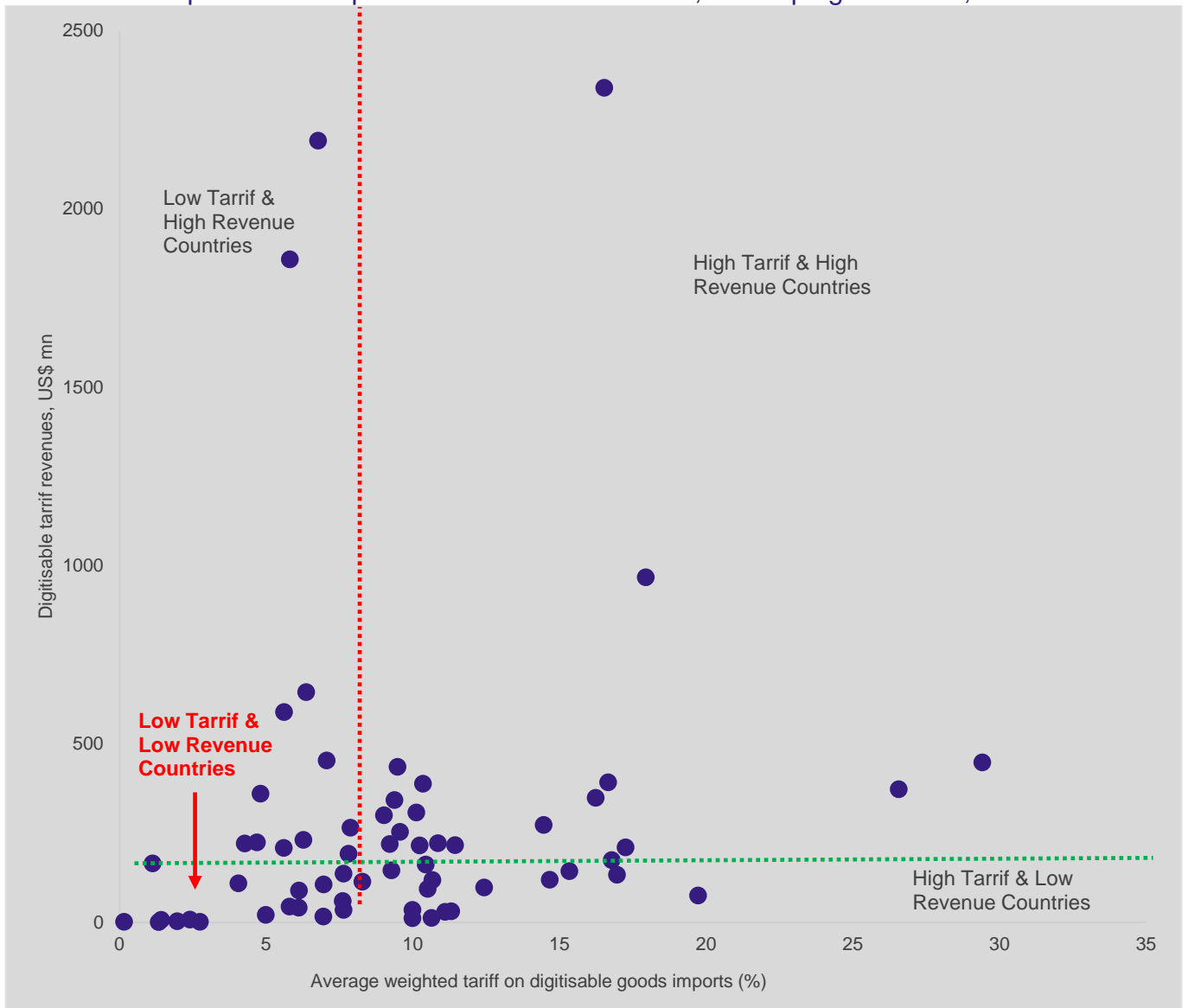


Source: Own calculations based on WTO WITS (2017).

The data are, however, limited in terms of developing country coverage, as they include only 60 countries that have matching data on dutiable trade volumes, tariffs for the same year and digitisable trade data and tariffs, with 2013 representing the best fit year for data availability. The full results of the simulation are highlighted in the figure above; the figure below illustrates the relationship between import volumes and tariff rates, where most developing countries have both low tariff rates and low revenue volumes from these tariffs. The clearest implication is that the removal of tariffs, while promoting greater exports of high-tech goods (as shown in the main body of the paper), may have limited impact on

revenues generated from import tariffs on digitisable goods, indicating a (potential) low opportunity cost of removing subsidies on such products, even though high-tech goods and the digitisable product basket are not directly related.

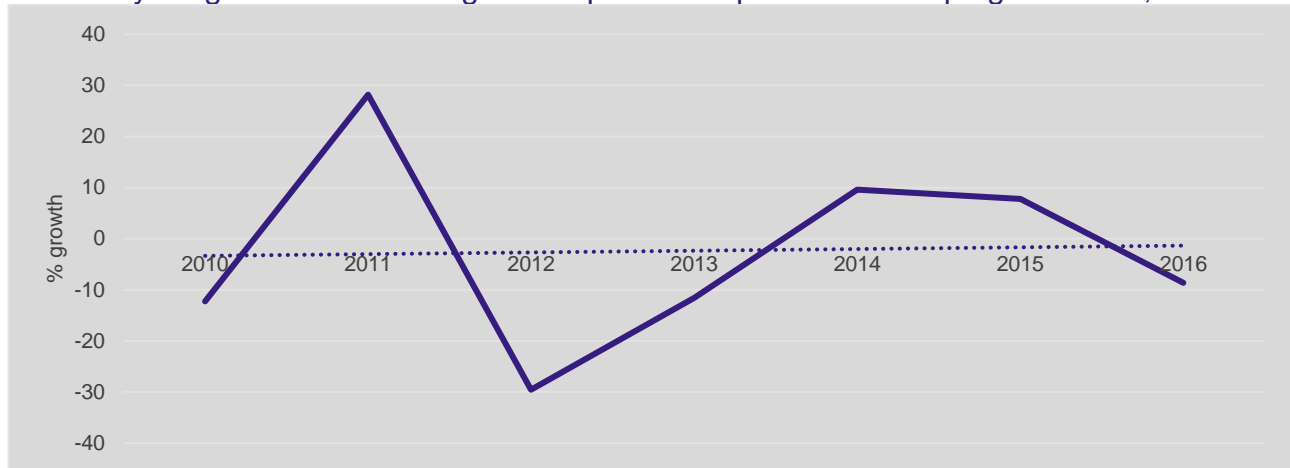
The relationship between import volumes and tariff rates, developing countries, 2013



Source: Own calculations based on WTO WITS (2017).

It is important to bear in mind that one other important caveat applies to the illustration above: there is no guarantee that these products are analogous to those currently being traded through digital means. In addition, their significance may not be particularly high to developing countries, as year-on-year growth rates in developing country imports of digitisable products between 2010 and 2016 show significant variation throughout the seven-year period. The trend, though negative, shows an increase in the average growth rate.

## Year-on-year growth rates for digitisable product imports in developing countries, 2010-2016



Source: WTO WITS (2017).

If the importance of these products is decreasing, a removal of tariffs on these products, in either their physical or their digital form, would become irrelevant in the long term. On the other hand, if physical good imports are being substituted by digital imports then tariff reduction could represent a loss of revenue for developing countries. As the simulation is based on an attempt to quantify a 'what-if' scenario, there is no plausible answer as to which is most likely.

## ANNEX 3: REGRESSION RESULTS – HIGH-TECHNOLOGY GOODS AND TARIFFS

The matrix table below summarises the regression results of the ISIC Rev. 3 High Technology Classification list, between 1988 and 2016, for:

- Developing country imports (US\$ billion, nominal) from all partner countries (DIM);
- Developing country exports (US\$ billion, nominal) to all partner countries (DEX);
- Developing country exports (US\$ billion, nominal) to OECD countries (DEXO);
- Weighted average tariffs on imports to developing countries (TARD);
- Weighted average tariffs on imports to all countries (TARW);
- Weighted average tariffs on imports to OECD countries (OTAR);
- GDP (US\$ billion, nominal) for all countries (WGDP);
- GDP (US\$ billion, nominal) for developing countries (DGDP);
- GDP (US\$ billion, nominal) for OECD countries (OGDP).

	DEX	Ln(DEX)	DIM	Ln(DIM)	DEXO	Ln(DEXO)
<b>TARW</b>	-3.39					
<b>Ln (TARW)</b>		-0.036				
<b>TARD</b>			-2.16**			
<b>Ln (TARD)</b>				-0.78***		
<b>OTAR</b>					-1.69	
<b>Ln (OTAR)</b>						-0.07
<b>WGDP</b>	0.0014					
<b>Ln (WGDP)</b>		3.06				
<b>DGPD</b>			0.02			
<b>Ln (DGDP)</b>				0.42		
<b>OGDP</b>					0.001	
<b>Ln (OGDP)</b>						3.14
<b>Constant</b>	-20.56		33.83	2.04	-7.61	-30.4
<b>Observations</b>	29	29	29	29	29	29
<b>Confidence</b>	0.462	0.934	0.021	0.000	0.338	0.744

## ANNEX 4: IMPROVED ACCESS TO THE INTERNET

We assessed whether there is a relationship between the percentage of ICT goods imported/exported and services exported in relation to the digital infrastructure capacity within a country. To do so, we undertook regression analysis using a sample of 163 countries available in the World Bank WDI 'The Information Society' category, for years 2015-2016, for all the variables available, including:

### *Independent factors*

- Individuals using the internet (% of population);
- Fixed broadband subscribers (per 100 people);
- International internet bandwidth speed: bits per second per internet user;
- Fixed broadband sub-basket (US\$ per month);
- Secure internet servers (per 1 million people).

### *Dependent factors*

- ICT goods exports (% of total goods exports);
- ICT goods imports (% of total goods imports);
- ICT service exports (% of service exports, balance of payments).

Regressions among the various indicators were carried out, initially based on the hypothesis that the percentage of either ICT goods or ICT services exported may be dependent on one of the five independent factors (listed above). The results found that the only significant relationship was between the percentage of ICT service exports and the number of fixed broadband subscribers, where the relationship was significant (less than 1%) and positive, though quite small in nature, where a 1% increase in the number of fixed broadband subscribers could increase the proportion of ICT service exports (as a percentage of all service exports) by 0.22%.

Speculating on the significance of this relationship is problematic. One (speculative) hypothesis could be that, as commercial entities rely on fixed broadband subscriptions, greater use of fixed broadband would mean greater participation in the ICT services sector. The small change in services output could owe to the larger ratio of personal fixed broadband users to commercial fixed broadband users, which would mean that most new subscribers would be using the internet for personal (rather than commercial) reasons, hence not contributing to the ICT services sector.

Computing a similar regression solely for developing countries, using a sample of 64 developing countries, finds that the only small but positive and significant relationship exists between ICT goods exported (as a percentage of total goods exports) and the number of internet users (per 100 people), where a 1% increase in the number of internet users in a country could result in a 0.12% increase in ICT goods exports representation of total goods exports. Unlike the global sample, there is no significant relationship between any of the other variables and ICT services exports.

Looking at the results using an economic transformation lens would indicate that greater access to the internet could, marginally, contribute to participation in higher-value activities – in the general context through an increase in the export of high-technology goods; from a developing country point of view through greater participation in ICT-related services.