



## Digital Technologies, Services and the Fourth Industrial Revolution

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## Abstract

The increasingly rapid uptake of digital technologies is launching the global economy into the ‘Fourth Industrial Revolution’ and the next transformative wave of globalisation. Trade in merchandise is in long-run relative decline; trade in services, especially e services, is on a long-term relative upward trend - and associated cross-border data flows are growing exponentially. These structural shifts, and their impacts on competitiveness, are set to intensify. The G20 must assert a leadership role by signalling best practice policy and regulatory settings, including sustained openness to international trade, investment and data flows, so every nation can reap the productivity gains of the digital age. This Working Paper has been prepared as background for a short Policy Brief for the 2020 THINK20 Taskforce 1: Trade and Investment.

### Challenge: Managing the transformation to digital trade

From 3D printing (3DP) and artificial intelligence (AI), to cloud computing, 5G, and the Internet-of-Things (IoT), digital technologies are prompting radical new business models offered through digital platforms, that promise unparalleled productivity gains and global increases in standard-of-living.

Adoption of new technologies is also impacting traditional demand and employment patterns in highly disruptive ways and radically altering the nature of consumer and business transactions. The changes underway raise major questions for traditional domestic regulatory settings and for trade, investment, innovation and industry policies for the digital age. They point to an urgent need for reform of international trade governance especially at multilateral level. Digitally-enabled trade - lets call it e-commerce - is the big global trade growth story. We are on the cusp of a structural revolution, which ushers in the digital age. The trading system needs to get ready fast.

Services are integral to the industry transformations underway and their cross-border tradability is growing as a result. Recent estimates suggest 50% of traded services are already digitally-enabled compared with 15% of traded goods<sup>1</sup>. Just as services are critical inputs into production of both manufactures and services, trade in digitally-enabled services (digitised services or e-services) is dependent on and underpinned by cross-border data flows. These are growing exponentially, now contributing more to global GDP than traded goods flows<sup>2</sup>.

Once perceived as relatively low productivity and less tradeable than manufactures, services are now in the global economic limelight. Almost any service can be packaged digitally and provided on-line in high value-added format, from any location in the world. As digitised services trade and underlying data flows increasingly form the digital economy backbone, policy makers across national jurisdictions are responding in different ways. The challenge is to learn from each other, to share best practices, to cooperate and to get the policy and regulatory responses right.

Unfortunately the response has sometimes already had negative impacts; increasing the otherwise low trade costs of e services, constraining development of new services offerings and inhibiting the trade growth potential on offer. Trade-restrictive responses impact most on small and medium-sized enterprises (SMEs) and run the risk of curtailing the many development dividends.

In manufacturing, automation, advanced robotics and 3DP are beginning to compensate for wage differentials as factors determining companies’ production locations and investment decisions. For services industries on the other hand, while some require talent that remains scarce in developing countries, a growing variety of services are performed and delivered remotely through automated tasks. Developing country wage differentials will continue to attract this work. Indeed the evident

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<sup>1</sup> McKinsey Global Institute (2016)

<sup>2</sup> McKinsey Global Institute (2016)

trend increase in demand for off-shore e services from developing countries is expected to intensify<sup>3</sup>.

As the digital age takes hold, e services will grow in importance in international trade, both in their own right and as supporting pillars of trade in goods. The G20 has a responsibility to ensure that the potential growth in international trade flows, with consequent global gains in economic growth and development, is facilitated rather than stymied.

G20 guidance is urgent. Against the background of trade disruptions wrought by the COVID-19 public health pandemic, G20 responses will be critical to how effectively the global trading system can weather the potential anti-globalisation backlash and secure the reforms so urgently required for digital trade to flourish.

### **Impact of the COVID-19 pandemic**

The response to the COVID-19 pandemic is intensifying the push to digitalisation, as goods producers work to lower their vulnerabilities and services firms learn by doing. There is no doubt that the pandemic has impacted significantly already on global value chains in both goods and services industries and witnessed in particular a strong shift towards digital delivery of services which is likely to prove irreversible, itself leading to a number of changes in demand for associated digital business services.

In particular, the pandemic has witnessed an immediate intensification in the growth of demand for information and communications technology (ICT) services. Some ICT services have proved especially critical to the global effort to combat COVID-19. These include: remote exchanges among research teams to fight against the virus and look for medicines and vaccines; e-health services to allow daily medical services to be delivered to millions of patients; e-learning services to allow teachers to continue the education of millions of pupils and students; teleworking facilities to allow workers to stay at home but continue to sustain economic activity; digital payment and financial services to enable e-commerce and on-line services; and connectivity services that minimize the adverse effects of social distancing.

International cooperative measures to facilitate the free flow of anonymous medical/health data among trusted partners, as well as the temporary movement of health-care professionals has often proved vital in this context. There has however been a marked degree of lack of international government coordination in approaches to enabling the ongoing provision of essential services during periods of extended lockdown. This has unquestionably impacted negatively on services value chains and on the information technology/business-process outsourcing sector in particular.

In a number of developing countries with strong digitally-enabled services export performance via for example call-centres, the policy stance has failed to recognise the ICT sector as essential and has led to complete closure of the call centres. This has forced immediate reshoring in many services sectors from telecommunications to banking and insurance, which would not otherwise wish to reshore but have no choice but to do so in order to maintain their own operations. To some extent, this process of reshoring may prove temporary, at least with respect to digitally-enabled cross-border trade in services. But it may well lead to a more prolonged downturn in investment sentiment with respect to commercial presence offshore.

In the manufacturing sector, digital technologies and digitally-enabled services are heavily used in supply chain intensive industries and advanced manufacturing, including electronics, motor vehicles and machinery. Some reshoring is similarly likely to take place in these sectors, if with a longer time lag - and perhaps hand-in-hand with labour cost-saving via automation, for which digital technologies and their associated services will see greater demand to support that automation. The COVID-19 crisis

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<sup>3</sup> Baldwin (2019)

also exposes the lack of visibility of global supply chains, given international trade is notoriously reliant on paper-based processes. Digitising the supply chain is no longer a nice-to-have, but becomes imperative to maintain visibility and manage supply chain risks. Blockchain technology should be applied to ensure privacy and give suppliers an incentive to share their data in the supply chain. This would contribute to the anticipated medium to longer term trend increase in services traded internationally.

In both goods and services sectors, supply chain disruption inevitably leads to some corporate re-assessment of production models and an effort to develop more resilience including by diversifying essential suppliers from other places around the globe or closer to home. But on balance, the current positive impact on demand for services is likely to be confirmed for the longer run.

## Policy Recommendations

We identify 4 inter-related areas of policy as critical for grasping the opportunities presented by the Fourth Industrial Revolution. These encompass trade, development, labour market and industry/innovation policy.

### 1. Updating the World Trading System

Global trade governance must be updated to ensure it is fit for purpose when it comes to digital trade. The multilateral trading system also needs to be updated to ensure that 21st century trade and investment would bring greater benefits to most developing countries and to allow them to gain from new technological progress.

There is no single recognized and accepted definition of digital trade. The concept is generally perceived in a broad sense that encompasses international trade enabled by digital technologies. The term “*digital trade*” is often used interchangeably with terms such as “*electronic commerce*” or “*trade aspects of e-commerce*.” The WTO defines e-commerce as “the production, distribution, marketing, sale or delivery of goods and services by electronic means.” This definition does not explicitly include data flows. If and how to include them is debated<sup>4</sup>. The draft UN Handbook on measuring digital trade proposes to include cross-border data flows that contribute to consumer welfare and can be measured as such<sup>5</sup>.

The digital transformation of trade and society at large has accelerated during the COVID-19 crisis. Today, data flows with, or are embedded in, any trade transaction one way or another, and most trade transactions fall under WTO’s definition of digital trade. Digital aspects must therefore be streamlined into global trade governance, and should not be confined to the agreement on e-commerce.

The COVID-19 public health crisis has revealed both the degree to which supply chains depend on open markets and shortcomings in the world trading system. The surge in international collaboration on developments of a vaccine and clinical testing of medicine is heartening. Lack of discipline on export duties and taxes, on the other hand, reveals an anomaly with potentially severe consequences in a crisis.

The significant supply chain disruption as a result of the COVID 19 public health pandemic risks is already spawning a backlash against globalization in many communities. The G20 needs to send very strong messages that the G20 members will not use the public health crisis as cover for inward turning protectionist trade and industry policies following recovery from the crisis.

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<sup>4</sup> One consideration is whether data flows fall under the definition of trade as a transaction between residents and non-residents. If transactions imply remuneration, non-remunerated data flows fall outside the scope of the statistical definition of trade. Yet non-remunerated data flows support and enable trade.

<sup>5</sup> OECD, WTO & IMF (2020)

The WTO's World Trade Report 2019 provided definitive evidence that with trade costs in services declining with the adoption of new digital technologies, trade in services is on a strong relative growth path, outpacing growth in trade in goods. Traffic in data is also growing exponentially. G20 Leaders, meeting in November 2020, have the opportunity to take forward a services trade policy agenda for a digital future.

The transition to digitalisation intensifies the need for greater regulatory cooperation in services and adoption of regulatory best practices for the digital environment. Today's biggest trade, investment and innovation policy challenge is to ensure that WTO members develop the international governance and regulatory principles required for sustained inclusive growth in the digitizing and increasingly services-dominated global economy.

To help meet this challenge, the G20 must focus on steps to improve international governance in trade in e-services, in cross-border data flows and in e-commerce more generally, both business-to-consumer (B2C) and business-to-business (B2B) transactions, the latter already being the long dominant flow in global value chains in services.

### **1.1 Market access for e commerce**

In 2019 more than 70 Members launched WTO negotiations on trade-related aspects of electronic commerce, which would seek a 'high-standard agreement that creates strong, market-based rules' and 'reduces the barriers around the world that threaten to undermine the growth of the digital economy.' The G20 needs as a minimum to recognise the importance of these negotiations and call on all WTO Members G20 to join as observers if not full participants.

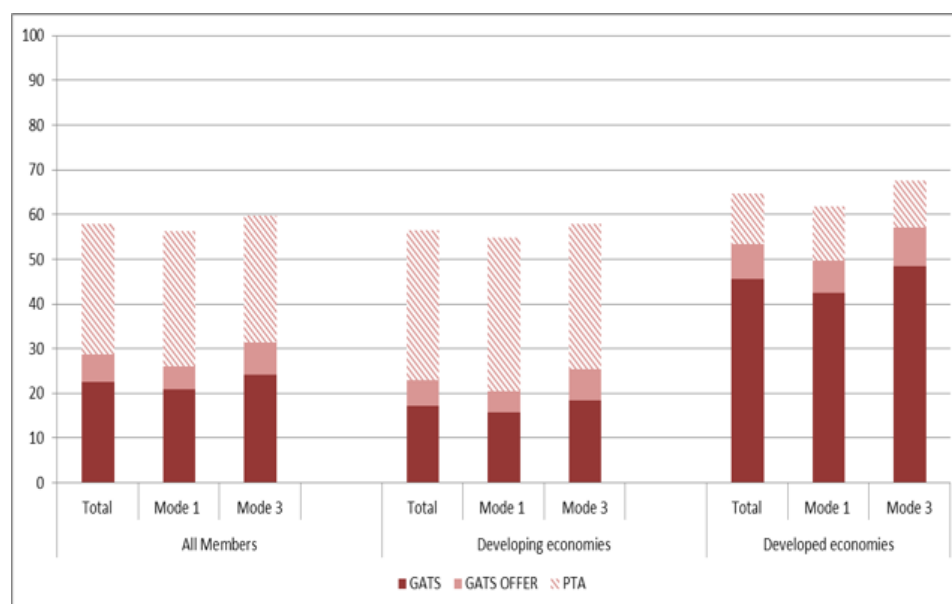
The fourth industrial revolution is the world's biggest and best opportunity for productivity gain, economic growth and social-economic development. Maximising the opportunities requires maximum connectivity. But regulatory trends over the last 3 years have been highly constraining of trade in digitally-enabled services and the emerging digital economy is in serious danger of fragmenting rather than globalising. These dangerous trends need to be reversed. The WTO negotiations on e commerce offer a potential solution. All WTO members owe it to their own competitive futures to engage.

It is important for the credibility of the WTO system, that these negotiations include a services market access element. Data-intensive digitally-enabled business services are the fastest growing component of world trade, delivering vital business inputs to all sectors of the economy. But WTO Members have made fewer services commitments under Mode 1 (cross-border trade through the internet) than for any other Mode , not only in the GATS but also in bilateral agreements (Figure1).

G20 members, whether or not they participate in the plurilateral WTO negotiations on E-Commerce, could jointly grasp the low-hanging fruit and together signal a preparedness to initiate first steps to increase transparency with respect to Mode 1. One approach would involve voluntarily updating their GATS schedules to remove and replace all references in the schedules to Mode 1 not being technically feasible, hence not applicable.



**Figure 1: Mode 1 Commitments**



Source: Tuthill, L. (2018). WTO Secretariat, Geneva.

## 1.2 Reviewing the WTO Moratorium on Customs Duties on E Transmissions

For 20 years, the global trading system has witnessed widespread benefits from the absence of tariffs on electronic transmissions. In particular, it has facilitated innovation everywhere including the adoption by SMEs in developing countries, of digital business tools enabling a big drop in trade costs, participation in global services value chains and take-off in business services exports<sup>6</sup>.

G20 members could confirm that levying of tariffs on electronic transmissions can be expected to be fraught with practical difficulties and inefficiencies for the following reasons:

- First, taxes are best levied on a broad base (such as VAT or sales tax) and on goods or services with low demand elasticities. Electronic transmissions and online services are a small fraction of trade and e-commerce tends to be price sensitive.
- Second, the technical difficulties (if not near impossibility) of tracking and subsequently taxing electronic transmissions cross-border renders this kind of revenue generation extremely cost-ineffective.
- Third, electronically transmitted 'digitisable goods' have very high services intensity and are increasingly different from their physical counterparts; for instance, whilst software (such as operating systems) used to be purchased 'in one go' on CD-ROM, the service of an operating system nowadays resembles an 'interactive process' with frequent updates, and may reside entirely in the cloud. And this is before considering the treatment of related services or apps that are notionally provided for free.
- Fourth, the value of 3D printing computer-aided design (CAD) files are hard to ascertain as it depends on the subsequent number of printings in the destination country.
- Fifth, customs duties on electronic transmissions would not address concerns about various forms of digital divides or tackle the problem of developing country firms' lack of digital competitiveness. On the contrary, imports of 'digitisable products' like software help current and prospective exporters from developing countries improve their production processes and enhance quality and competitiveness of their export goods and services.

G20 members could note that in the digital age, value-added (VAT) or sales tax may be more practical revenue raising alternatives to customs duties and commission a joint study of the above factors.

<sup>6</sup> Makayama & Narayanan (2019) and Andrenelli & Lopez-Gonzalez (2019)

### 1.3 Adopting Principles for domestic regulation for services

Efficient and non-discriminatory services regulation can be an important driver of technology diffusion, thereby helping local firms participate in the Fourth Industrial Revolution.

G20 members should aim at reducing the costs for service suppliers that arise from compliance with multiple regulatory regimes across export markets. Regulatory differences cannot be avoided as governments pursue their legitimate right to regulate, but the associated trade costs can be substantially eased through regulatory cooperation and agreements on mutual recognition of standards as well as compliance assessments. These costs are often independent of export value and hurt SMEs more than large enterprises. Even reasonable and necessary regulation may constitute insurmountable trade costs for SMEs merely because they differ from equivalent regulation at home.

Notable progress in developing regulatory disciplines with respect to services has been made on several fronts in the past 2 years, at the bilateral, regional and plurilateral level<sup>7</sup>. In the WTO, the Joint Initiative on Services Domestic Regulation announced in 2017 has resulted in outcomes which await adoption at the next WTO Ministerial Conference<sup>8</sup>. G20 members should signal their support for these outcomes and their willingness to incorporate associated additional commitments into their GATS Schedules on a most-favoured nation (MFN) basis.

Further, G20 members could agree that this recent progress provides an opportunity to agree more widely on regulatory principles that protect consumers and privacy while seizing the opportunities of digital trade in knowledge-intensive services. The WTO Reference Paper on Telecommunications should be revisited against the backdrop of the technological revolution the sector has experienced since the Reference Paper came into force in 1998. In particular its scope should be clarified to ensure it covers all firms doing business through internet platforms.

Almost all governments pursue policies specifically designed to help SMEs, which typically account for the overwhelming majority of businesses in any economy and a substantial share of private-sector employment. Whilst SME participation in international trade is known to be significantly lower than the trading activities of larger-sized businesses, participation in global value chains and the digitisation of the economy are offering new and important avenues for SMEs to thrive and grow<sup>9</sup>. This is partly because digital content and associated services, once created, can be traded to overseas markets at virtually zero additional cost. It is also the case that such activities, from professional services to the creative industries, are typically provided by SMEs. Yet SMEs require dedicated policy support to be able to break into e-commerce and to take advantage of digital opportunities:

- Domestic regulation and provisions in multilateral or plurilateral agreements need to strike a balance between supporting free flows of data and customer privacy and security, respectively, and in so doing should consider opportunities to ease the compliance costs for SMEs. This would help because any regulatory burdens of a fixed-cost nature are more difficult to surmount for SMEs.
- Digitisation can enable SMEs to potentially scale up rapidly to global markets via online platforms of various sorts. For this channel to work, the considerable structural imbalance between powerful platforms on the one hand and smaller firms on the other hand needs to

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<sup>7</sup> APEC adopted a voluntary set of *Non-binding Principles for Domestic Regulation of the Services Sector* in 2019. These are expected to serve as a guideline for successful regulatory reform and the promotion of regulatory cooperation at a regional level. The importance of disciplines on domestic regulation is also recognized in recent preferential trade agreements, for example the Comprehensive and Progressive TransPacific Partnership (CPTPP), the Canada-European Union (EU) Economic and Trade Agreement (CETA) and the United States (US), Mexico, Canada Agreement (USMCA), which all incorporate disciplines on domestic regulation that support those at the multilateral level.

<sup>8</sup> WTO Press Release (2019)

<sup>9</sup> ERIA (2018)

- be addressed by competition policy to prevent the abuse of market power, and the credible enforcement of such disciplines.
- A permanent moratorium on the levying of customs duties on electronic transmissions would particularly benefit SMEs that engage in digital trade and e-commerce.
- Since many digital goods and services consist of or incorporate intangible assets, the protection of intellectual property rights assumes special significance for facilitating e-services and e-commerce. For instance, flexibility in domestic regulation of registering intellectual property, for both domestic and foreign entities, will be particularly helpful for smaller businesses.

We call on the G20 to ensure that the particular opportunities for SMEs in the digital economy, namely to participate in e-commerce and e-services, are seized in domestic regulation and in negotiations at the WTO.

#### **1.4 Introducing disciplines on cross-border data flows and data localisation**

The lack of internationally comparable statistics on digital trade makes evidence-based policy making a challenge. But the need for policies to deal with services and digital trade flows is greater than ever. Barriers to the international exchange of digitally-enabled services and to the free flow data, which are underpinning digitisation, economic growth and trade, are being erected without a clear understanding of their costs and long-run impacts.

Digital services such as e-health are proving a crucial part of the response to the COVID-19 crisis as such services can provide rapid relief to alleviate local bottlenecks in healthcare provision. More broadly, the social distancing measures enforced in many economies around the world come at significant economic costs, and it is only through a range of digital technologies and cross-border services (from online education to e-signatures and new modes of communication) that many activities can be kept afloat that would otherwise have been shut down. Whilst reliance on online interactions during the COVID-19 crisis has exposed new threats to privacy that will have to be addressed, the benefits of digitally-enabled services that rely on unimpeded cross-border data flows for ensuring business continuity and agility are clearly in evidence. A push for international standards and agreed disciplines on cross-border data flows will lock these benefits in now and will provide the ground for harnessing the benefits of digital services going forward.

Restrictions on cross-border flows of data have an supplementary negative impact on trade in services<sup>10</sup>. Regulations requiring that data be localized domestically have an especially adverse effect. Such restrictions are motivated by cybersecurity concerns, privacy considerations, consumer rights, regulatory oversight and digital industrial policy. Currently, disciplines on cross-border data flows secure governments' right to regulate, while encouraging regulations not to unnecessarily restrict trade. These disciplines help, but a coherent common framework would be better. Different local security standards and regulations combined with data localization requirements may in fact make cyber attacks easier. Indeed, privacy and consumer rights would be better protected with interoperable regulations, which would also reduce legal uncertainty for cross-border e-commerce.

Countries adopt various legal approaches to control cross-border data flows, depending upon their unique economic, social and political structure. While some of these measures generally follow the traditional model of privacy (personal data) protection, others require local storage or local process or data, or a ban on data transfers. Whatever the approach used, many of these measures appear to run counter to the underlying logic of the Internet by transforming a borderless cyberspace into 'balkanised' units, which in turn adversely affects the digital economy.

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<sup>10</sup> Ferracane & van der Marel (2018)



G20 members should confirm their understanding that cross-border data flows fall under the definition of trade, as suggested by the UN task force on measuring digital trade. Data flows could then be integrated in the General Agreement on Trade in Services (GATS) framework relatively easily. Horizontal obligations on cross-border data flows and data localization requirements would considerably strengthen global governance of cross-border data flows. Governments may continue to rely on “exceptions” such as national security in trade agreements to justify their actions to restrict data flows, unless their legitimate domestic policy needs are met.

The development of international rules on cross border data flows and internet-based activities is a critical factor for firm level competitiveness including for SMEs. The ‘regulatory jungle’ in regard of cross-border data flows makes compliance challenging and directs resources away from more effective mechanisms. In many cases a service supplier must comply with a myriad of overlapping or conflicting domestic regulations and seek multiple regulatory approvals for routine cross-border transfers, all of which contribute to impeding trade flows and raising cost.

It has been shown in the context of services trade policies that regulatory heterogeneity across OECD economies matters for the value of trade; specifically, a reduction in regulatory heterogeneity by 0.05 points is on average associated with 2.5% higher services exports<sup>11</sup>. It is plausible to assume that addressing the ‘regulatory jungle’ pertaining to the governance of data flows might entail a similar trade-enhancing effect.

### **1.5 Enabling digital flows with trust through privacy regulation**

Complex privacy regulatory regimes reduce flexibility of the service suppliers, increase<sup>12</sup> compliance costs, and inhibit them from managing operations in an efficient manner. The increasing burden to comply with diverse local privacy rules also impacts the price of goods and services offered to consumers. This is an emerging problem as companies collect and analyse personal data to better understand customers’ preferences and willingness to pay, and adapt their products and services accordingly.

It is a simple fact that international trade involving consumers cannot take place without collecting and sending personal data across borders - such as names, addresses and billing information. While work on domestic privacy frameworks is underway across the globe, modern technology, especially the internet and cloud data storage, mean that as each country determines its domestic data privacy regime, it needs to consider how it applies to firms that transfer data between jurisdictions, how respective regulatory agencies cooperate with foreign counterparts, and how these can be supported via modern trade agreements.

The discussion around global data governance has been building for some time; most recently with Japanese Prime Minister Abe’s 2019 initiative for “data free flow with trust.” This initiative at the 2019 G20, and related discussions within trade agreements in the Asia Pacific and elsewhere, show that a growing number of countries recognise the need for greater coordination and new norms and agreements to manage data flows and data privacy given they are now critical parts of the global digital economy.

Building global data governance is challenging given the varying approaches to data privacy. While national laws often share many of the same core principles, such as the OECD privacy principles, there is no one harmonised approach to privacy<sup>13</sup>. This is why interoperability has been a defining goal for much of the world, such as at the OECD and in many trade agreements, as globally interoperable

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<sup>11</sup> Nordas (2016)

<sup>12</sup> Chen et al. (2019)

<sup>13</sup> OECD (2013)

privacy frameworks ensure effective protection of privacy while maintaining the free flow of personal information around the world.

Interoperability starts with domestic policy makers ensuring their legal frameworks make clear that firms with a legal nexus in their jurisdiction are responsible for managing data in a certain way, wherever the data are transferred and stored. In other words, a country's data-protection rules travel with the data. To provide assurances that a country's privacy laws are respected internationally, interoperability is supported via several data-protection initiatives, such as the OECD principles and the APEC Cross-Border Privacy Regime. It can also happen bilaterally, such as through the EU-US Privacy Shield Framework, or through privacy and data flow provisions in trade agreements, such as the CPTPP or the equivalency arrangements under the EU-Japan EPA.

A strong global network of privacy enforcement authorities is needed to complement this effort to build interoperability. To engage internationally, domestic regulators need the resources and mechanisms to work with foreign privacy enforcement counterparts given how a single data privacy incident, such as a data breach, can affect multiple countries. For example, the Global Privacy Enforcement Network was launched in 2010 by the privacy authorities of 12 countries, including the US, Australia, Canada, France, Germany, and the United Kingdom (UK). Another example is the APEC Cross-border Privacy Enforcement Arrangement, which creates a regional framework for information sharing and cooperation on enforcement among privacy regulators.

At the next level below this, privacy regulators can set up bilateral arrangements (such as memoranda of understanding) with counterparts. Countries can then use these enforcement cooperation mechanisms to both share information and best practices and cooperate on joint investigations. Whatever the level, there is clearly a need for more countries to have the capabilities and mechanisms to cooperate with foreign regulators to conduct joint investigations, share findings, and impose penalties on violators, thereby strengthening the hands of regulators globally.

Currently we witness different approaches towards regulating areas such as e-commerce and digital trade. The major policy challenge is to strike an optimal balance between supporting an innovative and competitive digital economy whilst protecting consumer privacy and security. Facilitating e-commerce including cross-border data flows can enable businesses to realise economies of scale and scope, whereas strong consumer privacy rules are likely to create the trusted on-line environment that is arguably a precondition for demand-driven growth.

We call on the G20 to renew efforts to work towards a consensus with regard to these trade-offs, as a set of widely accepted policies would benefit firms and economies around the globe. The urgency of finding common rules is driven by rapid technological advances that e.g. turn watches into activity-recognition systems which can detect, record and recognise human activity in real time. Such developments present unprecedented challenges for regulating trade. The G20 can play a crucial role in leading the way to a policy framework for technologies in the digital age.

## **2. Development strategies to embrace digital opportunities**

Although most of the newly developed and developing countries are not at the very frontier of digital technologies, there is a lot of room for applying them to their economic development. Indeed this process is urgent, with increasing numbers of countries scrambling to adopt new technologies to avoid a 'race to the bottom'; a path of immiserating growth in which they are locked into ever-greater loss of competitiveness and falling incomes. The volatile global economy, uncertainty in the multilateral governance system, and the complexity of the demanding task at hand all serve to highlight the social, economic, and political costs of lagging behind. Addressing the challenges and catching up with

technological shifts requires an urgent and dedicated policy response at both national and international level.

Although the introduction of information technology such as AI, machine learning, and robotics may come a bit slowly, the application of communications technology such as the internet and smartphones has already started. Digitised services utilising such technologies must be explicitly incorporated into development strategies of newly developed and developing countries at least in the following 3 contexts. Furthermore, building an enabling policy environment, especially with an eye towards cross-border digital transactions, will be key to success. For instance, adopting e-signature and e-transactions laws lays the foundations for digital economies to build on.

The first is the use of digitised services to support manufacturing production networks. Newly developed economies, especially in East Asia, Eastern Europe and part of Latin America, are participating in manufacturing production networks, and digitised services including logistics, communication, and professional services are essential to making the operation of such networks stable and efficient. To avoid so-called “reshoring”, these economies must improve their location advantages and reduce services trade costs, by making greater use of digitised services.

The second is the application of modern digitised services to rejuvenate and upgrade traditional industries such as agriculture, fisheries, cottage industries, transportation and tourism. Digitised services provide new opportunities for information gathering, matching between sellers and buyers and access to financial services, substantially enhancing productivity in otherwise declining sectors.

The third is the significance of new digitised services as a contributor to rapid and sustained economic growth. In many developing economies, services industries were often regarded as a retarded, low-productivity part of the economy absorbing redundant labour in the informal sector. More recently, young entrepreneurs have actively participated in digitised services, and start-up companies have been mushrooming. Digitised services will fast become one of the leading industries in generating innovation and fostering human capital.

To assist developing economies take advantage of digitised services to more rapidly reach the SDGs, we recommend, as set out below: new guidelines for digital aid-for-trade, including an enhanced focus on attracting foreign investment to build infrastructure for digital connectivity, both physical and institutional.

## **2.1 Aid-for-trade to bridge the digital divide**

A key message from the 2017 Global Review of Aid-for-Trade was that digital networks are an integral component of global trade, but developing countries need a lot more assistance to maximize the economic and social benefits of digital technologies, while addressing relevant costs and risks<sup>14</sup>. Core to this effort are the basic building blocks, including ICT infrastructure, widely accessible and affordable internet connectivity, digital skills and literacy, and a supportive regulatory framework.

Over the last decade donor countries and regional and multilateral development agencies have focused more attention to helping developing countries use digital technologies for trade and development.<sup>15</sup> However, these plans remain limited in size and scope and supported by only a small

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<sup>14</sup> OECD/WTO (2017)

<sup>15</sup> The ITU participates in the World Summit on the Information Society (WSIS), the Broadband Commission for Digital Development and various “connect” strategies that aim to mobilise human, financial, and technical resources, especially for improved connectivity. The World Bank, after its 2016 World Development Report on Digital Dividends, launched the Digital Development Partnerships (DPP) to help developing countries design and implement digital development strategies. Building on this, the 2021 report will cover “Data for Development.” In 2016, UNCTAD launched its “e trade for all” initiative and readiness assessments, which

number of donors and private sector partners. Very little (less than 5%) of development assistance carried out under the WTO AfT umbrella has been directed to services. Meanwhile of the US\$525 billion multilateral development banks provided to low- and middle-income countries over 2012-2016, less than 1.5% went to ICT projects, with only 5% of this amount going to digital policy development<sup>16</sup>.

Donors need to provide more resources and attention to digital development given the key role it plays in economic growth. We propose a few key principles to ensure that AfT donor support is productive:

1. digital project assessments should be holistic within a broad country- or sector-specific analysis and digital development strategy
2. digital projects should utilise clear governance structures with local leadership, including public and private participation
3. digital projects should be coordinated and targeted at key bottlenecks
4. digital projects should embrace digital trade in using digital goods and services where they already exist, instead of focused on developing high-risk project-specific innovations<sup>17</sup>
5. regional and multilateral agencies should work together to develop digital development templates to use in different sectors to help developing countries speed up their assessments and strategies
6. focus on building infrastructure for digital connectivity, both physical and institutional.

## **2.2. Building infrastructure for digital connectivity**

This is the essence of the development policy response. While the digital divide tends to be narrowing, in terms of internet penetration, to take advantage of digital technologies for economic development, newly developed and developing economies must build up both physical and institutional infrastructure for broader digital connectivity.

Physical infrastructure for digital connectivity centres on access to stable, high-speed and affordable internet connection. In particular, 5G will substantially expand the scope of digital technology applications.. Physical ICT infrastructure involves major investment, but unlike traditional physical infrastructure, the large part of investment can be implemented by the private market including inward direct investment. Access must be ensured for remote and rural communities and small businesses, and some government involvement as well as international collaboration may be necessary to deliver universal services.

To utilise digital technologies and digitised services at full scale, more traditional complementary physical connectivity is also essential. For example, e-commerce for goods must be facilitated by swift and efficient last-mile logistics. E commerce in both goods and services must be facilitated by efficient e payment systems as well as an array of paperless trading innovations such as e-invoicing, e-signatures and e-certifications.

Institutional infrastructure is also important. Most of the newly developed and developing economies have not yet established systemic policy frameworks governing the flow of data and data-related businesses. These range from consumer protection and competition policy issues to more controversial issues such as privacy protection, cybersecurity and digital taxation. In some jurisdictions, restrictions on data flows would seem stronger than necessary to achieve the policy objectives, while the implementation would seem to be too lenient. It is important and urgent for all countries to focus on preparing an efficient best practice policy and regulatory environment for utilising digital technologies.

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helps developing countries quickly identify barriers to e commerce. Aid agencies from the US, EU and UK, among others, have developed digital strategies.

<sup>16</sup> World Wide Web Foundation & the Alliance for Affordable Internet (2018)

<sup>17</sup> See UNCTAD (2018)

## 2.3 Reaching the Sustainable Development Goals (SDGs)

The extensive set of targets set out in the SDGs provide a degree of guidance for countries in terms of 'what' to achieve. But the question of 'how' to achieve these targets, also needs to be addressed. This requires comprehensive examination of individual country capacities and needs and proposals appropriate to their socio-economic status. Some things are nevertheless increasingly clear.

First, developing countries should open further to foreign investment in digital services industries and telecommunications infrastructure. The cost and difficulty of restricting cross-border data flows is considerable and without good internet infrastructure developing countries will be left totally behind. More openness to foreign investment could help to create employment and output as well as deliver digital knowledge spillover.

Second, the application of communications technologies has positive potential implications for inclusiveness. The dissemination and uptake of smartphones has been very quick, with evident positive digital developmental outcomes. In some developing countries, radical new digital policies are being introduced. India, for example, has launched a programme to provide individual ID with biometric authentication for all citizens and is offering bank accounts and cellular phones for all households, to improve efficiency in the delivery of social services. There are potential issues which need to be addressed, such as privacy, but some policy collaboration should be helpful in resolving them.

Thirdly, the COVID-19 crisis is serving to accelerate the digital transformation of the global economy. To avoid widening of the digital divides and marginalisation of low-income countries and SMEs, policy reforms should be directed to better utilisation of existing digital networks and platforms in the short run and preparing the ground for investment in infrastructure in the longer term.

Developed countries should make sure that legitimate concerns about privacy, security, money laundering and piracy do not erect insurmountable barriers for companies in developing countries to sell their products and services over digital platforms. At the same time, developing countries should open their markets to trade, investment and data flows while meeting essential privacy, security and protection of intellectual property standards.

## 3. Upskilling for digital economy job creation

The adoption of digital technologies enabled by services is impacting comparative costs, employment and trade patterns. This is creating opportunities for a broader range of firms to engage in trade and for more people to engage in work from remote and foreign areas, thereby contributing to employment. Digitisation already enables high-skilled services workers in developing countries to telework for firms in other geographic locations. This poses challenges on the other hand for workers with inadequate skills and for those whose functions can become digitally replicated or offshored - an increasingly likely phenomenon. Challenges posed to employment arise, for example, from 3DP, blockchain technology, AI-software handling queries and automation of business processes.

In order for services activities to become the new major source of growth and employment, several policy actions need to be promoted. First, access to talent, including international talent, has become central to services' firms competitiveness. Cross-border mobility of persons is therefore important. Second, it is at least as crucial to improve human capital and skills, including both secondary education and IT skills. In an increasingly servicified and digital global economy, many workers will need social skills such as communication and management skills. In high-skill jobs, employers will increasingly look for employees not only with technical and cognitive skills but also with such social skills<sup>18</sup>.

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<sup>18</sup> Börner et al (2018)



Priority attention must therefore be given to improving human capital and skills attainment through education reform. Empirical evidence shows that a country's level of income reflects the education system outcome. Improving skills, however, is more than just an education system for the future work force as it also requires giving new and upgraded skills to current workers. While these policies are mostly domestic, international cooperation allows sharing of experience and best practices. Digital technologies, and cross-border flows of services and data are likely to become substantially more important for educating the future workforce and continuously upgrading current workforce skills.

Digital transformation is associated with automation of many activities previously performed by workers. There is compelling evidence that this has led in the past to a shift in demand towards high-skilled workers and consequent growing income inequality. However, as services are increasingly drawn into the digital realm, new jobs are emerging with new opportunities for decent work also for middle-skilled workers. While the jobs that create ICT and AI tools tend to be technical skills-intensive, many complementary jobs tend to be intensive in interpersonal skills and empathy. Post COVID-19, the digital economy will offer new opportunities in these areas, not least for women.

#### **4. Stimulating Digital Innovation**

The significant demand and supply shocks taking place in the world economy during 2020 and the associated dramatic decline in global trade and investment flows necessitates a holistic and sustained global response that bridges domestic capability building with global outreach. The COVID-19 health pandemic is a wake-up call requiring governments to act faster and in a more comprehensive manner to address not only the immediate but also the longer term socio-economic challenges both at the national and the international level.

Building more entrepreneurial innovation ecosystems should be seen as an intrinsic part of the global response. Not only would this help countries address the immediate and ongoing domestic challenges of creating employment opportunities and kick-starting renewed economic growth, but it would also enable greater synergy with and responsiveness to open global trade opportunities and greater participation in global value creation.

The G20 has an important role to play this year in helping to sustain entrepreneurship and innovation at the national level and to promote global collaborations between G20 members' innovation ecosystems in support of mitigating the current socio-economic impacts of the health pandemic as well as building a strong platform for rapid recovery of global trade and economic growth as we enter the digital age.

G20 members need to promote collaborations, knowledge exchanges, and value co-creation between national entrepreneurial innovation ecosystems to assist inclusive global recovery from the COVID-19 pandemic. By establishing guiding principles, best practice regulations and standards for these collaborations, the G20 can set the stage for promoting innovative ideas to spur solutions to the public health and other socio-economic challenges.

Countries can catch up with the emerging disruptive technologies and the Fourth Industrial Revolution by building their entrepreneurial capabilities of opportunity recognition and creation. The establishment of entrepreneurial innovation ecosystems would help stakeholders in different sectors to swiftly adapt to emerging technologies through active cooperation and collaboration. Entrepreneurial ecosystems may play an increasingly important role in providing information about digital opportunities and connecting to state-of-the-art technology. By facilitating the flow of information and resources for innovative ideas to spur, entrepreneurial ecosystems would bring the community of creative thinkers, entrepreneurs, investors, public officials, academics, other individuals and organisations together whereby collective problem-solving, adaptive collaboration, and the synergy of continuous learning bring creative, sustainable solutions to our challenges.

National and local governments have a critical role to play in terms of building entrepreneurial innovation ecosystems, incentivising research and development, promoting commercialisation, monitoring the progress and rewarding the success stories. Tax, land, building, rent incentives, easing access to finance, protecting property rights and promoting foreign direct investment and exports are some of the key roles governments can play. At the same time, governments should ensure that ethics and values are embedded in the adoption of digital innovations, as emerging technologies carry both opportunities and risks. governments should also adopt a more adaptive, human-centered, and inclusive “agile” way of policy-making to keep up with the rapid change of digital technologies. Lastly, governments need to work closely with and leverage the expertise of the private sector, as well as civil society, to tackle the challenges together.

In addition to government policies and regulations, ecosystem management and organisational culture is critical in achieving the desired objectives. Companies, universities and research institutes can play an active role in managing their own entrepreneurial innovation ecosystems in collaboration with the public authorities. Building an entrepreneurial innovation ecosystem requires a long-term strategic combination of business goals and financial requirements, an implementation plan covering the systems, processes and platforms underlying the organisational structure, and a shared vision which bonds diverse participants together. These ecosystems need to be adaptive and agile so that they can rapidly adapt to the changing circumstances. This is even more critical during the COVID-19 global pandemic. A continuous improvement/learning-by-doing mindset should be central to the organisational culture. To have global impact in creating an enabling environment for the digital economy, innovation ecosystems must aim to link to global value creation, thereby contributing domestically and internationally to sustainable economic, trade and investment growth.

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