

Introduction





Digital innovations are transforming the global economy. The decline in search and information costs, rapid growth of new products and markets, and emergence of new players ushered in by digital technologies have the promise of boosting global trade flows, including exports from developing countries. At the same time, digital technologies are also threatening privacy and security worldwide, while developing countries that lack the tools to compete in the new digital environment are in danger of being left even further behind. This book from the World Trade Organization (WTO) Chairs, members of the Advisory Board and WTO Secretariat staff examines what the rapid adoption of digital technologies will mean for trade and development and the role that domestic policies and international cooperation can play in creating a more prosperous and inclusive future.

The first section identifies the challenges and opportunities posed by digital technologies to developing countries and the role of international cooperation, whether regionally or in the WTO, in addressing them. The second section discusses how countries in different developing regions view the opportunities and challenges of digital technologies and how policymakers are responding to them. The third section considers examples of how digital advances, for example the growth of e-commerce and the development of blockchain technology, may contribute to inclusive growth. The fourth and final section discusses the role of domestic policies and regional approaches to digital trade and offers some key findings.

Section 1: The digital trade era – challenges and opportunities for developing countries

Innovative digital technologies have considerable potential for boosting developing countries' exports. In Chapter 1, Bekkers, Koopman, Sabbadini and Teh provide an empirical illustration of the potential gains in trade, both globally and for developing countries, from the adoption of robots, greater reliance on artificial intelligence and big datasets, more intensive use of information and communications technology (ICT) services by other sectors of the economy, and the reduction in trade costs because of new digital technologies. They use the WTO Global Trade Model, a recursive, dynamic computable general equilibrium model, to generate simulations showing the impact of technological change on trade. The model compares a scenario showing the impact of digital technologies on 16 sectors, 14 regions and 5 factors of production with a baseline scenario where the pace of technological change is based on past trends. While the accuracy of the point forecasts generated by the model is uncertain, this exercise helps to discipline qualitative projections, takes into account the indirect effects of economic changes and provides some insight into the likely quantitative impacts of new technologies on international trade.

The simulations indicate that digital technologies will have a significant impact on trade. On average, between now and 2030 global trade growth would be 2 percentage points per annum higher, and developing

countries' trade growth 2.5 percentage points per annum higher, as a result of the adoption of digital technologies. Services exports would become a bigger part of global trade, making up more than a quarter of total trade by 2030, while the share of services imports in manufacturing gross output would also rise. These findings run counter to concerns that increased use of robots and 3D printing will result in a reshoring of production to the advanced countries, thus impairing export opportunities for developing countries. If these results are correct, the reduction in trade costs due to digital technology has a larger impact on trade than does the increased opportunities for more closely matching demand owing to proximity to markets and improved efficiency of custom-made production.

Section 2: Strategic directions and policy implications for developing countries

This second section of the book takes a broader policy perspective to analysing the challenges and opportunities that digital technologies offer for developing countries. We have no ambition to provide an exhaustive analysis of the topic, but rather the goal is to select particular countries and issues where the growth of digital technologies is having a marked impact. These country and policy examples hopefully can provide insights that may be applicable to other situations.

Our first example is the analysis by Baghdadi and Guedidi (Chapter 2), who explore an important aspect of how digital technology could improve developing countries' trade prospects

by examining the role of internet technologies in strengthening ties between African economies and global value chains (GVCs). The internet is likely to play an increasingly important role in reducing the time and costs required to trade. Digital platforms and logistics technologies (among others) could reduce search costs by facilitating matching between buyers and sellers, and the use of robotics, artificial intelligence and Internet of Things (IoT) applications could substantially reduce shipping and customs processing time. This reduction in time and costs is a critical issue for participation in GVCs, where goods are traded across borders several times. Access to the internet also can save time and money by facilitating coordination and monitoring across firms in a GVC.

African firms already participate to some extent in GVCs, but African countries' participation in GVCs is largely through supplying inputs (often raw materials) to foreign firms for further processing (referred to as forward participation). African firms play less of a role in backward participation in GVCs, as represented by the share of inputs of foreign origin in a firm's total material inputs. Country-level data from the United Nations Conference on Trade and Development (UNCTAD)-Eora GVC Database and firm-level data from the World Bank's Enterprise Survey are used to measure the relationship between Africa's participation in GVCs and the spread and quality of internet technology on the continent. The authors find that access to the internet and internet infrastructure (represented by the availability of broadband technology) increases the participation by Africans in GVCs, and that internet

connectivity has a stronger influence on forward participation in GVCs than on backward participation. These variables also have a greater impact on forward GVC participation for Africa (both in terms of firm-level and country-level data) than in other regions of the world. An important implication is that improvements in internet infrastructure could have a significant impact on African firms' ability to expand their participation in GVCs.

In his commentary on Chapter 2, Newfarmer provides an overview of the findings and conclusions that internet use and infrastructure are particularly important for "high-tech manufacturing" and "high-tech services" exports in GVCs. Newfarmer points out Dollar's research that "the higher the technology (knowledge) intensity of a sector, the more significant the increase of complex GVC activities" (2019, p. 1). Referring to de Melo and Twum's recent work (2020) and pointing out that, despite efforts of the regional communities (RECs), regional value chains remain only at the early stages of development, Newfarmer suggests further broadening the research agenda on value chains in Africa. By way of example, he notes that regional value chains in the East African Community (EAC) amount to only 1.7 per cent of total gross exports, which stands in stark contrast with the Association of Southeast Asian Nations (ASEAN) (17.2 per cent). He concludes noting that for new technologies to fully translate into increased exports and rising incomes, policies must go beyond internet infrastructure. Trade policy needs to keep pace with communication and digitization policies and, to that end, the African Continental Free Trade Area (AfCFTA) and its efforts to

deepen regional agreements hold enormous promise.

The transactions with GVCs discussed in Chapter 2 have an increasing role in facilitating consumer and business purchases within Africa, and so too does the internet.

In Chapter 3, Seetanah, Padachi, Fauzel, Sannassee and Boodoo discuss the importance of purchases over the internet in Mauritius, which is a leader in e-commerce in Africa. Mauritius has the second highest (after Libya) share of the population making online purchases in Africa. The rise in retail e-commerce was driven by increases in internet use and penetration, coupled with increased credit card use and the development of secure online payment systems. Mauritius also topped the UNCTAD B2C E-commerce Index (e-readiness) for Africa.

Chapter 3 analyses retail customers' perceptions about e-commerce, based on a survey of 250 respondents and a number of in-depth interviews with the top management of 12 Mauritian firms engaged in online shopping across different business sectors. The customer survey revealed high levels of satisfaction with online shopping, due to wider choices, the ability to save time, accessibility and the relative ease of searching for products online. Major concerns included uneasiness over the potential disclosure of personal information and the limited ability to contact vendors. Respondents who have not shopped online cited concerns over navigating online, payment security and high costs. Online sellers expressed considerable optimism over future market growth, but also were concerned about a local

bias towards international websites, technical limitations of internet service and the small market size. Interviews with policymakers cited the strong legal and regulatory framework supporting electronic payments but described a need for stronger regulatory cooperation with other countries on e-commerce, and more work to collect statistics. Technical assistance would be useful in these efforts.

In the commentary on Chapter 3, Hartzenberg explains how government policies have been of critical importance for Mauritius to radically transform and diversify the economy, transforming from a base product economy and preferences to a high-tech hub. Until a few decades ago, Mauritius was a single-crop (cane sugar) exporter to the European Union (under a preferential scheme). Policies are now fully geared towards helping Mauritius become a hub for ICT-related, financial and education services. Government policies are centred on supporting digitally enabled growth and they work: Mauritius tops the rankings for Sub-Saharan Africa, followed by South Africa, Nigeria and Kenya. She then looks deeper into the policies, either considered or already put in place, on the African continent including at the African Union, which put e-commerce on Africa's trade agenda, the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC), focusing on digitalization, e-regulation, e-logistics and e-trade. She also notes that the inclusion of e-commerce on the AfCFTA's agenda has proved to be a contentious matter, with African countries holding different positions on the treatment of e-commerce when it comes to addressing regulatory issues.

The analysis by Kiriti Nganga and Mbithi of the challenges and opportunities afforded by digital trade in Kenya (Chapter 4) confirms that e-commerce has grown rapidly in that country, supported by new legislation and government policies. Laws have been passed to provide a framework for the provision of ICT services, e-commerce transactions, data protection and access to information. The government also has established one-stop shop centres for the delivery of government services to citizens and for trade logistics. The policies outlined in the government's Digital Economy Blueprint provide a solid basis for the expansion of digital trade through the establishment of the AfCFTA.

The growth of digital trade will open up new opportunities for the provision of online services, promote export diversification, boost efficiency and growth in manufacturing, improve competition in the financial sector, increase access to market-relevant information, and increase market access for micro, small and medium-sized enterprises (MSMEs). However, the potential of digital trade is constrained by lack of access to finance, low incomes, limited broadband and fibre coverage, inadequate transport infrastructure and skills gaps. The legal and regulatory framework is insufficient to protect against cybercrime, ensure privacy, support the interoperability of mobile money platforms and banks, promote consumers' trust in online transactions, protect intellectual property and protect digital sites from liability for customers' posts.

“Digital innovations are transforming the global economy.”

Referring to the international literature and findings presented by international organizations, Oulmane and Sadni Jallab, in the commentary on Chapter 4, support the evidence provided by Kiriti Nganga and Mbithi, underscoring that e-commerce is a key factor in achieving the goal of economic development in Africa and specifically in Kenya. E-commerce can promote entrepreneurship, contribute to developing the private sector and creating jobs. It also plays a critical role in connecting to GVCs. Data are provided showing that Africa has a huge potential in digital trade as its young population is growing very rapidly and engages heavily in this mode of producing and consuming. Africa faces considerable challenges in pursuing digital trade policies and has a low level of internet penetration compared to that of other countries. Also, most African countries have weak infrastructure. In order to advance digital trade in Africa, regulatory systems need to be developed further not

only at the national level, but equally at the regional level. The AfCFTA plays a critical role and so do international institutions such as the United Nations Economic Commission for Africa (UNECA).

In Chapter 5, Igue, Alinsato and Agadjihouédé analyse the potential for e-commerce activities in Africa. The share of the African population with internet access has increased rapidly in recent years, and the continent's share of global internet connections has risen. The rapid growth of internet penetration and in the use of mobile telephony, the

development of mobile money services, the increased use of credit cards and increased access to bank accounts have greatly boosted financial inclusion and encouraged reliance on electronic payments, thus establishing a strong basis for e-commerce development. Online payments or purchases increased by 240 per cent from 2014–2017 in Africa, compared to only doubling in Asia and smaller rises in Europe and the United States. Firms, including small and medium-sized enterprises (SMEs), have boosted their internet presence in terms of the number of websites and use of e-mail. Nevertheless, Africa accounted for less than 2 per cent of global e-commerce transactions in 2017.

Several factors constrain e-commerce on the continent. Cybercrime continues to have a large impact on Africa: about 80 per cent of African computers are infected by viruses or malware. Moreover, the legal framework to combat cybercrime is inadequate in many countries. More broadly, most African countries lack many of the basic requirements of a legal framework for e-commerce, for example, laws providing for the acceptance of electronic signatures and adequate consumer protection, while in many countries the legal/regulatory framework has several defects, including high tax levels and a lack of clarity on regulatory policies. Despite progress, the share of the population with a bank account remains low, which limits consumers' ability to pay for goods purchased online. The cross-country harmonization of rules required for cross-border e-commerce is also lacking. Reducing cybercrime, increasing participation in the financial sector and strengthening the legal

framework are key steps to promoting e-commerce activities.

Noting that African nations will likely not generate the huge number of new jobs needed to match their population growth, Sauvé, in his commentary on Chapter 5, argues that a robust African digital economy will require deeper regional cooperation, the pooling of resources and information sharing on emerging best practices across several key areas. These include a solid digital infrastructure, digital literacy and skills, digital financial services and digital platforms, as well as digital entrepreneurship and innovation. These efforts need to be paired with building a solid set of trade rules, but they will not suffice alone. Based on how rule-making in other areas has gradually evolved, he suggests taking a closer look at various regional trade agreements (RTAs) and preferential arrangements, which offer many useful and relevant insights on how to negotiate rules for digital trade.

As Sauvé argues, digitization presents a number of novel regulatory challenges for trade rule-makers that stem in no small measure from the increasingly blurred distinction between goods and services and the resulting uncertainty as to the applicable trade rules. In the absence of globally agreed norms on digital trade, he also believes that preferential trade agreements (PTAs) can serve as laboratories in which to experiment with – and adopt – elements of a nascent regulatory regime governing electronic transactions and digital trade. The AfCFTA features a built-in negotiating agenda on e-commerce and digital trade, providing African countries with a ready-made setting in which to design a Pan-African digital

strategy and action plan aimed at accelerating the development and regulatory sophistication of continent's digital ecosystem and enhancing the volume of digitally enhanced cross-border transactions.

In Chapter 6, Jiang, Zhang and Jin discuss the recent history and the policy framework for e-commerce transactions in China. The dollar value of e-commerce transactions in China has increased enormously over the past 20 years, shifting from mostly business-to-business transactions in the late 1990s to the rapid development of customer-to-customer transactions beginning in 2000 (although the market was plagued by defects in logistical support and counterfeit goods) and achievement of a mature market by 2015, with rapid growth of internet users and logistics firms, along with increasing reliance on mobile phones. Since 2016, the growth in e-commerce transactions appears to have levelled off, while logistics and after-sales services have improved. Most e-commerce transactions concern manufacturing, as well as wholesale and retail trade. The market is characterized by increasing diversity, for example, the growth of e-medical services, the expansion of cross-border e-commerce, the rapid growth of social e-commerce and the development of online-offline transactions. However, the level of e-commerce development declines as one moves from east to west, which is closely related to the level of economic development and degree of marketization in each region.

Both the government and the private sector have played important roles in e-commerce development. Key supports have included improved

infrastructure, the rapid growth of mobile telephony, increased financing (particularly equity investment), the provision of rapid logistics services, the availability of a user-friendly internet platform and effective market regulation based on international agreements. China's national government has elaborated on e-commerce policies through five-year plans, while regional governments have also participated in planning and in adjusting the e-commerce policy framework in light of local conditions.

Building on the analysis presented by Jiang, Zhang and Jin, Ye, in the commentary on Chapter 6, provides more evidence and data on the rapid growth of e-commerce transactions and the transformative effects they have had on the global economy. China has significantly contributed to that development in the past 20 years, and it has become one of the largest e-commerce markets in the world. There are many cross-border e-commerce market players in China, including e-platforms, e-payment operators, e-vendors, warehousing operators and express shippers that jointly operationalize considerable numbers of online transactions and offline deliveries on a day-to-day basis. This process has been strongly supported by government policies and, in June 2015, the Chinese government rolled out its strategy to foster cross-border e-commerce in a policy document. This leads Ye to suggest that countries should benefit from the lessons learned in China in terms of devising digital policy strategies. Also, she advocates for coordination and rule-making at the international level.

In Chapter 7, Arfani, Hapsari and Perdana explore the structural and

practical issues that confronted the adoption of Indonesia's e-commerce roadmap (2017–2019). The roadmap focuses on eight key issues in the development of e-commerce: funding (focusing on start-ups and SMEs), taxation (including lowering some rates and easing procedures for small ventures), consumer protection (strengthening regulation and developing a National Payment Gateway), education and human resources (a national e-commerce awareness campaign and education programs for all stakeholders), logistics (strengthening courier companies and developing rural to urban logistics routes), communications (national broadband development), cybersecurity (establishment of a national surveillance and e-commerce monitoring system, provision of education on e-commerce cyberthreats and standardized data collection) and managerial issues (establishment of an operating management structure for the e-commerce roadmap). Implementation of the roadmap has faced difficulties, including (i) delays in executing laws and regulations; (ii) the failure to adequately address some key issues, including privacy protection and how technological innovations that provide for anonymity have facilitated illegal transactions; and (iii) the lack of a comprehensive treatment of data collection.

The authors propose two major categories of issues in order to identify problems and challenges confronted by stakeholders. The structural category concerns the larger governance context of the country's digital economy and includes laws and regulations, the institutional setting and implementing phases, which involve socio- and political economic

interplays among key players. The second category represents practical issues that affect the digital economy. The authors present two cases to illustrate efforts by stakeholders to resolve disagreements on policy, including Indonesia's position on the WTO moratorium on e-commerce and local initiatives (such as the one in the city of Yogyakarta) to develop the digital economy.

In the commentary on Chapter 7, Olarreaga observes that the comparative disadvantage Indonesia and other countries have on electronically transmitted goods and services is mainly due to the lack of a strong infrastructure that is needed to support the digital sector. Low internet e-commerce and credit card penetration and problems with postal services are hard barriers to overcome when trying to increase the competitiveness of electronically transmitted goods and services. He goes on to argue that problems should always be solved at the root, rather than applying secondary policies. The first best solution for addressing low internet penetration is to address the source rather than using secondary policies such as trade-distorting taxes. Not only are they costly and inefficient, they cannot substitute for first best solutions. He suggests alternative ways of funding policies geared towards better internet, e-commerce and credit card penetration, and postal services, and which consist of issuing government bonds, or, if that option is not available, other and less distortive border taxes, including land taxes, sales taxes, VAT and taxes on firms' profits.

Pogorletskiy and Sutyrin discuss the taxation of e-commerce in Russia in

Chapter 8. The e-commerce sector is small, but its potential for growth is enormous. Thus, tax rates on e-commerce in Russia should remain moderate, given the sector's small size (so the rise in tax revenues from higher rates would be small) and substantial growth prospects (so future tax revenues from a developed sector could be quite large). Russian authorities are establishing effective automated systems for collecting taxes and customs duties on cross-border e-commerce, calculating VAT compensation to exporters and accounting for receipts in online stores. These systems will help to prevent abuse of the tax system, as well as reduce the cost of compliance by firms.

The Russian taxation of e-commerce activities presents two important challenges. First, consumer goods purchased directly from foreign online sellers enjoy significant tax advantages compared to imports purchased in Russian retail outlets, undermining the profitability of Russian importers and reducing tax revenues. Second, the VAT levied on foreign exporters of electronic services creates uncertainty because the legal definition of electronic services is unclear and impedes the operations of multinational companies in Russia because VAT is taxed on intra-firm imports of services.

In the commentary on Chapter 8, van Gorp notes that traditional tax systems need to be reviewed because the taxation issues of e-trade are more complex and demand new frameworks for fair taxation while at the same time allowing enough room for innovation. She considers Russia an interesting case because the country's budget suffers from tax losses reflected in

the fact that despite the growing significance of e-trade as a portion of overall international trade, the fiscal effect of its taxation on national budgets is insignificant. She supports the proposition by the authors to focus on the stimulating role of taxes in international trade rather than on increasing the collection of taxes whereby the emphasis on customs duties and excises is more important for visible goods, while for e-services and products, import VAT becomes more important.

Improving the efficiency of trade logistics is a key element of reducing trade costs, promoting global and regional trade and supporting the expansion of e-commerce. In Chapter 9, Awad-Warrad, Boughanmi and Hwang compare the quality of logistics services in Jordan, Oman and Hong Kong, China, from the point of view of their ability to support increased e-commerce transactions. The logistics sector plays an important role in supporting the growth of e-commerce in all three economies. Each has also established legal frameworks for ICT-related transactions. While the logistics infrastructure is stronger in Jordan and Oman than in many other countries in the Middle East and North Africa, the quality of logistics services in these countries remains well short of the level in Hong Kong, China. The share of the population with internet access in Hong Kong, China, is somewhat above that of Oman and Jordan. However, Hong Kong, China, consistently rates among the top 10 to 15 economies in terms of the framework supporting business-to-consumer e-commerce, logistics services and ICT development, while Oman is ranked around the top third and Jordan around the middle or lower in most

indicators surveyed in the chapter. And export costs, and to a smaller extent import costs, are much lower in Hong Kong, China, than in Jordan or Oman.

In the commentary on Chapter 9 and based on a review of the literature, Sarris supports the findings by Awad-Warrad, Boughanmi and Hwang on the role of improvements in trade logistics performance in the form of cost and time to export. One aspect of the new international economy is the proliferation of value chains, with products and services that are intermediate inputs to a final product going through many countries or many times through the borders of one country before reaching final assembly. This suggests that the longer the product value chain the higher the proportion of final product value that can be affected by border measures. It follows that the reduction in trade costs, via increases in efficiency of trade procedures, could expand the length of a given value chain, by reducing the costs of extra steps in the chain. This in turn could reduce obstacles for many SMEs to enter some segments of the value chain, and hence increase the production and trade opportunities for such firms. Countries with large improvements in trade facilitation will thus have more chances of entering long GVCs.

The lack of a WTO agreement has shifted responsibility for ensuring the free flow of digital trade to regional and bilateral trade agreements, while the growth of e-commerce has increased the importance of clear rules in this area for Latin American governments. In Chapter 10, López, Condon and Muñoz consider the new rules on digital trade in RTAs recently negotiated by Latin American

economies. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the United States-Mexico-Canada Free Trade Agreement (USMCA) are among the most advanced regional agreements that cover the regulation of digital trade, particularly in the key areas of privacy, access to information and data flows. The CPTPP includes a comprehensive set of new digital trade rules that involves a binding commitment to allow the free flow of data, prohibits data localization requirements that could impede market entry, permits the use of all devices on the internet and requires all groups to adopt privacy protection regulations.

While the USMCA incorporates many provisions of the CPTPP, there are important differences between the two. For example, both agreements provide for the free transmission of information. However, the two agreements have a slightly different balance between the rights of governments to regulate cross-border data flows in the public interest and the rights of big data to engage in cross-border data mining that facilitates the development of new technologies, particularly those based on artificial intelligence. Thus, the lack of multilateral rules on the free flow of data has resulted in divergent approaches in RTAs.

According to Medhora's commentary on Chapter 10, there are two areas where the seeming technocratic e-commerce-related provisions of the USMCA mask deeper and more sensitive issues of power and national sovereignty. One is data localization, and the other is the capacity of national authorities to hold multinational digital platforms accountable for the content they carry. He points to the current

discussions on how best to manage content on digital platforms and where the challenges consist of balancing safety with freedom of speech. This tension is reflected in the regional approaches as opposed to multilateralism. As he points out, RTAs were traditionally used as “hot houses” in which policy approaches were tried before moving to the multilateral sphere. However, he notes that it is equally possible that RTAs act as a ratcheting mechanism, locking norms and practices negotiated by powerful players that stand to become a multilateral standard.

In Chapter 11, Thorstensen and Delich consider the challenges facing regulation of e-commerce by comparing the domestic regulatory provisions of Argentina and Brazil, along with their participation in negotiations of agreements on e-commerce regulation through the Southern Common Market (MERCOSUR) and the WTO. The value of e-commerce transactions is growing rapidly in Argentina and Brazil, and in both countries the share of the population participating in e-commerce transactions exceeds the Latin American average. Both countries have established a legal framework for data protection, regulation of the internet, consumer protection, taxation of e-commerce, and contracts and e-signatures. Argentina and Brazil also have submitted proposals for negotiations over the treatment of e-commerce transactions in WTO agreements, and included e-commerce provisions in free trade agreements.

However, different approaches to internal regulation of e-commerce and differences in positions in international negotiations indicate diverging

regulatory approaches that will increase legal uncertainty and thus constrain investments and market expansion in the sector. An exception is the regulation of data protection, where both Argentina and Brazil are following principles laid out in the European Union’s General Data Protection Regulation (GDPR). Further negotiations between the two countries over regulatory convergence for e-commerce could best be undertaken through MERCOSUR.

In his commentary on Chapter 11, Wu notes that both countries have sought to engage digital trade on their own terms. He highlights the three important contributions made by the authors that help us better understand the development of e-commerce in Argentina and Brazil: (i) the importance of robust regulatory reform; (ii) the role of participation in external processes in influencing internal developments; and (iii) the fact that both countries pushed domestic regulatory reforms on their own terms, without necessarily seeking regional harmonization. On this last point, there is a real concern that the lack of a single digital market in MERCOSUR will prevent regional firms from acquiring the scale economies necessary to become competitive globally. This raises the question of whether Argentina and Brazil are bound to continue as success stories. Both countries dropped in the UNCTAD B2C E-commerce Index rankings. Concluding on a more optimistic note and as digital competition is just beginning, the vital lesson to be drawn is that investing in legal reform and active participation in multilateral institutions can only get a developing country so far. In order to compete against advanced economies and

emerging Asian giants, developing countries need to invest heavily in human capital, stabilize macroeconomic conditions and achieve regional scale economies.

Nurse considers the policy issues raised by the use of digital technology in developing countries' "creative sectors", including, for example, entertainment (TV, movies, videos, games), visual arts, books, newspapers and magazines, advertising and architecture (Chapter 12). The creative sector is an important source of growth in the global economy, as personal, recreational and audio-visual services have expanded as a share of the expenses of the average household. Firms operating in the creative sector have been the fastest adopters of online and digital technologies. Digital creative trade has increased sharply in recent years and developing countries' share of the sector has risen. Digital content is replacing physical goods in the sector, for example, in music, books and gaming; copyright collections from digital sources are rising as a share of global collections (although digital collections remain small); and creative content accounts for a significant share of e-commerce, as well as content on mobile networks, the internet and blockchains.

Participation in the creative sector by developing countries appears to be increasing, although data availability is poor. The copyright sector contributes a substantial share of gross domestic product (GDP) and employment in several developing countries. To reap the potential benefits of creative industries, developing countries need to improve the quality and marketability of their content. The enhanced

integration of developing countries' creative industries in GVCs requires a shift in the industrial paradigm and business practice from the typical low value-added, standalone creative firm, cultural practitioner or artist operating in isolation to higher levels of collaboration, coordination and organization, along with a comprehensive approach to sectoral support. Key policy measures should include a stronger legal framework for creative industries (in particular improved copyright protection), reductions in tariff rates on the import of machinery that supports creative industries, financial support for the commercialization of creative activities, government involvement in business support services (e.g. training, incubators, innovation labs, market incubators, cluster development and market development programmes), the creation of enabling institutions to represent the interests of creative workers and firms, the generation of data on creative markets, and the harmonization of government policies towards the sector.

Meier-Ewert, in his commentary on Chapter 12, takes the point further, considering that the development of effective collective copyright management organizations (CMOs) is an important contribution to a functioning intellectual property (IP) system and is needed particularly in developing countries to ensure viability and financing of the creative sector. He argues that development and adaptation of the copyright system to the challenges of the modern digital world are required. Digital communication technologies have enabled global markets for digital products, whereas licences to use IP-protected content are granted on

a territorial basis and related IP rights are covered by domestic law. The paradigm shift in the significance of IP systems for the global digital marketplace creates a particular urgency in the area of copyright. A concentration of efforts in the development of an internationally compatible modern and responsive system of law and institutions in the area of IP is likely to be an excellent investment in the future opportunities of creative industries in developed and developing countries alike.

Section 3: Making the most of the digital trade era – inclusiveness, gender and development

Parry, Jansen van Rensburg, Viviers and Orkoh consider whether the growth of the digital economy is consistent with further progress in inclusive growth (Chapter 13). Concern is growing over the rise of inequality in many countries, driven by differences in opportunities to develop human capital, international trade and technological progress. Digital technology can provide new opportunities to disadvantaged groups but can also exacerbate inequality and limit inclusiveness. Developed-country policymakers tend to stress the importance of the free transmission of data across borders, while some developing-country policymakers have advocated for a digital industrialization strategy to limit competition from large technology firms to encourage the growth of local digital capabilities.

The spread of the internet and other new technologies (artificial intelligence, robotics, the IoT and 3D printing) has generated challenges for employment, particularly for the poor, the

unemployed, women, people with disabilities, minority ethnic groups, and the small businesses operated by these groups. Nevertheless, digital technologies – particularly e-commerce – may hold promise for marginalized groups by increasing access to marketing and financial transactions; boosting services sectors, where many women are employed; providing youth with information about entrepreneurial possibilities, knowledge and skills; and helping small businesses compete with larger establishments by linking to suppliers or partners, and finding and communicating with the market. A cross-country study finds a positive correlation between internet usage and digital trade in goods and services, on the one hand, and a reduction in vulnerable employment, on the other. In addition, there is a positive correlation between greater internet usage and life expectancy. Perhaps the use of digital technologies in recent years has improved healthcare services.

Policies to use digital technologies to improve inclusive growth include improving the availability of data, solving the issue of uneven digital connectivity, establishing an effective regulatory framework for digital developments and data flows, upgrading education and skills training, and designing a digital trade policy that is appropriate for the level of income and inclusivity.

Building on the analysis by Parry, Jansen van Rensburg, Viviers and Orkoh, Piermartini, in her commentary on Chapter 13, stresses the role that trade policy can play in creating the right environment for a country to seize the opportunities that digital

technologies provide and to attract investment. This not only includes goods-related trade policy measures such as lower tariffs on IT products, but it also includes digital trade policy that fosters data exchanges and allows for the harmonization of e-certificates. Trade policies related to services sectors, such as finance, distribution, logistics and transport, are also key determinants for a

country to reap the benefits of digital technologies. She offers three main arguments in support of strengthening international cooperation to make digital technologies more inclusive, specifically that international cooperation: (i) may help to tackle the potential negative impact of digitalization on competition, resulting from market dominance (monopoly) by leading operators; (ii) may address the issue of data availability; and finally, (iii) may help to resolve some of the tensions generated by uncoordinated unilateral approaches to digitalization ("digital protectionism" or simply unnecessarily divergence). She feels that at the multilateral level, the WTO negotiations and joint initiatives related to services, electronic commerce and MSMEs can help deliver a more inclusive digital development. One policy that can contribute to bridging the digital divide is by making further commitments under the General Agreement on Trade in Services (GATS). This could be a way to enhance policy credibility and thereby help attract foreign direct investment.

In Chapter 14, Bahri focuses on how blockchain, a kind of electronic

"International cooperation is essential for realizing the full potential of digital technologies."

bookkeeping that enables a list of encrypted transactions (known as a ledger) to be stored in a decentralized

manner, can help women in overcoming barriers to trade. Blockchain technology could significantly lower the cost of cross-border payments, security trading and compliance, while its anonymity and efficiency could enable many women, who otherwise would be constrained by law,

custom or high costs, to engage in financial and business transactions. For example, blockchain could be used to enable women who lack identification documents to undertake transactions that otherwise would require official identification (as, for example, through IDbox), which would facilitate women's access to finance and their ability to effect financial transactions (as, for example, under a joint programme with UN Women and the World Food Programme assisting women in Jordan), and to prove their ownership of assets without interventions from male family members (as in a World Bank pilot project in Viet Nam). Blockchain can help MSMEs, more than 30 per cent of which are owned by women, to overcome costs associated with exporting and importing, and interact easily with consumers, other businesses engaged in the supply chain, customs officers and regulatory bodies. Blockchain also can increase women farmers' access to information on crops and market conditions (as in the UN "Buy from Women" initiative), thus improving their bargaining position.

However, if not regulated properly, the expanded use of blockchain also could increase the relative return to sophisticated technology skills (for example, understanding of how to operate a blockchain-based mobile application, how to initiate a smart contract, or how to create, save or access documents) that men are more likely to have, and thus might erect even higher barriers to trade for women. Many regulatory agencies are either trying to catch up with this rapidly evolving technology or are in a major state of disagreement about the value blockchain adds to the ecosystem of international trade. This lack of regulation and the differences in country regulations create uncertainty that could impede the use of blockchain for the economic empowerment of women. The WTO could play a key role in developing guidelines for the use of blockchain in international trade to support the efficient and inclusive adoption of blockchain technology.

Analysing the channels discussed by Bahri and through which blockchain can empower women, Ganne writes in her commentary on Chapter 14 that blockchain can be a powerful tool to remove frictions from international trade and promote women's access to international markets but realizing the full potential of blockchain will require more than merely the technology. It will require political will and action to allow interoperability of blockchain platforms and to create a regulatory framework that is conducive to the large-scale deployment of the technology. It will also require addressing the digital divide through investment in physical ICT infrastructure and IT education for women. Women's access to the internet and ownership of digital

devices remain significantly lower than men's and tech-related jobs remain male-dominated. This is also true for blockchain. Multilateral organizations have a key role to play in helping address these issues and turn blockchain's potential for women into reality. Women's blockchain networks, such as Global Women in Blockchain and African Women in Blockchain, which assist women and help them seize the opportunities that this new technology opens are welcome developments that will, no doubt, contribute to making blockchain work for women's economic empowerment.

Section 4: the ways forward

Building on the analysis offered in the earlier sections of the book, Section 4 provides forward-looking perspectives. Gao (Chapter 15) provides a succinct yet thought-provoking analysis on data regulation in trade agreements. He starts by highlighting the important role played by data in national economy and international trade, which also explains the rush to regulate data both domestically and internationally. This is not an easy exercise as it involves balancing the conflicting interests of three main groups of stakeholders, i.e. the individual, the firm and the state. With the growing popularity of provisions on data regulation in trade agreements, we start to see the emergence of three different approaches, with each of the three main traders in the world – China, the European Union and the United States – each championing a different model. After summarizing the differences between the three, this chapter explores the reasons for them, and Gao argues that they are mainly driven by different commercial interests

and regulatory philosophies. It concludes by providing some practical suggestions on how to move the discussions on data regulation forward as part of ongoing negotiations on digital trade among WTO members.

In Chapter 16, Smeets explains that while perspectives differ as to how governments can create an enabling environment and establish the right conditions at the national, regional and global levels in support of digitalization and with a view of their fuller integration in world trade, the views tend to converge on several specific requirements that need to be fulfilled in order to take full advantage of the opportunities offered in the new digital trade era. This includes focusing more strongly on specific services sectors, strengthening infrastructure to facilitate digital trade and further reducing transaction costs, all of which are elements conducive to a better linking to GVCs. These findings and the examples presented by the Chairs are supported by analysis conducted by the leading institutions, including the WTO: digital trade can play a significant role in supporting inclusive economic growth and enhancing the development perspectives of developing countries. The findings not only contribute to a fuller understanding of the complex digital trade issues affecting competition, they facilitate a better appreciation of the challenges that remain in designing policies for the future. In order to facilitate digital trade, governments have a significant role to play domestically, regardless of what will or can be agreed multilaterally on regulating digital trade. International trade is increasingly determined by an enabling environment created by countries at the national level, i.e.

domestically. Of critical importance is the need to put the right infrastructure in place and to facilitate IT and digital trade, thus allowing a better connection to markets and linking to the GVC. This requires adequate domestic regulatory systems as well as harmonization and coordination of such policies at the international level.

The analysis presented in the book leads to some main conclusions. While the various chapters in this volume discuss a wide variety of issues and focus on different country and regional examples, some common themes emerged. First, many of the authors share considerable optimism about the impact of digital technologies, such as the internet, blockchain, artificial intelligence and other uses of ICT services. The further adoption of digital technologies is expected to increase developing countries' trade, in part by facilitating connections to GVCs. E-commerce transactions have grown rapidly (examples are provided of China, Kenya and Mauritius, as well as regional data on Africa), and the reliability and variety of goods and services have increased markedly.

Absent any government intervention, the impact of digital technology on vulnerable and marginalized groups is less clear. On the one hand, improved access to information and lower-cost communications through the internet can help level the playing field for small producers and assist new entrants to the labour force in finding jobs. And blockchain technology holds considerable promise for enabling women to increase their participation in financial and business transactions. On the other hand, the increasing importance

of digital technologies is raising the returns to sophisticated skills that individuals from higher-income backgrounds (and men) are more likely to possess.

The chapters show a broad consensus on the critical role that policy plays in supporting the adoption of digital technologies and ensuring that vulnerable groups are not left behind. High levels of access, high-quality infrastructure that supports the internet and mobile telephony, and solid transport and postal services are essential for e-commerce. Realizing the full potential of digital technologies will also require governments to address the digital divide (in infrastructure and skills) within their own country, between men and women, urban and rural areas, rich and poor. A strong legal and regulatory framework is critical for the efficient adoption of digital technologies and to improve their contribution to inclusive growth. Some essential provisions are directly concerned

with digital technologies, for example, the regulation of data flows, protection of privacy on the web, the control of cybercrime and legal recognition of digital signatures. Others concern both the internet and the analogue economies, including IP rights, consumer protection, the financial system and business support services.

Finally, international cooperation is essential for realizing the full potential of digital technologies. Differences in legal and regulatory provisions across countries create uncertainty over the validity of transactions, which constrains investment and business operations in the sector. The need for international rules to regulate data flows has led governments to introduce specific provisions in RTAs, with the consequent risk of a fragmented regulatory environment. The internet has brought us closer together, for both good and ill. International cooperation is essential to reap the maximum benefits while limiting the costs.