



International Centre for Trade  
and Sustainable Development

# The Digital Transformation and the Transformation of International Trade

---

Dan Ciuriak and Maria Ptashkina

January 2018

Issue Paper



[rtaexchange.org](http://rtaexchange.org)

# Acknowledgements

## Published by

International Centre for Trade and Sustainable Development (ICTSD)  
7 Chemin de Balexert, 1219 Geneva, Switzerland  
Tel: +41 22 917 8492 – [ictsd@ictsd.ch](mailto:ictsd@ictsd.ch) – [www.ictsd.org](http://www.ictsd.org)  
Publisher and Chief Executive: Ricardo Meléndez-Ortiz

Inter-American Development Bank (IDB)  
1300 New York Avenue, N.W., Washington, D.C., 20577, USA  
Tel: +1 202 623 1000 – [www.iadb.org](http://www.iadb.org)

## Acknowledgements

This paper has been produced under the RTA Exchange, jointly implemented by the International Centre for Trade and Sustainable Development (ICTSD) and the Inter-American Development Bank (IDB). For more information on the RTA Exchange, please visit [www.rtaexchange.org/](http://www.rtaexchange.org/)

The RTA Exchange is managed by Marie Chamay, Director of Strategic Initiatives, and Christophe Bellmann, Senior Resident Research Associate, with the support of Emily Bloom, Project Officer, RTA Exchange at ICTSD, in collaboration with Antoni Estevadeordal, Manager, Integration and Trade Sector, Jeremy Harris, Economist and Integration and Trade Specialist, and Mayra Salazar Rivera, Consultant at the IDB.

This issue paper is one of a series of papers developed by the RTA Exchange that explore digital trade-related provisions in regional trade agreements.

Dan Ciuriak is Director and Principal at Ciuriak Consulting Inc.

Maria Ptashkina is a PhD student at University Pompeu Fabra, Barcelona, and Bridges Graduate Fellow at ICTSD.

An earlier version of this paper was prepared for the Panel Session on Liberalisation and Market Access at the conference “Trade-Related Provisions in Regional Trade Agreements,” RTA Exchange, Geneva, 13 July 2017. The authors thank Andrew Crosby and Felipe Sandoval for encouragement to develop this paper and for very helpful comments on a first draft, and Natassia Ciuriak for editing the manuscript.

**Citation:** Ciuriak, Dan, and Maria Ptashkina. 2018. *The Digital Transformation and the Transformation of International Trade*. RTA Exchange. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and the Inter-American Development Bank (IDB). [www.rtaexchange.org/](http://www.rtaexchange.org/)

Any views expressed in this publication are the authors’ personal responsibility and should not be attributed to ICTSD or IDB.

**Copyright** ©ICTSD and IDB, 2018. Readers are encouraged to quote and reproduce this material for educational and non-profit purposes, provided the source is acknowledged. This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivates 4.0 International License. To view a copy of this license, visit: <https://creativecommons.org/licenses/by-nc-nd/4.0/>

ISSN 2520-2278

# Contents

EXECUTIVE SUMMARY	vi
1. INTRODUCTION	1
2. BACKGROUND	2
3. MODES OF DIGITAL TRADE	3
3.1 Mode 1: Digital Products and the Transition from Country-Based to Company-Based Trade	4
3.2 Mode 2: Bricks and Clicks and the Second Unbundling—Digitally Enabled Trade	5
3.3 Mode 3: The Third Unbundling—Households Enter into Trade	5
3.4 Mode 4: Mobilising Household Labour Supply	5
3.5 Mode 5: Data Flows—Barter Trade for Capital Benefits	6
4. BARRIERS TO DIGITAL TRADE	6
5. UNITED STATES, EUROPEAN UNION, AND CHINA: DIGITAL DIVIDES AND RIFT VALLEYS	9
5.1 Data Localisation and Privacy	10
5.2 Net Neutrality and Competition	11
5.3 Contingent Work Policy Differences Loom Larger with the Expansion of the Gig Economy	12
5.4 Censorship and Digital Content	13
5.5 Intellectual Property Rights	13
6. TOWARDS A FORWARD-LOOKING AGENDA	14
ANNEX 1: REVIEW OF BACKGROUND ISSUES	16
ANNEX 2: RTA DESIGN: TPP, CETA, AND RCEP	23
REFERENCES	32

## **List of Tables and Boxes**

Table 1. Modes of digital and digitally enabled trade	4
Table 2. Alternative categorisations of barriers to digital trade	7
Table A1. Comparison of the provisions of electronic commerce chapters in TPP and CETA	25
Box A1. An overview of internet governance	16
Box A2. The TPP and CETA compared	23

## List of Abbreviations

AI	artificial intelligence
B2B	business to business
B2H	business to household
BRICS	Brazil, Russia, India, China, South Africa
CETA	Canada–EU Comprehensive Economic and Trade Agreement
ChAFTA	China–Australia Free Trade Agreement
CPTPP	Comprehensive Progressive Agreement for Trans-Pacific Partnership
CRS	Congressional Research Service
DDE	data-driven economy
DRAM	dynamic random access memory
DSM	Digital Single Market
DTE	digital trade estimates
ECIPE	European Centre for International Political Economy
FTA	free trade agreement
G7	Group of Seven (advanced economies)
G20	Group of Twenty (advanced and emerging economies)
GATS	General Agreement on Trade in Services
GDP	gross domestic product
H2B	household to business
H2H	household to household
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	information and communication technology
IoT	Internet of Things
IP	intellectual property
KBE	knowledge-based economy
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Co-operation and Development
RCEP	Regional Comprehensive Economic Partnership
RTA	regional trade agreement
SMEs	small and medium-sized enterprises
SOE	state-owned enterprise
TPP	Trans-Pacific Partnership
UNCITRAL	United Nations Commission on International Trade Law
USTR	United States Trade Representative
VAT	value-added tax
WTO	World Trade Organization

## Executive Summary

The digital transformation has facilitated old modes of trade and business models and enabled the creation of entirely new ones. World Trade Organization (WTO) rules are technologically neutral and thus apply fully to the new trade modes. However, new trade frictions arise as the new modes are dependent on access to the internet and to cross-border flow of data. In part, these new frictions reflect new regulatory concerns in areas that range from privacy, to ensuring tax neutrality across different modes of trade, to conditions of competition. In part, they arise from the divergence in interests and policies of the major digital economies. The future framework for the governance of digital commerce is thus an open issue; regional trade agreements (RTAs) and the WTO work programme following the 11<sup>th</sup> Ministerial Conference held in Buenos Aires in December 2017 will seek to shape how this framework develops.

Data is different. In addition to its ancillary role in delivering conventional goods and services, data has intrinsic value in developing artificial intelligence (AI) capabilities and in enabling targeted marketing. Data for these latter purposes is acquired through what is effectively barter exchange: in the case of consumer data, firms provide the “free” service of use of their platforms in implicit exchange for the data such use generates. This form of exchange leaves no paper trail in the form of receipts or payments and is thus difficult to measure. However, preliminary estimates based on consumer benefits and alternatively on the market valuation of the intangible capital these data generate for the platform providers suggest the value of such trade is large indeed.

Accordingly, data is traded across borders on a value-for-value basis, even if the value proposition in the transactions is not reflected in trade or payments statistics. Moreover, given that data is the essential capital stock for developing artificial intelligence (AI) capabilities, access to data becomes a critical factor for participation in the new industrial era of the knowledge-based and data-driven economy (KBE/DDE). As applications in the Internet of Things (IoT) spread and their penetration deepens, the importance of data flows in international commerce rises steeply. By the same token, the digital transformation requires adding a fifth item to the traditional list of issues addressed by trade policy: movement of goods, persons, services, capital, and data. Moreover, since the economics of the KBE/DDE feature steep economies of scale and powerful network externalities, increased market concentration and strategic trade rivalry are expected.

The economics of the digital economy also promotes skewing of distributional gains, with skilled workers and connected individuals moving ahead, while others fall behind. This is consistent with the emergence of a digital divide between and within countries. The deepening of the KBE/DDE promises to further exacerbate these divides, particularly by excluding the disconnected from the new opportunities offered

in the rapidly evolving digital world. In turn, this points to socio-economic pressures that militate against digital economy openness.

The breadth of definitions of digital and digitally enabled trade suggests the need to parse out the activities that fall under this broad rubric into different modes. We propose a five-mode framework:

- Mode 1: “digital to real” transactions, including provision of access to the internet.
- Mode 2: “real to real” business to household (B2H) and business to business (B2B) transactions with digital intermediation.
- Mode 3: “real to real” household to household (H2H) transactions with digital intermediation.
- Mode 4: “real to real” household to business (H2B) transactions with digital intermediation.
- Mode 5: the capitalisation of data flows.

We also parse out frictions that have been identified by various stakeholders into eight analytical categories, and discuss their specific relevance by mode:

- 1 Frictions in the enabling environment
- 2 Technical trading restrictions
- 3 Technology barriers
- 4 Data localisation requirements
- 5 Intellectual property (IP) rights
- 6 Establishment restrictions
- 7 Fiscal restrictions
- 8 State-owned enterprises (SOEs) and public sector procurement

The first four categories feature issues that are specific to the digital realm; the second four are well-known analogues from the physical realm.

Against this background, we consider the differences in approaches to these issues of the United States, the European Union and China as reflected in the e-commerce and data provisions in respectively the Trans-Pacific Partnership, the EU-Canada Comprehensive Economic and Trade Agreement, and the China-Australia Free Trade Agreement. Each is playing the hand it has been dealt. The United States and Europe share a broadly similar vision about the organisation of markets, but the United States has a large first mover advantage and naturally seeks maximum openness to exploit the benefits and lock in the competitive advantage of US technological giants in digital trade. For Europe, having lost the lead to the United States, the main incentive is to minimise the adjustment costs and risks of the digital transformation. It thus becomes the regulatory champion. China, while playing catch-up, has a numbers advantage which it is exploiting to accelerate its progress up the learning curve in order to emerge as a strategic rival for rent capture in the emerging KBE/DDE.

These differing incentives and interests lead to differences in positions on data localisation and privacy; net neutrality and competition policy; labour market policies regarding “contingent work” in the so-called “gig economy” enabled by the KBE/DDE; censorship and digital content; and treatment of intellectual property issues in the digital realm.

The small open economies find themselves most closely aligned with the European Union in the sense that their defensive interests (dealing with the fallout from digital disruption) outweigh their offensive interests (the capture of market share in the emerging KBE/DDE). The large-population emerging markets have the option of following China’s strategy but for the smaller developing economies, especially in Africa, the expedient tactic is to capture consumer benefits of access to the “free” content on the internet and to use the digital economy framework to participate in global commerce as best they can given the realities of the digital divide.

This broad-brush analysis points to the likelihood of a drift towards balkanisation of the digital economy at least in the near term, with potential for digital trade conflicts centred on regulations (European Union versus United States) and on market access (European Union and the United States versus China and perhaps other BRICS).

The WTO has been largely on the sidelines in shaping the framework for digital and digitally enabled trade; this did not change with the WTO Ministerial in Buenos Aires. While consideration should be given to forming an analogue to the “Really Good Friends of Services” to energise the work programme towards a WTO consensus and support the public-private dialogue launched at the Ministerial, the action will continue to unfold in RTAs. However, the momentum here is likely to peter out if and when the major RTAs under negotiation take effect.

This suggests that the European Union, which features a rich regulatory “sandbox,” will be best placed to chart the way around the rocks and shoals of the digital economy as well as reconciling industrial policy flexibility with an open trading framework.



# 1. Introduction

The digital transformation has facilitated old modes of trade and business models and enabled the creation of entirely new ones. Digital disruption is being felt across all modes: digital versions of products or services compete with physically embodied versions and digital distribution/facilitation business models compete with traditional distribution business models. Net neutrality, digital market access, data localisation and freedom of cross-border data flows, privacy, and conditions of competition are just a few of the regulatory issues raised as the digital transformation transforms the way international trade is conducted.

While the negotiation of a broadly accepted multilateral regime under the World Trade Organization (WTO) is nowhere close to launch, regional trade agreements (RTAs) have plunged ahead and developed prototype regimes of varying structures, coverage, and depth (M. Wu 2017) to address frictions that have surfaced and to lock in an open environment for digital and digitally enabled trade.

In principle, WTO rules for trade are technologically neutral. Thus, the rules of the General Agreement on Tariffs and Trade apply to goods regardless of the role of digital facilitation. Similarly, the General Agreement on Trade in Services (GATS) makes no distinction between the different technological channels by which a service may be delivered—whether in person, embodied in a physical product (e.g. a document shipped by mail), by telecommunications facilities, or in digitised mode across the internet. This has been confirmed by WTO dispute panels in *US – Gambling* (DS285) and *China – Publications and Audiovisual Products* (DS363). The electronic delivery of services can take place under any of the four modes of supply, including GATS Mode 4, “movement of labour.” Similarly, intellectual property (IP) rules cover IP rights related to digital trade in equal measure to the protection offered to IP rights related to convention trade.

Accordingly, a wide range of disciplines that are applicable to non-digital trade modes also apply by default to digital trade, even in the absence of a regime specific to digital trade. By the same token, conventional trade barriers also impede digital trade and, likewise, conventional trade liberalisation promotes digital trade. Underscoring this reality, digital trade is treated as a cross-cutting issue in the WTO framework, with work programmes mandated for the Council for Trade in Services, the Council for Trade in Goods, the Council for the Agreement on Trade-Related Aspects of Intellectual Property Rights, and the Committee on Trade and Development.

At the same time, digital and digitally enabled trade is dependent on access to the internet itself and, in particular, on cross-border data flows. These new forms of trade are thus susceptible to new trade frictions. Traditionally, liberalising trade was identified with four freedoms: the free movement of goods, services, capital, and persons. These are the foundation of the Single Market of the European Union (EU). The digital transformation now requires adding a fifth freedom to the list: the free movement of digital information (ECIPE 2017). Thus, for example, the European Union’s Digital Single Market (DSM) Strategy now aims to ensure the free movement of goods, persons, services, capital, and data.

In addition to this ancillary role in delivering goods and services, data has intrinsic value when assembled into databases for use in developing artificial intelligence (AI) capabilities or in enabling targeted marketing. Data for this purpose is acquired through what is effectively barter exchange: firms provide the “free” service of use of their platforms in implicit exchange for the data such use generates. This form of exchange leaves no paper trail in the form of receipts or payments and is thus difficult to measure—even in a purely domestic context, let alone on a cross-border basis. However, preliminary measures suggest that, even in the early days of the data-driven economy (DDE), this value is not inconsiderable: for the United States in 2015, the consumer benefits on this side of this barter exchange have been estimated at about

US\$300 billion or 1.8 percent of gross domestic product (GDP) (Nakamura, Samuels, and Soloveichik 2017, calculated from Table 3).

An alternative approach is to focus on the value of data as part of the intangible capital of such firms as Amazon, Facebook, and Google (Ciuriak 2017a). In this regard, Monga (2016) observes that the difference between Facebook's assets minus liabilities could serve as a proxy for the value of its user data, the algorithms it uses to mine the data, and its brand. This places the share of intangibles in Facebook's assets at about 86 percent of its total value in 2014. While the total intangible assets would also include the value of patents, copyrights, etc., for a data-driven firm like Facebook, the share of this valuation deservedly attributable to data would appear to be large—and growing.

These considerations underscore that data are indeed traded across borders on a value-for-value basis, even if the value at one end of the transactions is captured by the acquiring firm through secondary processing and value proposition in the transactions is not reflected in trade or payments statistics. Moreover, given that it is the essential capital stock in the modern knowledge-based and data-driven economy (KBE/DDE), this aspect of data flows gives rise to the nexus of issues typically associated with industrial and strategic trade policy. As applications in the Internet of Things (IoT) spread and their penetration deepens, the importance of data flows in international commerce will rise steeply.

These observations have implications for the way that we structure the discussion and analysis of trade in the digital age. We seek to contribute to this discussion by developing a typology of the alternative modes of trade in the digital era, categorising the frictions and concerns that have been identified by stakeholders and governments and reviewing how RTAs are moving to address them.

This paper is organised as follows. Section 2 provides background (summarising a more detailed discussion in Annex 1). Section 3 proposes a modal typology

for digital trade. Section 4 examines and classifies barriers to digital trade identified by governments and business. Section 5 examines the Trans-Pacific Partnership (TPP), the Canada–EU Comprehensive Economic and Trade Agreement (CETA) regimes for digital trade as the leading examples of approaches to regulate digital trade and compares this to the China–Australia Free Trade Agreement as an example of China's preferences. Section 6 discusses and draws preliminary conclusions.

## 2. Background

A number of issues confront the governance of trade in the digital age—both as regards trade in digital products proper and digital facilitation of old modes of trade. This section summarises the main issues; Annex 1 develops the supporting discussion in more depth.

As trade shifts into the digital realm, trade norms, rules, and procedures have to be reconciled with those developed for internet governance. While the underlying principles on which the internet was developed are well aligned with the key WTO principles of non-discrimination and most-favoured-nation treatment, frictions are emerging in part due to the divergence in interests and policies of the major digital economies. The shape of the future framework for the governance of digital commerce is an open issue and controversies have emerged when RTAs have intervened in digital regulation. Trade governance in the digital realm will likely be more a rules taker than a rules maker in the digital realm. The economics of the KBE/DDE feature steep economies of scale and powerful network externalities, which create conditions for the emergence of superstar firms that gain quality advantages. As the KBE/DDE deepens and the use of AI spreads across sectors, the scope for these effects will expand. Importantly, the economics of superstars points not only to high market concentration, but also to rent capture. In an international setting, this in

turn points to strategic trade rivalry. Trade peace is not to be expected.

The economics of the digital economy also promotes skewing of distributional gains, with skilled workers and connected individuals moving ahead, while others fall behind. This is consistent with the emergence of a digital divide between and within countries. The deepening of the KBE/DDE promises to further exacerbate these divides, particularly by excluding the disconnected from the new opportunities offered in the rapidly evolving digital world. In turn, this points to socio-economic pressures that militate against digital economy openness.

Against this background, considerable work is being done to establish an analytical framework and develop policy tools to facilitate decision-making. Importantly, work is underway to classify modes of digital and digitally enabled trade and to categorise the frictions that are emerging.

- Digitally enabled trade has been referred to as the “third unbundling,” allowing international trade to penetrate deeper into national economies.
- Households become players in trade in new ways, posing challenges for economic governance centred on firms.
- The new modes of trade further distance us from the concept of trade as being between countries—in the cloud, trade truly becomes company trade.
- Data flows emerge as a key new area for governance.

These issues inform our discussion of the modes of digital and digitally enabled trade, the classification of trade frictions in the digital age, and the review of how trade rules address them.

### 3. Modes of Digital Trade

There does not appear to be a uniformly accepted definition of the scope of digital trade. The WTO Work Programme on Electronic Commerce (WTO 1998) provides the following very general definition of the scope of e-commerce: “Exclusively for the purposes of the work programme, and without prejudice to its outcome, the term ‘electronic commerce’ is understood to mean the production, distribution, marketing, sale or delivery of goods and services by electronic means.” Meanwhile, the United States International Trade Commission defined e-commerce as “Transactions conducted over the Internet or using Internet technologies” (USITC 2013). However, it provides a narrower definition of digital trade as “commerce in products and services delivered via the Internet,” which excludes “commerce in most physical goods, such as goods ordered online and physical goods that have a digital counterpart such as books and software, music, and movies sold on CDs or DVDs.” USITC (2016), however, broadened the definition to include “domestic commerce and international trade in which the Internet and Internet-based technologies play a particularly significant role in ordering, producing, or delivering products and services.”

From the perspective of developing a checklist of barriers to e-commerce, the breadth of the definition suggests the need to parse out the activities that fall under the broad rubric of e-commerce or digital trade into modes, as has been done for services under the GATS and for public procurement by Cernat and Kutlina-Dimitrova (2015). The literature has discussed modes of trade in connection with digital forms (Tuthill 2016; López González and Jouanjean 2017). We propose a five-mode framework along the lines of Table 1.

**Table 1.**

Modes of digital and digitally enabled trade

Mode	Type	Examples and Business Models
<b>Mode 1</b>	“Digital to real” transactions, including provision of access to the internet	Web search, e-learning, gaming, mobile applications, online gambling, communication services (such as WhatsApp or Skype), information services (such as maps and online encyclopaedias), online advertising, Netflix, etc.
<b>Mode 2</b>	“Real to real” business to household (B2H) and business to business (B2B) transactions with digital intermediation	Amazon and other distributional services; also travel services (hotel bookings, flight reservations), purchasing software, etc., provided on a B2H basis; for business services, this captures “trade in tasks” conducted on a B2B basis
<b>Mode 3</b>	“Real to real” household to household (H2H) transactions with digital intermediation	Peer-to-peer transactions (eBay, Uber, AirBnB) from H2H, digitally mediated
<b>Mode 4</b>	“Real to real” household to business (H2B) transactions with digital intermediation	Platform-based providers of household services to business (Fiverr, Upwork)—which amounts to GATS Mode 4 trade (movement of persons) conducted through digital enablers; this captures trade in tasks conducted on a H2B basis
<b>Mode 5</b>	The capitalisation of data flows	Personal data (Facebook, Google), data generated over the Internet of Things, financial and personal data of online consumers (Alipay) with cross-border flows on a “bot-to-bot” basis, with no receipts or payments attached and value captured through secondary processing of accumulated data acting as the capital stock for industrialised learning

### 3.1. Mode 1: Digital Products and the Transition from Country-Based to Company-Based Trade

The scope of Mode 1 trade is confined to digital products that are either downloaded, accessed through streaming, or accessed on the cloud. Web search, e-learning, gaming, mobile applications, online gambling, communication services (such as WhatsApp or Skype), information services (such as maps and online encyclopaedias), and online advertising are examples of Mode 1 supply. It also encompasses business models, such as Netflix, predicated on the *modus vivendi* of the millennial generation, which prioritises access over ownership.

The first question that arises in these instances concerns the location of the source and destination country. There is no obvious answer to this, since the cloud has no specific earthly location, value chains

in business services may be globally distributed, and transactions can take place anywhere in the world—for example, a Canadian can download an online article, while travelling in the United Kingdom, from a server located in Korea, facilitated by a corporation based in the United States. Server location as a guide to source country is compromised by the Software or Infrastructure as a Service (SaaS or IaaS) business models.

When money changes hands as a result (that is, when there is a commercial transaction), tax principles will likely determine the geographical basis for the trade. Guidelines from the Organisation for Economic Co-operation and Development (OECD) addressing tax base erosion and profit shifting suggest that, in principle, the source country is where the profits are taxed, where economic activities generating the profits are performed, and where value is created (OECD 2014a). This brings the cloud down to earth. For tax fairness determinations in B2H transactions,

the destination under EU guidelines is determined by the location of the consumer—for example, if a private person residing in Sweden makes use of a Japanese online service, Swedish value-added tax (VAT) will have to be paid on the amount the Japanese company charges. The location of the customer will generally be based on billing address or other information (bank details, country code of phone number, etc.)

However, as with all tax matters, things get complicated very quickly: as an EU advisory states, a French private customer with a Swiss telecoms operator using her mobile phone in France will be charged French VAT; when using his mobile phone in Greece, Greek VAT will be charged for the calls made from Greece (see, e.g., the EU guidelines for “where to tax”<sup>1</sup>).

As the above examples demonstrate, Mode 1 trade is truly company-based trade, not country-based trade.

### **3.2. Mode 2: Bricks and Clicks and the Second Unbundling—Digitally Enabled Trade**

Mode 2 covers digitally enabled trade in goods and services. This includes the “bricks and clicks” business model (with either storefront or warehouses representing the “bricks”), which competes head-to-head with established storefront distribution models. Such trade is captured in principle by traditional statistics on international trade, although use of this mode likely compromises the quality of product classification and raises questions about the relevance of free trade agreements (FTAs) since these are not designed to facilitate retail cross-border transactions.

Provision of “real” non-digital services through the internet also falls into this mode of supply. These include, for example, travel services, such as hotel

<sup>1</sup> [https://ec.europa.eu/taxation\\_customs/business/vat/eu-vat-rules-topic/where-tax\\_en](https://ec.europa.eu/taxation_customs/business/vat/eu-vat-rules-topic/where-tax_en)

bookings or flight reservations, and purchasing software, as well as outsourced “trade in tasks,” the driver of the “second unbundling.”

### **3.3. Mode 3: The Third Unbundling—Households Enter into Trade**

Mode 3 consists of peer-to-peer transactions and thus represents H2H trade. It is intermediated through business models of firms such as eBay, Uber, and AirBnB, and results in the disintermediation of established businesses. This mode raises new issues, as it transfers rents, challenges or compromises established taxation and regulatory regimes (e.g., hotel regulations<sup>2</sup> and taxes), and may not be captured by traditional trade statistics. At the same time, it can increase the utilization of—and thus return to—existing assets. For example, increased use of housing for Airbnb in Barcelona has contributed to an unprecedented rise in city rental prices.

### **3.4. Mode 4: Mobilising Household Labour Supply**

Mode 4 in digital trade corresponds to GATS Mode 4 trade and captures “trade in tasks” from households that is digitally mediated. A relatively new model of freelance networks generates this mode of supply. Such platforms as Fiverr and Upwork connect service providers to businesses across borders, thus creating an H2B transaction environment—the international extension of the “gig economy,” which can alter traditional labour markets and impact competition conditions in factor markets.

<sup>2</sup> An example of the need to extend conventional regulatory surveillance is provided by a case of racial discrimination by an AirBnB host, which was addressed pursuant to an agreement between AirBnB and California’s Department of Fair Employment and Housing (Lee 2017).

For example, a German start-up company may wish to hire the cheaper services of a Philippine website designer through Fiverr, rather than hiring a German worker. This creates a seemingly H2B transaction environment.

### 3.5. Mode 5: Data Flows—Barter Trade for Capital Benefits

Categorising Mode 5 is more complicated. Data flows are not, for the most part, digital transactions, because, except where data is a product, there is no payment and no paper trail of invoices and receipts. These flows are, however, integral to—and essential enablers of—digital and digitally enabled trade in all four of the other modes.

In a trade facilitation sense, they are not new: electronic data interchange flows have long been part of the institutional framework of international commerce. What is new in the DDE is the compilation of data into databases that are the essential capital in the age of AI.

These data include most prominently the personal data compiled by such platforms as Facebook and Google, which underpin their vast market capitalisation, which itself is premised on their ability to exploit the search, consumption, transaction, and location data to capture advertising expenditures. Similarly, payments systems integrated with other services, such as China's Alipay and Alibaba, can shape markets by providing tailored advertising, altering the competitive landscape.

More broadly, of relevance across a wide swathe of industries, data generated over the Internet of Things, coupled with machine learning technologies, which are being introduced on an ever wider scale, enable process optimisation and potentially other advantages that, at this early stage, can only be sensed. The Office of the United States Trade Representative (USTR) estimates the IoT will comprise, by 2024, some 27 billion devices (including cars, refrigerators, airplanes, and even buildings) (USTR 2017),

continuously generating and transmitting data that provide the recipient firms with a competitive edge. It is the capitalisation of data that drives commercial gains and, thus, represents the value proposition of Mode 5 digital trade. This is one sense in which data are different. Another is that, while innovative firms can work around others' patents, they cannot work around lack of access to data to train their own algorithms. Access is the key issue. Thirdly, insofar as AI represents the industrialisation of *learning*, it promises the proliferation of superstar firms and rising concentration.

## 4. Barriers to Digital Trade

Since digital and digitally enabled trade have emerged, for the most part, in the highly open post-WTO era and through new enabling technologies for which trade restrictions have not yet had a chance to evolve, there is less of a need to liberalise such trade. Rather, there is a need to prevent the adaptation to the digital realm of trade protections prevalent in the pre-existing physical modes of trade—viz the WTO moratorium on application of tariffs to electronic transmissions.

However, issues are flaring and triggering regulatory pushback in many forms. In part, this reflects the impact of the digital transformation on the ability of governments to implement domestic regulatory policies, including in such areas as privacy and cybersecurity, and to collect taxes. Moreover, given the incentives for strategic trade policy inherent in the economics of the KBE/DDE, nations are moving to capture international rents, including by such measures as China's Great Firewall, a system of censorship of online content and services accessible by Chinese customers from external suppliers, thus providing room for domestic competitors to establish, gain scale, and position themselves to enter international markets.

We consider alternative categorisations of the barriers to digital trade by both government and business. Business plays an important role in shaping policymaking, including in the context of international agreements. Business lobbying interventions in the area of e-commerce and data privacy thus represent an important guide to where frictions and issues lie. Table 2 provides a preliminary categorisation of the frictions and barriers that have emerged from this tension, based on business lobbying interventions in the area of e-commerce and data privacy and on government policy statements. We use four sources: European Centre for International Political Economy (ECIPE 2017), Business Europe (2017), USTR (2017),

and the Congressional Research Service (CRS) (Fefer et al. 2017). We suggest a grouping of these frictions into eight analytical categories:

- 1 Frictions in the enabling environment
- 2 Technical trading restrictions
- 3 Technology barriers
- 4 Data localisation requirements
- 5 IP rights
- 6 Establishment restrictions
- 7 Fiscal restrictions
- 8 State-owned enterprises (SOEs) and public sector procurement

## Table 2.

Alternative categorisations of barriers to digital trade

ECIPE	Business Europe	USTR	CRS
<b>Frictions in the Enabling Environment</b>			
<ul style="list-style-type: none"> <li>Content access (bandwidth, net neutrality, censoring and filtering of web content)</li> <li>Data policies (administrative requirements on data privacy, data retention, personal right to data privacy, sanctions for non-compliance)</li> </ul>	<ul style="list-style-type: none"> <li>Restrictions and discriminatory rules on online sales and transactions (including bans on operations)</li> <li>Exclusion of foreign firms from participating in local markets</li> <li>Local presence requirements</li> </ul>	<ul style="list-style-type: none"> <li>Inappropriate application of old regulatory regimes to new business models</li> <li>Unreasonable burdens on internet platforms for non-IP-related liability for user-generated content and activity</li> <li>Web filtering and blocking</li> <li>Restrictions on cloud computing</li> <li>News aggregation fees</li> <li>Restrictions on online advertising</li> </ul>	<ul style="list-style-type: none"> <li>Filtering, blocking, and net neutrality</li> <li>Impeding access to online services</li> <li>Paid prioritisation of content</li> <li>Discretion on managing traffic during high network congestion</li> </ul>
<b>Technical Trading Restrictions</b>			
<ul style="list-style-type: none"> <li>Intermediary liabilities (lack of safe harbour for intermediary liability, notice, and takedown requirement)</li> <li>Standards (encryption, product safety certification, product screening, and testing requirements)</li> <li>Data policies (restrictions on cross-border data flows)</li> <li>Online transactions (barriers to fulfilment, discriminatory consumer protection, domain name (DNS) registration, online sales)</li> </ul>	<ul style="list-style-type: none"> <li>Restrictions on payment methods, online payment licensing, etc.</li> <li>Burdensome practices on electronic signatures, cybersecurity, and unsolicited mail</li> </ul>	<ul style="list-style-type: none"> <li>Electronic authentication and signatures</li> <li>Internet domain names</li> <li>Digital products</li> <li>Electronic payment platforms</li> <li>Other discriminatory practices</li> </ul>	<ul style="list-style-type: none"> <li>National standards and burdensome conformity assessment (local registration and testing requirements)</li> </ul>

Table 2: continued

ECIPE	Business Europe	USTR	CRS
<b>Technology Barriers</b>			
<ul style="list-style-type: none"> <li>Requirement to surrender patents, source codes, trade secrets, technology mandate</li> </ul>	<ul style="list-style-type: none"> <li>Requirements to deposit commercial source code and/or encryption keys to enter the market</li> <li>Cyber standards: insufficient protection and discrepancy with international practices</li> </ul>	<ul style="list-style-type: none"> <li>Requirements to meet onerous security standards</li> <li>Requirements to disclose encryption algorithms or proprietary source code</li> </ul>	<ul style="list-style-type: none"> <li>Cybersecurity risks (excessive encryption, access to encrypted data)</li> </ul>
<b>Data Localisation Requirements</b>			
<ul style="list-style-type: none"> <li>Data policies regarding privacy, etc., which require storage on local servers</li> <li>Local content requirements for commercial markets</li> </ul>	<ul style="list-style-type: none"> <li>Local data and server requirements on companies and services</li> </ul>	<ul style="list-style-type: none"> <li>Unnecessary requirements to store data within a particular jurisdiction or locate computing facilities locally</li> <li>Outright bans on cross-border data flows</li> </ul>	<ul style="list-style-type: none"> <li>Local content requirements (hardware or software) as a condition to manufacturing</li> <li>Requirements to build local server infrastructure</li> <li>Requirements to transfer technology or IP to a local partner company</li> </ul>
<b>IP Rights</b>			
<ul style="list-style-type: none"> <li>IP rights infringement (copyright, patent, trade secrets)</li> </ul>	<ul style="list-style-type: none"> <li>Insufficient copyright, patent, and trade secrets protection</li> </ul>		<ul style="list-style-type: none"> <li>IP rights infringement</li> <li>Foreign websites that facilitate IP rights infringement</li> <li>Software piracy</li> <li>Circumvention of technological protection</li> <li>Cybertheft of trade secrets</li> <li>Trademark infringement related to domain names</li> </ul>
<b>Establishment Restrictions</b>			
<ul style="list-style-type: none"> <li>Restrictions on board of directors and management</li> <li>Screening of investment and acquisition</li> <li>Competition policy</li> <li>Business mobility (quotas, labour market tests, limits of stay)</li> </ul>	<ul style="list-style-type: none"> <li>Industrial policies (e.g. import substitution, local content requirements)</li> <li>Forced public-private partnerships and joint ventures prerequisites to access local markets</li> </ul>		<ul style="list-style-type: none"> <li>Requirements to partner with local companies</li> </ul>
<b>Fiscal Restrictions</b>			
<ul style="list-style-type: none"> <li>Tariffs and trade defence (antidumping, anti-subsidy, and safeguards on information and communication technology (ICT) products)</li> <li>Taxation and subsidies (discriminatory tax regimes on digital goods and online services, taxation on data usage)</li> </ul>	<ul style="list-style-type: none"> <li>Customs duties on "electronic transmissions"</li> <li>Tariffs on ICT products</li> </ul>		<ul style="list-style-type: none"> <li>Tariffs on goods crucial to the digital sector, such as semiconductors, ICT equipment, electronic integrated circuits, etc., quotas on imports</li> </ul>
<b>SOEs and Public Procurement</b>			
<ul style="list-style-type: none"> <li>Public procurement (preferential purchase schemes covering digital products and services)</li> </ul>	<ul style="list-style-type: none"> <li>Limits on foreign participation in government tenders (telecommunications, software provision)</li> <li>Unfair SOE competition</li> </ul>		<ul style="list-style-type: none"> <li>Local content requirements as a condition to enter public procurement contracts</li> </ul>



The first four categories include new issues are specific to the digital realm:

- Frictions in the enabling environment are relevant primarily to Mode 1 trade, as they have the effect of compromising market access and conditions of competition for digital products. Since they are also highly relevant for the ability to capture data, they affect Mode 5 as well.
- Technical trading restrictions and technology barriers are relevant to Modes 1-4, as they affect the digital intermediation of transactions and can act as technical barriers to trade. The former have a “horizontal” characteristic, while the latter appear to be more specific to individual companies and proprietary technology.
- Data localisation requirements, as a frictional cost issue, affect Modes 1-4; as the basis for industrial policy in the AI age, these are fundamental to Mode 5.

The second four categories of frictions are well known from analogues in the physical realm (notably, they are all missing from the more tightly focused USTR list).

- IP rights are cross-cutting issues across all modes.
- Establishment and fiscal restrictions primarily affect Modes 1-4, as they impact on commercial transactions.
- SOE and procurement issues are likely to be fundamental issues to Mode 5, since access to data is premised on access to projects and customers.

In the latter regard, we are likely to see commercial approaches in the physical realm stood on their head: where companies formerly made capital investments in order to capture projects and customers, in the digital realm they are likely to bid low on projects to gain access to data for its capital

value. The announcement by the Chinese firm Baidu that it would give away its software for self-driving cars in exchange for the data generated (Feng and Yang 2017) is an extreme form of this inversion. The fight for procurement opportunities in the IoT world is likely to be intense.

## 5. United States, European Union, and China: Digital Divides and Rift Valleys

Circa 1980, when technological conditions were steepening economies of scale and increasing the scope for product differentiation based on quality, the potential for capture of international rents implicit in these conditions gave rise to trade wars in sectors like dynamic random access memory (DRAM) chips and aerospace. The main players were the United States, Japan, and Europe.

The digital transformation features these effects on steroids: economies of scale in the digital realm are extreme as the marginal costs of serving additional customers fall to effectively zero and quality advantages can lead to near total market dominance. The conditions are conducive to strategic trade rivalry and it has again emerged. This time around, the United States and Europe are joined in the main ring by China.

Each is playing the hand it has been dealt. The United States and Europe share a broadly similar vision about the organisation of markets, but the United States has a large first mover advantage and naturally seeks maximum openness to exploit the benefits and lock in the competitive advantage of US technological giants in digital trade. For Europe, having lost the lead to the United States notwithstanding its DSM strategy, the cost-benefit analysis leads to an emphasis on minimising the adjustment costs and risks of the digital transformation. It becomes the regulatory champion. China, while playing catch-up, has a numbers advantage and is exploiting that

to accelerate its progress up the learning curve. For data analytics, numbers are the I Ching and China's natural incentive is to restrict access to its own data.

The European Union and the United States are aligned on ICT issues in terms of basic principles. These are summarised in "European Union-United States Trade Principles for Information and Communication Technology Services" (European Commission 2011). Among the 10 principles, it is important to note the following:

- *Open networks, network access, and use* Governments should not restrict the ability of suppliers to supply services over the internet on a cross-border and technologically neutral basis.
- *Cross-border information flows* Governments should not prevent service suppliers of other countries or customers of those suppliers from electronically transferring information internally or across borders.
- *Local infrastructure* Governments should not require ICT service suppliers to use local infrastructure or establish a local presence as a condition of supplying services. This is an area of potential conflict given the very fragmented nature of Europe's ICT markets.
- *Authorisations and licences* Governments should authorise the provision of competitive telecommunications services. The meaning of "competitive" is subject to domestic regulations in each party.

However, there are sharp differences on the interpretation of those general provisions.

China does not share a commitment to open digital borders, instead claiming sovereignty over its cyberspace, which it defends behind its Great Firewall. While China has signed onto e-commerce provisions (e.g. in the Australia–China FTA), hard commitments do not go beyond those already made at the WTO and the commitment to base its laws

on the United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Commerce 1996. The document that speaks the most for China's position on rules regarding digital transactions is the Cybersecurity Law, which came into effect on 1 June 2017. The 79 articles of the law essentially make three major statements:

- physical data must be stored in Mainland China;
- there are mandatory security inspections of equipment prior to installation; and
- there are mandatory law enforcement assistance and data retention regulations.

China's strategy has succeeded—it is no North Korea of the digital economy. Rather, it has created a rapidly growing and technologically sophisticated "parallel universe" (Rauhala 2016) of domestic firms operating in the same space as the familiar Western companies. Some are world-class market leaders: Alibaba, Baidu, and Tencent's WeChat (Lawless 2017). China's AI ambitions are high and the data density that feeds AI learning in China is unparalleled in the world—its data generation today along numerous dimensions is as eye-popping as was its growth in goods trade post-WTO accession in the 2000s (Lee 2017).

Against that background, we comment on five high-profile issues to bring out the reality of digital divides—indeed of digital rift valleys.

## 5.1. Data Localisation and Privacy

A fundamental difference between the US and EU approaches is in dealing with the tension between prohibitions on data localisation and concerns about privacy.

The US approach, as embodied in the Trans-Pacific Partnership text, obligates parties to allow cross-border data flows and does not provide for strong privacy protection. As Geist (2016) notes:

Rather than setting the TPP privacy bar at having a national privacy law based on the OECD principles, the agreement weakens the shift toward a minimum standard of privacy protection. ... The footnote<sup>3</sup> effectively means that the TPP's privacy requirements can be met without the need for any privacy law at all. Enforcing voluntary undertakings isn't a privacy law, it's an anti-fraud approach that requires companies to be truthful about their privacy promises. If the law does not feature specific requirements for the consent, use, and disclosure of personal information, it isn't a privacy law. The TPP weakens global privacy protections by failing to establish a minimum privacy law standard and then makes matters worse by limiting the ability for member countries to establish some additional safeguards.

The CETA, meanwhile, is silent on data localisation and emphasises privacy.

While both parties are formally committed to protecting personal data and consumers' privacy, the classification and approach to safeguarding these rights are very different. In the United States, for example, there is no federal legislation regulating the collection and use of personal data. Instead, the system is comprised of diverse state regulations, industry "best practices," and various private standards. In the EU, on the other hand, there are currently relatively clear guidelines for the member states on the protection and use of personal information. In addition, the revised General Data Protection Regulation is to be implemented in 2018.

Until 2014, the Safe Harbor Agreement provided the framework for legal transfer of commercial data

between the European Union and the United States. However, the concerns about data protection in the wake of the 2014 Snowden leaks led the European Court of Justice to repeal the agreement. Instead, a new agreement, the Privacy Shield, came into force to replace the Safe Harbor. Privacy Shield imposes stricter obligations on US companies to protect the personal data of European citizens. However, various stakeholders and interest groups are critical about the oversight mechanism for privacy violations, as well as access and use of personal data (Hamilton 2017). The European Commission (2017), in its first annual review of the functioning of the Shield, determined that it "continues to ensure an adequate level of data protection. However, there is room for improvement." However, policy commentary suggests that without fundamental reform, the Court of Justice of the European Union is likely to strike down the Privacy Shield.

While the digital divide between the European Union and the United States has so far remained bridgeable, there is a rift valley between the approach of these two jurisdictions and China. China does not commit to the free flow of data across borders, on various grounds, including political. As regards privacy, the United States and China are engaged in ongoing discussions in the Asia-Pacific Economic Cooperation forum about cross-border privacy rules. Under these rules, a participating economy appoints agents that certify companies with compliant data privacy policies. However, the United States and China appear to be on opposite sides in the understanding of what are compliant data privacy policies.

## 5.2. Net Neutrality and Competition

Another potential rift that is emerging is on net neutrality. In the European Union, net neutrality is official doctrine, but the US Federal Communications Commission has moved to eliminate it in the United

<sup>3</sup> TPP Article 14.8.2, note 6: "For greater certainty, a Party may comply with the obligation in this paragraph by adopting or maintaining measures such as a comprehensive privacy, personal information or personal data protection laws, sector-specific laws covering privacy, or laws that provide for the enforcement of voluntary undertakings by enterprises relating to privacy."

States.<sup>4</sup> In reality, the internet has not been neutral in either jurisdiction; for example, consider such practices as “zero rating” particular products (which gives them preferential access to the web)<sup>5</sup> and “peering” (which allows major clients to bypass traffic by having dedicated lanes—see Annex 1 for a discussion). Nonetheless, a formal departure from net neutrality would create a significant divide between the European Union and the United States on policy. The small open economy perspective (Canada) is aligned with the former.

Closely linked to the net neutrality issue is competition policy for the web and online services. The major internet platforms like Google and Facebook have attained a status not unlike that of basic utilities, such as telecoms providers (McCabe 2017). And, indeed, the distinction between internet platform providers and telecoms companies are being blurred, as the former start to build their own dedicated telecommunications infrastructure (see Annex 1 for a discussion). Yet the two are regulated quite differently from a competition perspective, with telecoms providers being subject to more stringent regulation concerning not giving preferential access to their “pipes” to favoured customers.

The European Union’s lawsuit against Google for breach of EU antitrust laws for favouring its own products over those of its competitors (Finley 2017) comes at the same issue from the internet provider

side. Notably, the United States had considered similar actions, but declined to pursue them (Mullins, Winkler and Kendall 2015).

Accordingly, while the European Union and the United States were close to being on the same page a few years ago, they have been moving apart.

### **5.3. Contingent Work Policy Differences Loom Larger with the Expansion of the Gig Economy**

The evolution of the so-called contingent jobs in the “collaborative,” “on-demand,” or “gig” economy enabled by the digital transformation is not only changing the nature of work arrangements by providing flexible employment opportunities to many who would not be able to access traditional full-time corporate jobs, but also creating a gap in access to social benefits like unemployment insurance, health benefits, and so forth, enabling employers to avoid social security and tax obligations.

EU labour markets have stronger levels of regulation in terms of employment contracts, working hours, minimum wage, notice of termination, paid holidays, unemployment benefits, pension benefits, healthcare, and so forth, compared to those in the United States. Electronic platforms, such as Amazon’s Mechanical Turk, TaskRabbit, and others, and firms in the “sharing” economy, such as Uber and AirBnB, consider themselves merely platform providers, whereas the employee-users of those platforms are, according to them, “self-employed.” Within Europe, the strength of social safety nets for the self-employed, an important job category for the digital age, varies across EU member states: for example, unemployment insurance for the self-employed is compulsory in 12 member states, voluntary in six others, and not available in the remaining (Brunsden 2017). Accordingly, consideration is being given to adapting labour market regulation to ensure access to labour market protections for workers in this new environment. In the United States, meanwhile, this is not the case. Indeed, at the federal level, there is a

<sup>4</sup> Tim Wu, who first coined the term “net neutrality,” argues that the Commission’s abandonment of formal net neutrality might not survive court review on grounds that government agencies are not at liberty to reverse long-standing and widely accepted practice at a whim; such changes must be founded on a change in factual circumstances. See Wu (2017).

<sup>5</sup> This issue has arisen in the European Union where Swedish telecom provider Telia offered unlimited access to mobile phone subscribers for particular apps, even when their data plans had maxed out. The case is before the courts as a possible violation of the European Union’s net neutrality laws. See Alderman and Tsang (2017).

bill to implement federal “right to work” legislation,<sup>6</sup> which facilitates the shift of jobs into the contingent category.

With the likely acceleration of the migration of work into the contingent category due to the expanding reach of the digital transformation, the divergent perspectives on labour market regulation in the European Union and the United States point to a widening of the gap between them. We can anticipate frictions over social insurance contributions, with implications for the future regulation of Mode 4 digital trade as we define it from the perspective of “social dumping.”

## 5.4. Censorship and Digital Content

Constitutional protection for freedom of speech in the United States under the First Amendment is unequivocal: “Congress shall make no law ... abridging the freedom of speech, or of the press.” Hate speech can only be banned in the United States if it is intended to incite imminent violence and is deemed likely to do so.

In the European Union, individual country regulations criminalise certain types of speech and this is being extended to the internet. Thus, Germany’s “Network Enforcement Law,” which came into force on 1 October 2017, compels social media companies to conform to German federal law governing the freedom of speech. The law makes social media platforms with more than two million registered users in Germany liable for fines of up to 50 million euros for leaving posts up for more than 24 hours (in clear-cut cases) that feature unlawful content under Germany’s Criminal Code, which bans *inter alia* incitement to hatred, incitement to crime, and the spread of symbols belonging to unconstitutional groups.

While the law is controversial with Germany’s internet rights community, this issue is unlikely to go quietly into the good night given the ramifications of social media involvement in political processes, as suggested by media reports on the German election:

Facebook played a role in delivering to the far-right Alternative for Germany party the best performance of a far-right nationalist party since the Third Reich. Harris Media, the Austin-based political consultancy that the AfD hired to increase its social-media presence, took advice from Facebook employees in Berlin before the election and developed digital ads targeting Germans whose social-media usage made them seem sympathetic to the AfD’s cause. (Kinstler 2017)

## 5.5. Intellectual Property Rights

IP rights protection is an area where the European Union and the United States share significant common interests. However, there are also long-standing differences on certain aspects of IP rights, the importance of which is magnified due to the new technologies. For example, copyright law struggles to address internet piracy and inadequate compensation for digital content providers. The European Union is trying to implement a new directive on copyright in the DSM, requiring service providers to monitor, filter, and block uploaded content that violates copyrights, while US legislation is based on fair-use exceptions for copyright. Other issues related to IP rights, such as geographical indications, are still on the agenda, with added emphasis since the development of digital trade. This is a rapidly evolving area and convergence is not assured.

<sup>6</sup> H.R.785—National Right-to-Work Act, 115th Congress (2017-2018), sponsored by Rep. King, Steve [R-IA-4] (Introduced 02/01/2017).

## 6. Towards a Forward-Looking Agenda

To facilitate the analysis of the role that trade agreements play or might play, this paper suggests a classification of the modes in which trade is conducted as it progressively shifts into the digital or digitally facilitated realm. We also identify the areas where resistance has been encountered, categorise the nature of the measures that have been introduced, and highlight some main differences in approaches taken by the major digital economy players in framing regulations for digital and digitally enabled trade in the RTAs in which they are engaged.

Given the underlying economics of digital and digitally enabled trade and the circumstances of the three major players, there is no obvious intersection of interests on which they could easily converge. Differences in structure, content, and emphasis of the trade agreements into which they have entered can thus be seen as a natural outcome of policies aligning with incentives.

The small open economies find themselves most closely aligned with the European Union in the sense that their defensive interests (dealing with the fallout from digital disruption) outweigh their offensive interests (the capture of market share in the emerging KBE/DDE). The major emerging markets will have a menu of strategic options to choose from and the choice will depend upon digital ambitions. The BRICS (Brazil, Russia, India, China, and South Africa) have the option of following China's lead given their large populations. For the smaller developing economies, especially in Africa, the expedient tactic is to capture consumer benefits of access to the "free" content on the internet and to use the digital economy framework to participate in global commerce as best they can given the realities of the digital divide.

This broad-brush analysis points to the likelihood of a drift towards balkanisation of the digital economy at least in the near term, with potential for digital

trade conflicts centred on regulations (European Union versus United States) and on market access (European Union and the United States versus China and perhaps other BRICS).

It also points to the difficulty of forging consensus for a WTO multilateral framework for e-commerce. The WTO has been on the sidelines on e-commerce, with its work programme in this area established in 1998 delivering no results, other than maintaining the moratorium on duties on electronic transmissions (a not inconsiderable contribution in preserving trade peace for two decades of digital development!), leaving all the action to the RTAs. This did not change with the outcome of the WTO's 11th Ministerial Conference in Buenos Aires in December 2017. Although some eight proposals on e-commerce were circulated and an attempt was made to revitalise the work programme, a blocking coalition led by India leaves the WTO formally on the sidelines with a "status quo" outcome.

It would seem that we need to have the war to see the shape of a WTO-brokered peace; with the expiry of the WTO moratorium on duties on electronic transmission, that is more likely to flare.

### A role for the WTO

On the reasonable premise that an investment in dialogue might get us there sooner, with lesser economic costs, the group of interested small open economies should mobilise now to talk. Taking a page from the "Really Good Friends of Services," consideration should be given to forming an analogue "Really Good Friends of Digital Trade" to energise what has by all reports been a lacklustre formal dialogue in the WTO to date. The basis for such a coalition exists in the efforts made by a group of countries to mobilise support for a revitalised WTO work programme.

A public-private dialogue involving the WTO, the Electronic World Trading Platform, and the World Economic Forum for "enabling e-commerce," which was launched in Buenos Aires, provides another

point of engagement, but this is an additional degree further removed from the launch of negotiations than a WTO members' dialogue.

**The RTA-driven evolution of e-commerce rules has likely reached its limits**

With the WTO Ministerial not having seized the reins on e-commerce, the action will continue to unfold in RTAs. However, the momentum here is likely to peter out if and when the major RTAs under negotiation take effect. Two agreements are likely to set the boundaries for RTAs: the Comprehensive Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP), which includes both China and India.

The CPTPP will feature a US-centric model for e-commerce without the United States directly participating. Accordingly, it is a good representative of how far smaller open economies and developing economies will be willing to go in making treaty commitments in this area, even without direct pressure from the three majors.

The RCEP, meanwhile, will feature a minimalist e-commerce regime, with technical facilitation issues covered but the larger issues of market access, privacy, and data flows skirted.

With the Transatlantic Trade and Investment Partnership stalled for the foreseeable future, a US role in shaping the international regime will come through either bilaterals or a renegotiated North American Free Trade Agreement (NAFTA). In either

case, the e-commerce chapter would incorporate the original Obama-era TPP language, but, in light of the signals from the NAFTA talks, would tighten the scope for derogations from TPP commitments to address "legitimate" right-to-regulate issues in such areas as privacy.

**Which leaves the European Union best placed to lead**

This leaves the European Union as the region that is best able to progressively refine the balance of concerns between open digital and digitally enabled trading regimes and the plethora of regulatory concerns that are bubbling to the surface. The EU features a rich regulatory "sandbox" with its DSM and Telecoms Single Market initiatives, experimentation at the member state level (in particular by leading edge examples such as the e-Estonia initiative), and legal decisions handed down by the Court of Justice of the European Union in response to challenges to European Commission policies. The experience the EU gains will likely chart the way around the rocks and shoals posed by the difficult issues surrounding information flows, such as privacy or the security of data, as well as reconciling industrial policy flexibility with an open trading framework.

In the meantime, EU trade agreements, such as the FTA with Japan, are likely to fall into the space between the CPTPP and RCEP in terms of having stronger commitments than RCEP, but not including hard provisions on data flows, as pointed to by the square-bracketed language around data flows in the EU-Japan FTA.

## Annex 1: Review of Background Issues

### Trade governance meets internet governance

As trade shifts into the digital realm, trade norms, rules, and procedures have to be reconciled with the norms, rules, and procedures developed within the multi-stakeholder framework for internet governance (Box A1). In theory, this should not be problematic: the underlying principles on which the internet was developed—open, minimalist and neutral, with access provided to all devices and apps—is self-evidently aligned with the key WTO principles of non-discrimination and most-favoured-nation treatment. This is one reason why trade has taken to the digital realm like a duck to water.

### Box A1.

An overview of internet governance

Internet governance is a deep and rich field of activity. It has evolved in a bottom-up fashion without an overarching framework or a central governing body (Aaronson 2016). Key institutions involved in developing the soft infrastructure for digital commerce include the following:

- the International Telecoms Union, which among many other things addresses international standards to aid the healthy development of the Information Society;
- the Internet Corporation for Assigned Names and Numbers (ICANN), which maintains databases and administers procedures related to the namespaces of the internet, ensuring the network's stable and secure operation;
- technical development is advanced by a multi-stakeholder framework, which features the Internet Society, the Internet Architecture Board, the Internet Engineering Task Force, and the World Wide Web Consortium.
- UNCITRAL, which provides model law and addresses legal issues related to identity management and trust services, as well as contractual aspects of cloud computing; and
- the Hague Conference on Private International Law, which has addressed private international law norms (including conflict of laws, procedure, and judicial cooperation) related to e-commerce and internet transactions.

Policy discussions to provide norm-setting guidance take place in many intergovernmental organisations, including the United Nations through its Internet Governance Forum, the OECD, the G7, the G20, Asia-Pacific Economic Cooperation, and the World Bank.

Non-governmental organisations, such as the Internet and Jurisdiction Policy Network and the Electronic Frontier Foundation, provide policy analysis and weigh in on various issues, the former with a view to facilitate intergovernmental cooperation, and the latter often in vocal opposition to governmental initiatives. Initiatives that have received strong push-back from NGOs include the proposed US move away from net neutrality; proposed legislation, such as the US Stop Online Piracy Act, Protect IP Act, and Cyber Intelligence Sharing and Protection Act; and international treaties, such as the Anti Counterfeiting Trade Agreement and TPP.



RTAs contribute to the governance of digital commerce through the reaffirmation and international promulgation of established technical practices (e.g. standards for electronic authentication and acceptance of digital documents) with hard law treaty commitments and by addressing border-related issues.

While the internet inherently transcends national borders, cyberspace is not and never really has been a borderless world (Goldsmith and Wu 2006). The assertion of preferences and pursuit of commercial interests by nation states has resulted in at least partial balkanisation of the internet—the so-called “splinternet” (Malcomson 2016; Alba 2017). Effective control is asserted by governments within national spaces through hard border barriers, such as China’s Great Firewall; formal regulation within an open internet environment, such as the privacy and net neutrality laws under the European Union’s DSM and Telecoms Single Market initiatives and the US Electronic Communications Privacy Act; and through less visible “shadow regulation” (Stoltz 2016; Economist 2016) imposed by private companies at the insistence of government—the primary US model.

Superstar firms with discretionary investment budgets that exceed the GDP of many smaller developing economies have also compromised the nominal neutrality of the internet by establishing technical advantages through “peering” arrangements with internet service providers and even by building their own proprietary backbone infrastructure—for example, Microsoft, Facebook, and the telecoms infrastructure company Telxius, a subsidiary of global communications giant Telefónica, have laid a transatlantic fibre-optic cable between Virginia Beach, Virginia and Bilbao, Spain; and Google has invested in cables that run from the United States to South America, as well as to Japan and other countries in Asia (Ong 2017). The blurring of distinctions between telecoms and digital services has potentially profound implications for competition and regulation. As noted by Kariyawasam (2015),

Regulation in the communications sector has generally favoured separating content from infrastructure. Nevertheless, when it comes to delivering digital products (whether goods and/or services) over a network, the very nature of the delivery method requires a holistic view to traditionally separate goods and services regulation, content, and infrastructure regulation.

As global digital participation expands, the governance of the system is evolving away from its original US-centric framework.<sup>i</sup> The shape of the future framework is an open issue (see, e.g., Global Commission on Internet Governance, 2016, which proposes a new “Social Compact” for an open internet). The two main poles of attraction appear to be an evolved version of the present privatised multi-stakeholder framework (which conforms with US

---

<sup>i</sup> A milestone in this transition was the formal transfer to the multi-stakeholder community on 1 October 2016 of stewardship of the Internet Assigned Numbers Authority function, which ICANN had managed on contract from the National Telecommunications and Information Administration of the US Department of Commerce. US stewardship of this function had been a bone of contention for many countries.

preferences; Savage and McConnell 2015) and a multilateral governance framework, which is favoured by some developing countries. Developing countries are increasingly asserting themselves, but a broadly shared vision has not been formed (Subramanian 2013). RTAs, such as the TPP, aim to influence the facts on the ground in order to tilt the evolution in the favoured direction of the RTA sponsor—hence the controversies that RTA interventions in digital regulation raise with the internet and technology communities.

Commenting on the entry of trade agreements into this domain, Aaronson (2016) observes,

the internet is governed in a more ad hoc, bottom-up and transparent manner [than trade negotiations] ... Many internet activists would not take kindly to such a dramatic change to internet governance. Moreover, many internet issues that involve information flows, such as privacy or the security of data, are not market-access issues. But they are regulatory issues.

An important issue for digital trade policy at the WTO/RTA level is thus to clarify its role relative to the massive body of work on the basic infrastructure for transactions in the digital economy already undertaken in various specialised fora.

### **The economics of the knowledge-based economy / data-driven economy**

The theoretical framework for the KBE/DDE that is being spawned by the digital transformation is provided by models of endogenous growth. These models emphasise the role of increasing returns to scale, development of new technologies, and human capital as drivers of economic growth (see Lucas 1998; Romer 1990; Aghion and Howitt 1992). Also of particular relevance is the economics of “superstars.” This theory predicts extreme skewing of market share and rent capture by the suppliers with a quality advantage if the technological environment allows the marginal cost of serving additional customers to fall to very low levels (Rosen 1981).

While these theories were inspired by observation of the KBE in its early days, today’s KBE/DDE broadens the applicability of these models and intensifies their effects. The economies of scale in digital industries are potentially extreme as firms face a combination of high upfront fixed costs of participation and effectively zero marginal costs of serving additional customers. The shift of innovation into the digital realm also has enabled the “industrialisation of learning” (Ciuriak 2017b) through the application of AI to data. Privileged access to data paves the way for quality advantages. Together with greater ability to exploit quality advantages because of improved market information enabled by the internet, these effects create “winner take most” economics, which gives rise to superstar firms (Autor et al. 2017). Supporting factors contributing to the observed rise of superstar firms are near-frictionless commerce enabled by the internet and globalisation, which enables more efficient firms to capture greater market share (Van Reenan and Patterson 2017); and increased protection for IP, which creates stumbling blocks for potential competitors (Ciuriak and Curtis 2015).

Statistics on industrial concentration confirm the expectations based on these theoretical considerations: namely, growing concentration across a broad swathe of industries, with most of the concentration explained by the shift of market share to superstar firms (Autor et al. 2017)

Circa 1980, when technological conditions were steepening economies of scale and increasing the scope for product differentiation based on quality, new theoretical contributions captured the implications for trade policy: these included “new trade theory” (Krugman 1979; 1980), and the economic case for strategic trade policy (Brander and Spencer 1985). At that time, the potential for capture of international rents implicit in these conditions gave rise to trade wars in sectors like DRAM chips and aerospace. The main players were the United States, Japan, and Europe. The emergence of similar conditions has again induced strategic trade rivalry. This time around, the United States and Europe are joined in the main ring by China.

Bottom line: the economics of the KBE/DDE leads to strategic trade rivalry. Trade peace is not to be expected.

### **Inclusive trade in the knowledge-based economy / data-driven economy**

A major contemporary theme in trade policy is inclusive trade. This has been discussed in the WTO, the G20, and the World Economic Forum and is echoed in the European Union’s concept of trade sustainability and Canada’s progressive trade agenda. The latter was recently enshrined in the change of name of the TPP to the CPTPP. As articulated by Azevêdo (2017), inclusive trade means “building a system where the benefits are shared more widely [by] entrepreneurs, SMEs, women, and marginalised groups in all economies.” This raises the question of the implications of the KBE/DDE for inclusive trade and by extension inclusive growth.

Generally, the literature suggests that participation in the digital economy is positive for trade and growth across countries, but is not necessarily positive for inclusive growth within countries, and developing countries have not closed the digital divide. The World Bank Group, in its major study on the implications of the digital economy for inclusive growth, observes:

Digital technologies have spread rapidly in much of the world. Digital dividends—the broader development benefits from using these technologies—have lagged behind. In many instances digital technologies have boosted growth, expanded opportunities, and improved service delivery. Yet their aggregate impact has fallen short and is unevenly distributed. (2016, 2)

Numerous studies attest to the positive connections between digital economy participation and economic growth. Caselli and Coleman (2001), using OECD country data, find similar evidence that computer adoption is associated with higher levels of human capital and with manufacturing trade openness. Kraemer, Gibbs and Dedrick (2005) find that globalisation and e-commerce lead to greater efficiency and firm

performance. Jorgenson, Ho, and Stiroh (2008), van Ark, O'Mahony, and Timmer (2008), and Oliner, Sichel, and Stiroh (2007) show that the type of capital related to internet and communication technologies has a positive impact on economic growth, total factor productivity, and labour productivity. Using instrumental variables, Czernich et al. (2011) estimate that a 10 percentage point increase in broadband penetration raises annual per capita growth by 0.9–1.5 percentage points. Choi and Hoon Yi (2009) find that internet use (the ratio of internet users to total population) has a positive and significant impact on economic growth. To account for potential endogeneity in a gravity model setting, Clarke and Wallsten (2006) use countries' regulation of data services as an instrument and find a positive relation between export performance or volumes of trade and internet use. Vemuri and Siddiqi (2009), by employing various panel data methods, find that the effects of ICT infrastructure on internet availability for commercial transactions are positive and significant. In addition, some studies focus on firm-level export performance; for example, Clarke (2008) analyses the data for low- and middle-income countries and finds that enterprises with internet connections have more exports as a share of their total sales, on average.

The spread of the internet and improved access through smartphones have made available substantial private benefits in the form of access to information, free digital products, and social connectedness both locally and to global communities with similar interests. At the same time, an important strand of the literature supports the argument that participation in the digital economy skews returns, in part by favouring skilled workers over unskilled. Akerman, Gaarder, and Magne (2015) use an exogenous variation produced by a Norwegian public programme and argue that broadband internet improves labour market outcomes and the productivity of skilled workers, though it worsens labour market indicators for unskilled workers. Atasoy (2013), using models with county and time fixed effects, shows that gaining access to broadband services in a given county in the United States is associated, on average, with a 1.8 percentage point increase in the employment rate. Michaels, Natraj, and Van Reenen (2014) employ a dataset for the United States, Japan, and nine European countries from 1980 to 2004 and find that industries with faster ICT growth shifted their demand from middle-educated workers to highly educated workers, consistent with the ICT-based polarisation hypothesis. The World Bank Group summarises: "Labor markets have become more polarized and inequality is rising—particularly in the wealthier countries, but increasingly in developing countries" (2016, 2).

Finally, as regards the digital divide, it is apparent not only between the developed and developing countries, but also within developed countries (see CIRA 2014 for data on Canada; the Council of Economic Advisers 2015 for data on the United States, and European Commission 2015, for data on Europe). This is consistent with the skewing that the digital economy drives and suggests efforts at inclusive growth will become harder the more pervasive the digital transformation becomes, barring substantial improvements in connectedness for lower-income groups. By the same token, socio-economic pressures are likely to make holding onto an open KBE/DDE regime more, not less, difficult, even given a general preference for openness.

## Prospects for an international digital economy regime

The design challenges of developing an internationally agreed framework for digital trade has been addressed by a number of researchers. Meltzer (2015) argues that, for digital trade to continue to grow and benefit all countries, trust has to be established by agreeing on a set of international trade rules. In particular, he identifies existing rules that require a re-emphasis of commitments and determines new challenges that require new rules. The latter, he argues, will not necessarily present fundamentally novel challenges for trade law and could be based on commitments and the right of members to pursue legitimate policy goals. However, Chander (2009) argues that there exist various unsettled legal issues at stake in cyber-trade, suggesting that agreeing on new rules requires striking a balance between removing barriers to digital trade and protecting states' capacity to regulate themselves, that is, "importing of services should not require us to import law as well."

International convergence and institutional settings are increasingly becoming a focus of interest for policymakers. OECD (2016a) looks at trends in the convergence of digital networks and finds that this process is steadily deepening as technology evolves and, even more so, as activity shifts online. It outlines major trends in this convergence, as well as challenges and opportunities for policymakers, while providing policy recommendations. Analysing the institutional set-up for the development of digital trade, Porges and Enders (2016) focus on how trade policy institutions can mobilise support for the development of the digital economy. They discuss the roles of the WTO, RTAs (specifically, the TPP), and plurilateral agreements (particularly, the Trade in Services Agreement) in the support of digital trade growth.

The substance of an international regime for the digital economy has been explored in a number of research papers. For instance, Chander and Le (2014) analyse the effects of localisation barriers on the global internet, describing different localisation policies used by various countries around the world, and suggest that such policies both threaten new advances in information technology and undermine the social and economic rights of consumers and businesses.

UNCTAD (2016) focuses on data protection regulations and argues that a certain set of principles should be at the core of achieving more compatible and harmonious rules across different countries. The report argues that while there is no single agreed model for a data protection law, there is a general understanding in the community that such a framework has to be developed.

The OECD has developed a number of pioneering reports related to the regulation of certain aspects of the digital economy. OECD (2014b) looks at cloud computing and its impact on the social and economic environment and discusses policy issues raised by cloud computing and the role of various stakeholders in addressing these issues. OECD (2016b) investigates the emergence of new forms of work in the digital economy, such as online platforms; discusses how these platforms affect market organisation; and outlines related opportunities and challenges for participants in such markets.

OECD (2016c) explores issues related to the Internet of Things and analyses the adequate policy and regulatory frameworks in telecommunications, security, privacy, and consumer policy.

### **Developing an analytical framework**

Defining clear-cut terminology, measurement indicators, and methodological approaches to digital trade has been the focus of international organisations and research institutions.

An attempt to identify a sound measurement system for digital economy indicators is provided in OECD (2014c), which selects indicators traditionally used to monitor the information society and complements them with experimental indicators. The resulting set of measurements provides insight for policymakers. Building on existing OECD research, López González and Jouanjean (2017) attempt a comprehensive overview of definitions, measurements, and policy implications of digital trade and propose a tentative typology of digital trade that can be used to unpack transactions. They argue that this will help in understanding and identifying issues and better reflecting digital trade in trade statistics.

Lund and Manyika (2016) analyse three ways in which the transformation of digital technology is taking place: through cross-border flows of purely digital goods; by using “digital wrappers” to enable the physical flow of goods; and through the creation of online platforms for production, exchange, and consumption.

Similarly, UNESCAP (2016) looks at ways to proceed with the qualitative and quantitative analysis of digital trade. It argues that without a unified definition, proper conceptual framework, and systematic data collection, policy design will be left with important questions. It further suggests an analytical framework for policy issue discussions by identifying four areas of consideration: digital-infrastructure goods, digital-infrastructure services, digitised products, and electronically enabled services. Likewise, in order to move forward with measurement, UNCTAD (2015) categorises e-commerce based on the electronic relationships between governments (government to government, G2G), enterprises (business to business, B2B), and consumers (business to consumer, B2C, and consumer to consumer, C2C).

Besides defining and structuring, the research in digital trade and e-commerce identifies and categorises trade barriers. In many cases, unlike traditional tariff and non-tariff barriers, digital trade measures require thorough investigation from qualitative and quantitative perspectives. The pioneering research in this area was carried out by the OECD (through its Services Trade Restrictiveness Index research) and the European Centre for International Political Economy. The latter is currently collecting a database of digital trade estimates (DTE), which now contains measures reported by 65 economies worldwide. The ECIPE project aims to develop a DTE index, indicating the trade restrictiveness of digital trade policies worldwide.

## Annex 2: RTA Design: TPP, CETA, and RCEP

While the European Union and United States seem to be aligned on broad principles regarding the regulation of digital commerce, the implementation in their respective RTAs is quite different. The US approach is exemplified in the TPP, which remains the template for the CPTPP and reflects the US position going forward.<sup>ii</sup> This agreement features strong commitments with prescriptive and legalistic text. By contrast, the limited set of rules outlined in the CETA reflects the cautious position of the European Union towards regulations in digital trade. In particular, there is no mention of removing any market access barriers in the agreement, since the European Union does not consider many of its measures in place (including national regulations) to be barriers to trade.

Box A2 provides an overview of these two leading approaches to regulation of digital commerce.

### Box A2.

The TPP and CETA compared

The TPP provides the most comprehensive set of rules for digital trade and electronic commerce in any RTA to date. It includes a separate chapter on e-commerce (Chapter 14), as well as some horizontal and sectoral regulations related to digital trade, such as IP rights (Chapter 18), technical barriers to trade (Chapter 8), investment (Chapter 9), cross-border trade in services (Chapter 10), and financial services (Chapter 11). Overall, the agreement is aimed at enhancing digital trade by removing a number of market access obstacles, ensuring free flows of data and “open internet” and removing policy measures related to technological and infrastructural development.

The most important TPP provisions in respect of digital trade address market access, innovation and technology, and consumer protection and data privacy.

On market access, the most prominent TPP provisions include the following:

- Prohibition of data localisation requirements: no member of the agreement can require businesses to use or locate computing and storage facilities on its territories (Article 14.13).
- Prohibition of customs duties on electronically transmitted content (i.e., ensuring free flow of music, videos, etc.)<sup>a</sup> (Article 14.3).
- Prohibition of restrictions to cross-border data flows (subject to safeguards<sup>b</sup>), including all the data used for business purposes and private data (Article 14.11).
- Prohibition of the requirements for source code disclosure or transfer as a condition for market access (Article 14.17).

<sup>ii</sup> For example, the United States International Trade Commission praises the TPP chapter on e-commerce, as follows: “TPP’s provisions bearing on digital trade and Internet-based commerce, areas in which the United States has strong competitive advantages, are more wide-ranging than in any previous US FTA. ... The e-commerce chapter ... serves as a template for future US and global trade agreements” (USITC 2016, 345–6).

## Box A2: continued

On technological development and innovation, the following are the cutting-edge requirements:

- Prohibition of requirements for technology transfer or access to proprietary information for products using cryptography (Article 14.17).
- Ensuring copyright protection through technical protection measures and rights management information, while providing safe harbours for internet service providers (Articles 18.68, 18.69, and 18.82).
- Clarification of IP rights enforcement rules to provide criminal penalties for trade secret cybertheft (Article 18.78).
- Cooperation on cybersecurity (Article 14.16).

On consumer protection and cooperation the following are the main measures:

- Requirement to have online consumer protection, anti-spam laws, and a legal framework on privacy (Article 14.14).
- Safeguards on cross-border electronic card payment services (Annex 11-B to Chapter 11).
- Cooperation between parties on e-commerce to assist small and medium-sized enterprises (SMEs) and on privacy and consumer protection (Article 14.8).
- Promotion of cooperation for international roaming charges (Article 13.6).

The annexes of the agreement lay out the non-conforming measures, whereby each country exempts certain sectors or horizontal measures from its obligations (e.g. Japan includes national security screening requirements for “telecommunications and internet based services”). Two major carve-outs from the application of TPP digital economy provisions are public procurement and financial services. The financial services text has some cross-border data flows measures, but does not prevent data localisation, a reflection of financial supervisory concerns about access to the books of their banks.

Compared to the TPP, the CETA provisions are very “light” from a policy perspective. Its e-commerce chapter (Chapter 16) is relatively short and includes the following measures:

- Prohibition of customs duties or other charges for digital content transmitted electronically between Canada and the EU (as in the TPP, such a requirement duplicates the WTO moratorium, but makes it permanent).
- Trust and confidence in electronic commerce; this subchapter effectively states that each party has a full right to maintain and adopt any laws, regulations, or administrative measures for the protection of users’ personal information.
- Establishment of the dialogue on electronic commerce: this measure ensures that the EU and Canada have a communication mechanism to discuss any issues relating to electronic commerce, such as recognition of online identities and electronic signatures, liability of suppliers towards the transmission, storage of information, etc.
- Agreement on the principles that should guide electronic commerce, which recognise e-commerce as a “social and economic development tool.”

<sup>a</sup> Currently, in the WTO, such measures are also sustained through the moratorium on customs duties on digital content.

<sup>b</sup> Exceptions relate to achieving legitimate public policy goals, such as protecting health, safety, and national security.



Table A1 provides a side-by-side comparison of TPP and CETA, and includes the corresponding ChAFTA (China–Australia Free Trade Agreement) provisions, since these likely signal the outcome of the RCEP. The table identifies the barriers the respective provisions address and highlights commonalities/differences with formatting.

**Table A1.**

Comparison of the provisions of electronic commerce chapters in TPP and CETA

Note: green = similar/almost identical language; **bold** = important differences in language; red = conceptual difference

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Scope and General Provisions/ Objective and Scope, General Provisions	Recognising economic growth and opportunities provided by electronic commerce.	Recognising that electronic commerce increases economic growth and trade opportunities.	Recognising the economic growth and opportunities provided by electronic commerce.	
	<b>Avoiding unnecessary barriers.</b>	<b>Confirming the applicability of WTO rules to electronic commerce.</b>	<b>Recognising the importance of avoiding barriers to [electronic commerce] use and development, and the applicability of relevant WTO rules.</b>	
		Recognising the potential of electronic commerce as a social and economic development tool ( <b>clarity, transparency, and predictability; interoperability, innovation, and competition</b> ; facilitating the use of e-commerce by SMEs).	Ensuring that bilateral trade through electronic commerce <b>is no more restricted</b> than other forms of trade.	
Customs Duties/ Customs Duties on Electronic Deliveries	No imposition of customs duties <b>on electronic transmissions, including content transmitted electronically.</b>	No imposition of customs duties, fees, or charges <b>on a delivery transmitted by electronic means.</b>	No imposition of customs duties <b>on electronic transmissions, consistent with WTO Work Programme.</b>	<b>ECIPE, Business Europe:</b> Fiscal restrictions: customs duties on “electronic transmissions,” tariffs on ICT products.
	Not precluding a party from imposing internal taxes, fees, or other charges on content transmitted electronically, provided it is consistent with the Agreement.	No preventing a party from imposing an internal tax or other internal charge on a delivery transmitted by electronic means, provided it is consistent with the Agreement.	Each Party reserves the right to <b>adjust its practice in accordance with any further WTO Ministerial Decisions</b> in relation to the Work Programme on Electronic Commerce.	

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Non-discriminatory Treatment of Digital Products	No according less favourable treatment to digital products created, produced, published, contracted for, commissioned, or first made available on commercial terms in the territory of another party (exceptions on IP, government subsidies, and broadcasting).			<b>Business Europe:</b> Partially addressing unfair competition from SOEs.
Domestic Electronic Transactions Framework	<p>Maintaining a legal framework governing electronic transactions consistent with the principles of UNCITRAL.</p> <p>Avoiding any unnecessary regulatory burden on electronic transactions.</p>		<p>Maintaining domestic legal frameworks governing electronic transactions based on the UNCITRAL Model Law on Electronic Commerce 1996 <b>and other relevant international standards.</b></p> <p>Minimising the regulatory burden on electronic commerce; and ensuring that regulatory frameworks support industry-led development of electronic commerce.</p>	<b>USTR:</b> Restrictions and discriminatory rules on online sales and transactions (bans on operation, restrictions on payment methods, online payment licensing, etc.).
Electronic Authentication and Electronic Signatures	<p><b>No denial of the legal validity of a signature</b> solely on the basis that the signature is in electronic form (with exceptions).</p> <p>Encouraging the use of interoperable electronic authentication.</p>	<p><b>Under Dialogue on Electronic Commerce, agreeing to maintain a dialogue</b> on the recognition of certificates of electronic signatures, the liability of intermediary service suppliers with respect to the transmission, or the storage of information.</p>	<p><b>Maintaining laws regulating electronic signatures</b> that permit to mutually determine the appropriate electronic signature and authentication methods; and to have the opportunity to <b>prove electronic authentication services comply</b> with the relevant legal requirements.</p> <p>Working towards the <b>mutual recognition</b> of digital certificates and electronic signatures.</p> <p>Encouraging the use of <b>digital certificates</b> in the business sector.</p>	<b>USTR:</b> Issues surrounding <b>electronic authentication and signatures, internet domain names, digital products, electronic payment platforms, and other discriminatory practices.</b>

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Online Consumer Protection	<p><b>Maintaining consumer protection laws</b> to proscribe fraudulent and deceptive commercial activities.</p>		<p>To the extent possible and in a manner it considers appropriate, <b>providing protection for consumers using electronic commerce</b> that is at least <b>equivalent to that provided for consumers of other forms of commerce</b> under their respective laws, regulations and policies.</p>	<p><b>ECIPE:</b> Restrictions on online sales and transactions.</p>
	<p><b>Cooperation</b> between their respective <b>national consumer protection agencies</b>.</p>	<p>Under Dialogue on Electronic Commerce, <b>agreeing to maintain a dialogue on the protection</b> of consumers and businesses from fraudulent and deceptive commercial practices in the sphere of electronic commerce.</p>		
Personal Information Protection/ Trust and Confidence in Electronic Commerce	<p>Adopting or maintaining a legal framework that provides for the protection of personal information.</p>	<p>Adopting or maintain laws, regulations, or administrative measures for the protection of personal information of users engaged in electronic commerce.</p>	<p>Taking such measures as it considers appropriate and necessary to protect the personal information of users of electronic commerce.</p>	<p><b>ECIPE:</b> Data policies (administrative requirements on data privacy, data retention, personal right to data privacy).</p>
	<p><b>Endeavouring to adopt non-discriminatory practices</b> in protecting users of electronic commerce.</p> <p><b>Publishing information</b> on the personal information protections.</p>			
	<p>Encouraging the development of mechanisms to <b>promote compatibility between these different regimes</b> (recognition, cooperation).</p>	<p>Taking into due consideration <b>international standards of data protection of relevant international organisations</b> of which both parties are members.</p>	<p>In the development of data protection standards, to the extent possible, <b>taking into account international standards and the criteria of relevant international organisations</b>.</p>	

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Paperless Trading	<p><b>Endeavouring to accept</b> trade administration documents submitted electronically as the legal equivalent of the paper version.</p> <p>Endeavouring to make <b>trade administration documents available to the public in electronic form.</b></p>		<p><b>Accepting the electronic versions of trade administration documents as the legal equivalent of paper documents,</b> except where there is a domestic or international legal requirement to the contrary or doing so would reduce the effectiveness.</p> <p><b>Cooperating bilaterally and in international forums</b> to enhance acceptance of electronic versions of trade administration documents. Endeavouring to take into account the <b>methods agreed by international organisations.</b></p> <p>Endeavouring to make all trade administration <b>documents available to the public as electronic versions.</b></p>	<p><b>ECIPE/ USTR/ Business/ CRS:</b> Trading restrictions.</p>
Principles on Access to and Use of the Internet for Electronic Commerce	<p>Recognising the benefits of consumers in their territories having the ability to access and use services and applications of a consumer's choice available on the internet, subject to <b>reasonable network management.</b></p>			<p><b>USTR:</b> Inappropriate application of old regulatory regimes to new business models.</p>

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Cross-Border Transfer of Information by Electronic Means	<p><b>Allowing the cross-border transfer of information by electronic means, including personal information</b>, when this activity is for the conduct of the business of a covered person.</p> <p><b>“Safeguard measures,”</b> i.e., can impose restrictions if the measure is not applied in a manner that would constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on trade does not impose restrictions on transfers of information greater than are required to achieve the objective.</p>			<p><b>ECIPE/ USTR/ Business/ CRS:</b> Cross-border data transfer, data privacy protection.</p>
Internet Inter-connection Charge Sharing	<p>Negotiating on a commercial basis for suppliers seeking international internet connection.</p>			
Location of Computing Facilities	<p><b>No requirement to use or locate computing facilities in that party’s territory as a condition for conducting business in that territory</b> (subject to the same “safeguard measures”).</p>			<p><b>ECIPE/ USTR/ Business/ CRS:</b> Unnecessary requirements to store data within a particular jurisdiction or locate computing facilities locally, as well as outright bans on cross-border data flows.</p>

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Unsolicited Commercial Electronic Messages	<p><b>Providing recourse against suppliers of unsolicited commercial electronic messages.</b></p> <p>Endeavouring to cooperate in appropriate cases of mutual concern.</p>	<p><b>Under Dialogue on Electronic Commerce, agreeing to maintain a dialogue on the treatment of unsolicited electronic commercial communications.</b></p>		<p><b>ECIPE:</b> Consumer protection.</p>
Endeavouring to cooperate in appropriate cases of mutual concern.	<p>Assisting SMEs.</p> <p>Exchanging information and sharing experiences on regulations, policies, enforcement, and compliance regarding electronic commerce.</p> <p>Participating actively in regional and multilateral fora to promote the development of electronic commerce.</p> <p><b>Encouraging development by the private sector of methods of self-regulation that foster electronic commerce, including codes of conduct, model contracts, guidelines, and enforcement mechanisms.</b></p>	<p><b>Under general provisions:</b> facilitating the use of electronic commerce by SMEs.</p> <p>Maintaining a dialogue on issues raised by electronic commerce.</p> <p>Affirming the importance of actively participating in multilateral fora to promote the development of electronic commerce.</p>	<p>Encouraging cooperation in research and training activities that would enhance the development of electronic commerce, including by sharing best practices on electronic commerce development.</p> <p>Endeavouring to undertake forms of cooperation that build on and <b>do not duplicate existing cooperation initiatives pursued in international forums.</b></p>	
Cooperation on Cybersecurity Matters	<p>Recognising the importance of <b>cooperation</b> and building the capabilities of national entities.</p>			<p><b>CRS:</b> Cybersecurity risks.</p>

Issue Areas (TPP Template)	TPP	CETA	ChAFTA	Correspondence to Identified Barriers
Source Code	<p><b>No requirement of the transfer of, or access to, source code of software owned by a person of another party</b>, as a condition for the import, distribution, sale, or use of such software or of products containing such software in its territory (subject to the same "safeguard measures").</p>			<p><b>ECIPE/ USTR/Business/CRS:</b> Technology barriers (requirements to disclose encryption algorithms or other proprietary source code).</p>
Transparency			<p>Promptly publishing, or otherwise promptly making publicly available all relevant measures of general application which pertain to, or affect, the operation of this Chapter.</p> <p>Responding promptly to all requests by the other party for specific information on any of its measures of general application.</p>	
Application and Relation to Other Chapters	<p><b>Other Chapters, including Chapter 9 (Investment), Chapter 10 (Cross-Border Trade in Services), and Chapter 11 (Financial Services) also apply to issues of electronic commerce.</b></p>	<p><b>Other Chapters of the Agreement prevail in case of inconsistency.</b></p>	<p><b>Dispute Settlement shall not apply to the provisions of this Chapter.</b></p>	

## References

Aaronson, Susan Ariel. 2016. "Solutions to the Digital Trade Imbalance." *VOX*, 7 March. <http://voxeu.org/article/solutions-digital-trade-imbalance>.

Aghion, Philippe, and Peter Howitt. 1992. "A Model of Growth Through Creative Destruction." *Econometrica* 60 (2): 323–51.

Akerman, Anders, Ingvil Gaarder, and Mogstad Magne. 2015. "The Skill Complementarity of Broadband Internet." *Quarterly Journal of Economics* 130 (4): 1781–1824.

Alba, Davey. 2017. "The World May Be Headed for a Fragmented 'Splinternet.'" *Wired*, 7 July. <https://www.wired.com/story/splinternet-global-court-rulings-google-facebook/>.

Alderman, Liz, and Amie Tsang. 2017. "Net Neutrality's Holes in Europe May Offer Peek at Future in U.S." *New York Times*, 10 December. <https://www.nytimes.com/2017/12/10/business/net-neutrality-europe-fcc.html>.

Atasoy, Hilal. 2013. "The Effects of Broadband Internet Expansion on Labor Market Outcomes." *ILR Review* 66 (2): 315–45.

Autor, David, David Dorn, Lawrence F. Katz, Christina Patterson, and John Van Reenen. 2017. "Concentrating on the Fall of the Labor Share." *American Economic Review: Papers and Proceedings* 107 (5): 180–5.

Azevêdo, Roberto. 2017. "WTO-eWTP-WEF Enabling E-commerce Launch Event: Remarks." World Trade Organization, 11 December. [https://www.wto.org/english/news\\_e/spra\\_e/spra206\\_e.htm](https://www.wto.org/english/news_e/spra_e/spra206_e.htm).

Brander, James A., and Barbara J. Spencer. 1985. "Export Subsidies and International Market Share Rivalry." *Journal of International Economics* 18 (1–2): 83–100.

Brunsdon, Jim. 2017. "Brussels in Push on Social Protection for Gig Economy Workers." *Financial Times*, 26 April. <https://www.ft.com/content/bff01a7a-29cb-11e7-bc4b-5528796fe35c>.

Business Europe. 2017. "BusinessEurope's views on Digital Trade." Position Paper, February. [https://www.buinessurope.eu/sites/buseur/files/media/position\\_papers/rex/2017-02-06\\_digital\\_trade.pdf](https://www.buinessurope.eu/sites/buseur/files/media/position_papers/rex/2017-02-06_digital_trade.pdf).



Caselli, Francesco, and Wilbur John Coleman II. 2001. "Cross-Country Technology Diffusion: The Case of Computers." NBER Working Paper 8130. National Bureau of Economic Research. <http://www.nber.org/papers/w8130>.

Cernat, Lucian, and Zornitsa Kutlina-Dimitrova. 2015. "International Public Procurement: From Scant Facts to Hard Data." European Commission, Directorate General of Trade Chief Economist Note 1.

Chander, Anupam. 2009. "Trade 2.0." *UC Davis Legal Studies Research Paper* 173. School of Law, University of California, Davis. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1413884](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1413884).

Chander, Anupam, and Uyen P. Le. 2014. "Breaking the Web: Data Localization vs. the Global Internet." *UC Davis Legal Studies Research Paper* 378. School of Law, University of California, Davis. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2407858](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2407858).

Choi, Changkyu, and Myung Hoon Yi. 2009. "The Effect of the Internet on Economic Growth: Evidence from Cross-Country Panel Data." *Economics Letters* 105 (1): 39–41.

CIRA (Canadian Internet Registration Authority). 2014. "The Canadian Internet." In *CIRA Factbook 2014*. <https://cira.ca/factbook/2014/the-canadian-internet.html>.

Ciuriak, Dan. 2017a. "Intellectual Property Proliferation: Strategic Roots and Strategic Responses." *CIGI Papers* 121. Centre for International Governance and Innovation. <https://www.cigionline.org/publications/intellectual-property-proliferation-strategic-roots-and-strategic-responses>.

Ciuriak, Dan. 2017b. "The Knowledge-Based and Data-Driven Economy: Quantifying the Impacts of Trade Agreements," *CIGI Papers* 156. Centre for International Governance and Innovation. <https://www.cigionline.org/publications/knowledge-based-and-data-driven-economy-quantifying-impacts-trade-agreements>.

Ciuriak, Dan, and John M. Curtis. 2015. "The Impact of Trade Agreements on Innovation: Implications for Canadian Trade Policy." *Working Paper*, 21 December. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2706731](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2706731).

Clarke, George R. G. 2008. "Has the Internet Increased Exports for Firms from Low and Middle-Income Countries?" *Information Economics and Policy* 20: 16–37.

Clarke, George R. G., and Schott J. Wallsten. 2006. "Has the Internet Increased Trade? Developed and Developing Country Evidence." *Economic Inquiry* 44 (3): 465–84.

Council of Economic Advisers. 2015. "Mapping the Digital Divide." *Issue Brief*, July. [https://obamawhitehouse.archives.gov/sites/default/files/wh\\_digital\\_divide\\_issue\\_brief.pdf](https://obamawhitehouse.archives.gov/sites/default/files/wh_digital_divide_issue_brief.pdf)

Czernich, Nina, Oliver Falck, Tobias Kretschmer, and Ludger Woessmann. 2011. "Broadband Infrastructure and Economic Growth." *Economic Journal* 121 (552): 505–32.

ECIPE (European Centre for International Political Economy). 2017. "Digital Trade Estimates Project." <http://ecipe.org/dte/>.

Economist. 2016. "What Is the "Splinternet"?" *The Economist Explains*, 22 November. <https://www.economist.com/blogs/economist-explains/2016/11/economist-explains-11>.

European Commission. 2011. "European Union-United States Trade Principles for Information and Communication Technology Services." [trade.ec.europa.eu/doclib/docs/2011/april/tradoc\\_147780.pdf](trade.ec.europa.eu/doclib/docs/2011/april/tradoc_147780.pdf).

European Commission. 2015. "Information and Communication Technologies (ICT) in TTIP." Brussels: European Commission.

European Commission. 2017. "First Annual Review of the EU-U.S. Privacy Shield." Press Release, 18 October. [http://ec.europa.eu/newsroom/just/item-detail.cfm?item\\_id=605619](http://ec.europa.eu/newsroom/just/item-detail.cfm?item_id=605619).

Fefer, Rachel F., Shayerah Ilias Akhtar, and Wayne M. Morrison. 2017. "Digital Trade and US Trade Policy." Washington, DC: Congressional Research Service. <https://www.hsdl.org/?abstract&did=801365>.

Feng, Emily, and Yuan Yang. 2017. "Baidu Offers Open-Source Car Software as Lure for Data." *Financial Times*, 5 July.

Finley, Klint. 2017. "Google's Big EU Fine Isn't Just about the Money." *Wired*, 27 June. <https://www.wired.com/story/google-big-eu-fine/>.

Geist, Michael. 2016. "The Trouble with the TPP, Day 11: Weak Privacy Standards." Michael Geist, 18 January. <http://www.michaelgeist.ca/2016/01/the-trouble-with-the-tpp-day-11-weak-privacy-standards/>.

Global Commission on Internet Governance. 2016. *One Internet*. Report. Centre for International Governance Innovation and Chatham House.

Goldsmith, Jack, and Tim Wu. 2006. *Who Controls the Internet? Illusions of a Borderless World*. Oxford: Oxford University Press.

Hamilton, Daniel S. 2017. "Section Four: Challenges." In *The Transatlantic Digital Economy 2017*. Washington, DC: Center for Transatlantic Relations.

Jorgenson, Dale W., Mun S. Ho, and Kevin J. Stiroh. 2008. "A Retrospective Look at the US Productivity Growth Resurgence." *Journal of Economic Perspectives* 22 (1): 3–24.

Kariyawasam, Rohan. 2015. *New WTO Trade Rules for Bits and Bytes?* E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum.

Kinstler, Linda. 2017. "Can Germany Fix Facebook?" *The Atlantic*, 2 November. <https://www.theatlantic.com/international/archive/2017/11/germany-facebook/543258/>.

Kraemer, Kenneth L., Jennifer Gibbs, and Jason Dedrick. 2005. "Impacts of Globalization on E-Commerce Use and Firm Performance: A Cross-Country Investigation." *Information Society* 21: 323–40.

Krugman, Paul R. 1979. "Increasing Returns, Monopolistic Competition, and International Trade." *Journal of International Economics* 9 (4): 469–80.

Krugman, Paul R. 1980. "Scale Economies, Product Differentiation and the Pattern of Trade." *American Economic Review* 70 (5): 950–9.

Lawless, Martha. 2017. "Global Digital Trade." Presentation. Elliott School of International Affairs, George Washington University, 1 December.

Lee, Dave. 2017. "AirBnB Host Fined after Racist Comment." *BBC News*, 13 July. <http://www.bbc.com/news/technology-40602926>.

López González, Javier, and Marie-Agnes Jouanjean. 2017. "Digital Trade: Developing a Framework for Analysis." *OECD Trade Policy Papers* 205. Organisation for Economic Co-operation and Development.

Lucas, Robert E. 1998. "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22: 3–42.

Lund, Susan, and James Manyika. 2016. *How Digital Trade Is Transforming Globalisation*. E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum.

Malcomson, Scott. 2016. *Splinternet: How Geopolitics and Commerce Are Fragmenting the World Wide Web*. New York: OR Books.

McCabe, David. 2017. "Why Regulating Google and Facebook Like Utilities Is a Long Shot." AXIOS, 22 September. <https://www.axios.com/regulating-google-facebook-2487984773.html>.

Meltzer, Joshua P. 2015. *A New Digital Trade Agenda*. E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum.

Michaels, Guy, Ashwini Natraj, and John Van Reenen. 2014. "Has ICT Polarized Skill Demand? Evidence from Eleven Countries over Twenty-Five Years." *Review of Economics and Statistics* 96 (1): 60–77.

Monga, Vipal. 2016. "Accounting's 21st Century Challenge: How to Value Intangible Assets." *Wall Street Journal*, 21 March. <https://www.wsj.com/articles/accountings-21st-century-challenge-how-to-value-intangible-assets-1458605126>.

Mullins, Brody, Rolfe Winkler, and Brent Kendall. 2015. "Inside the U.S. Antitrust Probe of Google." *Wall Street Journal*, 19 March. <https://www.wsj.com/articles/inside-the-u-s-antitrust-probe-of-google-1426793274>.

Nakamura, Leonard, Jon Samuels, and Rachel Soloveichik. 2017. "Measuring the 'Free' Digital Economy within the GDP and Productivity Accounts." Working Paper 17-37, Research Department, Federal Reserve Bank of Philadelphia.

OECD. 2014a. "Action Plan on Base Erosion and Profit Shifting." Paris: Organisation for Economic Co-operation and Development.

OECD. 2014b. "Cloud Computing: The Concept, Impacts and the Role of Government Policy." *OECD Digital Economy Papers* 240. Paris: Organisation for Economic Co-operation and Development.

OECD. 2014c. "Measuring the Digital Economy: A New Perspective." Paris: Organisation for Economic Co-operation and Development.

OECD. 2016a. "Digital Convergence and Beyond: Innovation, Investment and Competition in Communication Policy and Regulation for the 21st Century." *OECD Digital Economy Papers* 251. Paris: Organisation for Economic Co-operation and Development.

OECD. 2016b. "New Forms of Work in the Digital Economy." *OECD Digital Economy Papers* 260. Paris: Organisation for Economic Co-operation and Development.

OECD. 2016c. "The Internet of Things: Seizing the Benefits and Addressing the Challenges." *OECD Digital Economy Papers* 252. Paris: Organisation for Economic Co-operation and Development.

Oliner, Stephen D., Daniel E. Sichel, and Kevin J. Stiroh. 2007. "Explaining a Productive Decade." *Finance and Economics Discussion Series* 2007-63. Washington, DC: Federal Reserve Board.

Ong, Thuy. 2017. "Microsoft and Facebook Just Laid a 160-Terabits-per-Second Cable 4,100 Miles across the Atlantic." *The Verge*, 25 September. <https://www.theverge.com/2017/9/25/16359966/microsoft-facebook-transatlantic-cable-160-terabits-a-second>.

Porges, Amy, and Alice Enders. 2016. *Data Moving Across Borders: The Future of Digital Trade Policy*. E15 Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum.

Rauhala, Emily. 2016. "America Wants to Believe China Can't Innovate. Tech Tells a Different Story." *Washington Post*, 19 July. [https://www.washingtonpost.com/world/asia\\_pacific/america-wants-to-believe-china-cant-innovate-tech-tells-a-different-story/2016/07/19/c17cbea9-6ee6-479c-81fa-54051df598c5\\_story.html?utm\\_term=.503d1bcbe0fa](https://www.washingtonpost.com/world/asia_pacific/america-wants-to-believe-china-cant-innovate-tech-tells-a-different-story/2016/07/19/c17cbea9-6ee6-479c-81fa-54051df598c5_story.html?utm_term=.503d1bcbe0fa).

Romer, Paul M. 1990. "Endogenous Technological Change." *Journal of Political Economy* 98 (5.2): 71–102.

Rosen, Sherwin. 1981. "The Economics of Superstars." *American Economic Review* 71 (5): 845–58.

Savage, John E., and Bruce W. McConnell. 2015. *Exploring Multi-Stakeholder Internet Governance*. New York: East-West Institute.

Stoltz, Mitch. 2016. "Shining a Spotlight on Shadow Regulation of the Internet: 2016 in Review." Electronic Frontier Foundation, 31 December. <https://www.eff.org/deeplinks/2016/12/shining-spotlight-shadow-regulation-internet>.

Subramanian, Ramesh. 2013. "Internet Governance: A Developing Country Perspective." *Communications of the IIMA* 13 (4): Article 1.

Tuthill, Lee. 2016. "E-commerce and the WTO." MIKTA Workshop on Electronic Commerce, Geneva, 5 July.

UNCTAD. 2015. "Information Economy Report 2015: Unlocking the Potential of E-commerce for Developing Countries." Geneva: United Nations Conference on Trade and Development.

UNCTAD. 2016. "Data Protection Regulations and International Data Flows: Implications for Trade and Development." Geneva: United Nations Conference on Trade and Development.

UNESCAP (United Nations Economic and Social Commission for Asia and the Pacific). 2016. "Chapter 7: International Trade in a Digital Age." In *Asia-Pacific Trade and Investment Report 2016: Recent Trends and Developments*. Bangkok: UNESCAP.

USITC (United States International Trade Commission). 2013. "Digital Trade in the U.S. and Global Economies, Part 1" Washington, DC: USITC.

USITC (United States International Trade Commission). 2016a. "Digital Trade in the U.S. and Global Economies, Part 2" Washington, DC: USITC.

USITC (United States International Trade Commission). 2016b. "Trans-Pacific Partnership Agreement: Likely Impact on the U.S. Economy and on Specific Industry Sectors." Washington, DC: USITC.

USTR (United States Trade Representative). 2017. "Key Barriers to Digital Trade." <https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2017/march/key-barriers-digital-trade>.

van Ark, Bart, Mary O'Mahony, and Marcel P. Timmer. 2008. "The Productivity Gap between Europe and the United States: Trends and Causes." *Journal of Economic Perspectives* 22 (1): 25–44.

Van Reenan, John, and Christina Patterson. 2017. "The Rise of Superstar Firms Has Been Better for Investors Than for Employees." *Harvard Business Review*, 11 May.

Vemuri, Vijay K., and Shahid Siddiqi. 2009. "Impact of Commercialization of the Internet on International Trade: A Panel Study Using the Extended Gravity Model." *International Trade Journal* 23 (4): 458–84.

World Bank Group. 2016. *World Development Report 2016: Digital Dividends*. Washington, DC: World Bank.

WTO. 1998. "Work Programme on Electronic Commerce." World Trade Organization. [https://www.wto.org/english/tratop\\_e/ecom\\_e/wkprog\\_e.htm](https://www.wto.org/english/tratop_e/ecom_e/wkprog_e.htm).

Wu, Mark. 2017. *Digital Trade-Related Provisions in Regional Trade Agreements: Existing Models and Lessons for the Multilateral Trade System*. E15 Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum.

Wu, Tim. 2017. "Why the Courts Will Have to Save Net Neutrality." *New York Times*, 22 November. <https://www.nytimes.com/2017/11/22/opinion/courts-net-neutrality-fcc.html>.



Jointly implemented by the International Centre for Trade and Sustainable Development (ICTSD) and the Inter-American Development Bank (IDB), the RTA Exchange works in the interest of the sharing of ideas, experiences to date and best practices to harvest innovation from RTAs and leverage lessons learned towards progress at the multilateral level. Conceived in the context of the E15 Initiative, the RTA Exchange creates a space where stakeholders can access the collective international knowledge on RTAs and engage in dialogue on RTA-related policy issues.

