



**Asia-Pacific
Economic Cooperation**

APEC Economic Policy Report 2019

Structural Reform and the Digital Economy

NOTE:

The terms “national”, “nation” used in the text are for purposes of this report and do not imply the “political status” of any APEC member economy.

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PREFACE

In recent years APEC has stepped up its efforts to help members to address the opportunities and challenges of the digital economy. In 2017 APEC adopted the APEC Internet and Digital Economy Roadmap and the E-commerce Facilitation Framework, and in 2018 a new body (the Digital Economy Steering Group) was formed to coordinate APEC's digital economy work. In 2019, and for the second year in a row, advancing APEC's work in the area digital economy is a major host year priority. This year's APEC Economic Policy Report (AEPR) on Structural Reform and the Digital Economy aims to contribute to APEC's accelerating digital economy work.

The introduction to the 2019 AEPR highlights key concepts, opportunities and challenges, including the need to accurately measure the digital economy. The main section outlines ways to apply core market-enhancing structural reforms to the digital economy, with specific reference to the financial and other sectors. The third section describes holistic policy approaches, including ways to harness structural reforms alongside supporting policies to promote greater inclusion with respect to the digital economy.

Policymakers and regulators struggle to keep up with fast-changing technologies and cross-border trade patterns. APEC is the ideal forum to discuss and develop innovative and effective structural reforms to promote digital economy development in the Asia-Pacific region. In this connection, the EC has very recently endorsed, on a pilot basis, the APEC Collaborative Framework for Online Dispute Resolution of Cross-Border Business to Business Disputes, and will seek collaboration with member economies and other fora on its implementation.

Following last year's success, this year's AEPR is another joint effort of the Economic Committee (EC) and Senior Finance Officials under the Finance Ministers' Process (FMP). Member economies contributed to the 2019 AEPR through the Individual Economy Report questionnaires and by serving on the core team responsible for preparing the report. A number of economies provided pertinent case studies or helpful suggestions to improve the report. We are also utterly grateful for the generous funding provided by Australia and New Zealand for this year's report.

We would like to express our gratitude to Chile for leading the core team, which consisted of members from: Australia, Canada, China, Indonesia, Japan, Mexico, New Zealand, Russia, Chinese Taipei, Thailand, the United States and Viet Nam. We also thank the APEC Secretariat for its valuable advice and assistance and the APEC Policy Support Unit, which had worked tirelessly in writing and managing the overall production of the report. We would like to acknowledge the substantive contributions provided by the Organisation for Economic Co-Operation and Development (OECD), as well as its support in peer-reviewing the report.

We sincerely hope that the information and recommendations in the 2019 AEPR will help APEC members to take advantages of the economic opportunities and tackle the challenges presented by the fast-changing digital economy over the coming years. As digitalization and new technologies transform the global economy, it will be critical to adopt a holistic and collaborative approach. This year's report aims to provide APEC members, fora and external partners with concrete ideas to promote sustainable digital economy development.

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EXECUTIVE SUMMARY

Opportunities and challenges in the digital economy

- APEC economies have different interests and priorities with regard to the digital economy. Due to its complex and multifaceted nature, it is challenging for APEC economies to agree on a single overarching definition of the digital economy. However, the present lack of consensus on a clear and specific definition should not prevent APEC from moving forward with work on the digital economy. Indeed, APEC fora are already devising workplans to address digital economy challenges, and developing strategies to measure various aspects of the digital economy, based on the APEC Internet and Digital Economy Roadmap.
- In terms of opportunities, digital technology and tools are enabling the development of many new business models that disrupt traditional practices. Besides creating entirely new businesses and industries, digital technology and tools have brought benefits to traditional firms and individuals alike. For example, e-commerce has created an additional channel for firms of all sizes to market their products. While data analytics is arguably not a new phenomenon, advances in ICT have lowered the price of broadband subscriptions in many economies, as well as the cost of collecting and using data on a large scale. Firms now have greater connectivity and access to new ways of handling and deriving insights from data, turning it into yet another determinant of a firm's competitiveness.
- Just as the digital economy provides numerous opportunities, it presents significant challenges for policymakers, businesses and individuals. While data drive innovation and provide more opportunities, some fear that the increasing dependence of businesses and economies on data can result in data protection issues with potentially massive damage to the economy and consumer trust. The digital economy has made intellectual property rights (IPR) protection more pertinent, but also more challenging.
- Universal, reliable and affordable access to information and communications technology (ICT) is essential to participate in the digital economy. Although more people can now access the internet and related technologies, there remain variation in access between and within economies. Furthermore, despite transactions being increasingly digitally-enabled, a significant proportion of products especially goods are yet to be digitally delivered. Access to reliable and resilient infrastructure such as roads are equally important to ICT, yet economies have often underinvested in them.
- The digital economy has also led to the creation of new kinds of employment but these jobs require individuals to have the right skills. While some digital economy jobs do not require advanced ICT skills and provide more flexibility, there is a risk that such employment is creating a precarious class of on-demand or independent workers.
- Maximising the opportunities of the digital economy while overcoming its challenges require economies to take critical steps both in terms of measurement and structural reforms.

Measuring the digital economy

- Statistics and indicators play an important role in evidence-based policymaking. Clear measurement frameworks, coupled with regularly updated and comparable data across economies and time can provide policymakers with a good overview of different areas relevant to the digital economy.

However, measurement of various aspects of the digital economy is still a work in progress for many reasons.

- Definition and measurement go hand-in-hand. Definition provides the scope of coverage and allows statisticians to come up with a corresponding measurement framework, but reaching consensus among different stakeholders is not an easy endeavour. Lack of an agreed definition leads to different measurement frameworks, and affects the comparability of statistics between economies and across years.
- Definition aside, there are various challenges related to the technicalities of measurement itself that further complicate the process of establishing a feasible measurement framework. These include the lack of congruence between the System of National Accounts (SNA) framework and emerging features of the digital economy, and correspondingly, inadequacies with existing measures such as gross domestic product (GDP); difficulties in measuring services; barriers related to the sharing of available data; and the varying capacity of economies at different stages of development to collect data.
- Although it is important to accurately measure digital and digitally-facilitated flows,¹ it is equally important to measure digital transformation because it allows policymakers to better understand how digitalisation is changing the economy and society as a whole and devise appropriate policy responses. On this front, gaps and challenges remain despite efforts by economies and various organisations in collecting and analysing indicators to monitor the digital transformation.
- The advent of the digital economy has brought with it new business models that have fundamentally changed the way that business is conducted and the products and services that are being traded. It is important that policies and regulations with implications for the digital economy are monitored.

Core structural reforms in the digital economy

- Broadly understood, structural reforms remove structural barriers to improving access to economic opportunity. Core structural reforms undertaken by the Economic Committee include those pertaining to competition policy and law, regulatory reform, ease of doing business and public sector governance. Each of these reforms can be applied to the digital economy opportunities and challenges.
- Competition policy is one of the most critical of the structural reform areas for the digital economy. For instance, in the telecommunications sector, which represents the backbone infrastructure for delivering digital economy products and services, increased competition could lead to reduced prices and improved regional coverage. Up-to-date competition policies could also facilitate new market entrants and the uptake of new business models, while helping to ensure that digital technologies and tools are not exploited to the detriment of competition.
- While technologies and business models are evolving rapidly, policies have had difficulty keeping up with the pace of change. Complicating the situation is the different rates at which governments from around the world have been responding to the digital economy as well as the distinct approaches they have taken on similar issues. This suggests that APEC economies may wish to redouble their regulatory reform efforts to minimise the burdens on digital participants to the extent

¹ For the purpose of the AEPR, 'digital and digitally-facilitated flows' includes, but are not limited to electronically-delivered goods or services, other types of data flows, and goods sold via e-commerce channels.

possible and increase international regulatory cooperation to ensure greater standardisation and alignment of digital economy policies.

- Efforts to promote ease of doing business are also important for businesses and entrepreneurs to reap the benefits of the digital economy. Despite laudable efforts by economies, more can be done to ensure that the business environment evolves together with the changing economy. Furthermore, although digital technology and tools have facilitated (i.e., digitally-enabled) transactions, a significant share of products are not digitally delivered. In fact, the digital economy has led to a boom in e-commerce and the consequent movement of small parcels across borders. While e-commerce is only one example, this shows that for the digital economy to operate efficiently, it is also important to address issues related to cross-border trade.
- Governments can play an important role in charting the direction of the digital economy by applying digital technology and tools to improve public sector governance in various areas. They can also use them to enhance policy design, experimentation, implementation, monitoring and evaluation. In addition to harnessing technology and tools to improve their own services, governments can act as an agent of change by encouraging their increased use among the private sector and society as a whole. However, even as governments increasingly employ a range of technologies and tools, it is important that policymakers do not underestimate the risks and become over-reliant on them.

Supplementing structural reforms

- While advancements in new technologies and business models have led to more opportunities, industrialised and developing APEC economies have seen a downward trend in welfare to labour over time (in terms of growth in labour productivity and share of labour compensation in GDP). This indicates that inequality is increasing in the region.
- The digital economy can have a range of impacts on inclusion, such as: (1) reduction in job and employment opportunities due to automation; (2) lack of skills for the new digital economy jobs among the population; (3) lack of access to infrastructure such as broadband internet to take advantage of the opportunities in the digital economy; (4) lack of technological diffusion to a larger number of firms; and (5) lack of access to social protection in the new gig/sharing economy jobs.
- Recognising that core structural reforms constitute only one aspect of structural-reform related work and should be complemented with other policies, the Economic Committee produced a document in 2018 proposing three approaches that economies may take to better harness structural reform to tackle complex challenges such as inclusive growth. This can entail: (1) making core structural reforms pro-inclusive; (2) undertaking structural reforms in specific areas to generate positive externalities such as human capital development, infrastructure and social security; and (3) ensuring that core structural reforms are aligned with other types of reforms and supporting policies.
- These approaches are applied in the seven areas that are at the intersection between the digital economy and inclusion, namely, human capital development; social protection; infrastructure; fiscal policy; innovation; micro, small and medium enterprises (MSMEs); and gender.
- In the area of human capital development, for example, economies are encouraged to: (1) apply holistic policy frameworks which align structural reforms with supporting policies such as training and other programmes for unemployed workers; (2) provide avenues for lifelong learning; (3) ensure education systems evolve with the needs of the digital economy; (4) complement classroom-based education with alternatives such as online courses; and (5) allow technical skills to be acquired through work-shadowing and apprenticeship programmes.

- In the area of social protection, economies can consider: (1) complementing traditional social programmes with universal social protection based on need rather than employment conditions and earnings; (2) expanding employment-related programmes to include other non-standard employment forms; and (3) providing a variety of protection to workers in the digital economy.

Optimising structural reforms

- Structural reforms need to be optimised to ensure their continued relevance. Prior to embarking on structural reform efforts, it is critical for economies to establish a baseline and identify their plans moving forward. Economies may wish to conduct a stocktake of those of their policies that are relevant to the digital economy to better understand the current gaps and challenges.
- It is important for economies to recognise that implementing structural reforms is a process and not a one-off activity. Therefore, economies should ensure that policies and regulations are regularly reviewed and updated, particularly in light of the ever-shifting challenges posed by the digital economy.
- When implementing policies, policymakers need to ensure that they are well-coordinated, coherent and complementary to one another. This necessitates that policymakers reach across traditional policy silos as well as across different ministries and levels of government to develop an integrated, whole-of-government approach to policymaking.
- Although policies may be well-intended and targeted, achieving the desired outcome is not a given and could be affected by issues such as delivery mechanisms and resource availability. Communication is key to ensuring that all stakeholders understand how proposed policies and regulations will affect them and that they can access relevant information. Economies would also need to build monitoring and evaluation activities into the policymaking process.

Policy recommendations

- Based on the report's analysis and bearing in mind their differing circumstances and levels of development, APEC economies can consider to:
 - 1. Progress toward agreed definition(s) and clear measurement frameworks for the digital economy.** Definitions delineate the scope of coverage and allow statisticians to develop a corresponding measurement framework. Having baseline measures and data that can be tracked will also allow policymakers to determine if policy objectives have been met or if adjustments should be made.
 - 2. Develop and agree on policy-relevant indicators.** Besides measuring digital flows, it is important to monitor the pace of digital transformation. This will allow policymakers to better understand how digitalisation is changing the economy and to devise appropriate policy responses. It is also important to monitor policies and regulations that have implications on the digital economy.
 - 3. Get core structural reforms right with respect to the digital economy.** Core structural reforms in areas such as competition policy and law; regulatory reform; ease of doing business; and public sector governance can be applied to the digital economy's opportunities and challenges.

- 4. Supplement core structural reforms.** The digital economy can impact inclusion across different areas, including destroying jobs and disrupting entire sectors of the economy. To promote inclusive growth, this report recommends two approaches from the Economic Committee's document on 'Structural Reforms for Inclusive Growth: Three Approaches', namely: (1) make structural reforms pro-inclusive by targeting areas such as education and skills, infrastructure and social security (approach II); and (2) implement supporting policies alongside core structural reforms (approach III).
- 5. Adopt a holistic approach to structural reforms for the digital economy.** When implementing structural reforms and supporting policies, policymakers need to ensure they are well-coordinated, coherent and that they complement one another. For the digital economy to work seamlessly, it is important for economies to approach policy issues and objectives in a holistic rather than in a piecemeal manner. There is thus potential for greater cooperation on digital economy issues between APEC fora and the APEC Business Advisory Council.
- 6. Monitor trends and developments in the digital economy, including policy reforms, and adapt accordingly.** The digital economy is relatively new and in constant flux. Structural reforms and supporting policies that work today may no longer be appropriate in one to two years. Therefore, they should be continuously reviewed along with the trends and developments in the digital economy.
- 7. Leverage and contribute to regional cooperation.** Regional organisations such as APEC and their component fora can play an important role in facilitating discussion and knowledge sharing on best practices and innovative regulatory approaches to the emerging technologies and business models. APEC is also well-placed to serve as a platform for identifying opportunities presented by the digital economy and advance progress on particular initiatives for cross-border collaboration. To avoid duplication and reinventing the wheel, APEC's regional cooperation efforts should refer to relevant digital economy work of international organisations.

INTRODUCTION

The Asia Pacific Economic Cooperation (APEC) forum recognised the importance of the digital economy including e-commerce in linking its member economies as early as two decades ago. In the 1998 Declaration, APEC Leaders commended the APEC Blueprint for Action on Electronic Commerce which sets out principles for the promotion and development of e-commerce in the region. In line with the increasing importance of the digital economy, interest in regional and global cooperation in this area remains strong. In the 2017 Declaration, APEC Leaders indicated that they would work together to realise the potential of the internet and the digital economy, and welcomed the adoption of the APEC Internet and Digital Economy Roadmap (AIDER) and the APEC Cross-Border E-commerce Facilitation Framework. In 2018, under the Chairmanship of Papua New Guinea, APEC Leaders welcomed the establishment of the Digital Economy Steering Group (DESG), a new governance mechanism to monitor and report progress made in the implementation of focus areas identified in AIDER to Senior Officials. Under Chile's Chairmanship this year, the digital society is one of the main priorities of APEC 2019.

The 2019 APEC Economic Policy Report (AEPR) on Structural Reform and the Digital Economy aims to contribute to this work. It includes the following parts:

- **Part 1** provides an overview of the digital economy, including its opportunities and challenges. It also presents a summary of the issues in measuring the digital economy and provides a brief overview of how structural reforms could enable economies to maximise opportunities in this emerging and dynamic area/field while overcoming the challenges of the digital economy.
- **Part 2** presents a more detailed discussion of structural reforms and the digital economy, with a focus on the role of core structural reforms (i.e., competition policy, regulatory reform, public sector governance and ease of doing business).
- **Part 3** presents the role of structural reforms and the importance of holistic policy approaches in ensuring inclusion in the digital economy. It discusses the need to ensure that core structural reforms are pro-inclusive and extend beyond core structural reforms into areas such as human capital development, infrastructure and social protection.
- **Part 4** provides a summary of key points from Individual Economy Report (IER) questionnaires and a stocktake of major APEC initiatives on the digital economy.
- **Annex A** provides a more detailed write-up on the challenges in measuring the digital economy.
- **Annex B** presents the Individual Economy Report (IER) questionnaires completed by APEC economies.
- **Annex C** presents case studies provided by APEC economies.

This 2019 AEPR is the second joint report by the APEC Economic Committee (EC) and the Finance Ministers' Process (FMP) following the 2018 AEPR on Structural Reform and Infrastructure. It represents the continued collaboration between the two fora on similar priorities. This report is aligned with a priority area of the FMP, namely boosting integration in financial markets through the digital economy. Meanwhile, for the EC, this initiative supports APEC's structural reform agenda. Overall, the report aims to contribute to some of the key focus areas of the AIDER, and lays the foundation for APEC's future digital economy work.

PART 1: DEFINITIONS, PRIORITIES AND MEASUREMENT OF THE DIGITAL ECONOMY

The digital and internet economy and new technologies, tools and business models made possible by digitalisation² have disrupted old models and opened up new opportunities for innovation and growth such as:

- The digitisation of books, music, and movies that facilitates the fast spread of content in the form of downloads and streaming.
- Cloud computing, which enables flexible, on-demand access to a range of computing resources.
- The internet of things (IoT),³ which involves sensors and communications links embedded in many devices and objects that greatly facilitate maintenance and repair services.
- Artificial intelligence (AI), which can be deployed to help doctors to detect, track and treat diseases.
- Blockchain, which can be used to enhance transparency, trust and security in the provision of financial services.
- Online marketplaces that provide both micro, small and medium-sized enterprises (MSMEs) and established companies wider reach for their products.
- Social media networks that have revolutionised advertising and marketing.

This digital transformation has had a profound effect on the global economy. In early 2019, Forbes estimated that at least 18 of the world's top 100 largest public companies were high technology or digital economy firms.⁴ It is all the more remarkable that these changes have occurred in the last few decades and show no sign of slowing down.

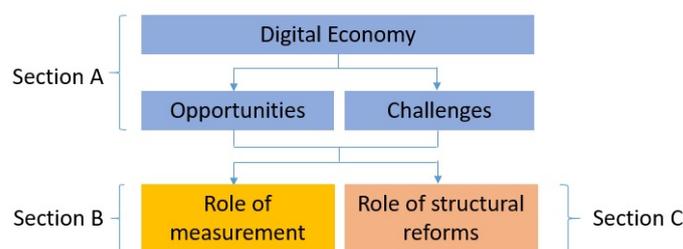
Part 1 of the 2019 APEC Economic Policy Report (AEPR) provides a bird's eye view of the digital economy (see Figure 1.1). Section A has an overview and discusses opportunities and challenges related to the digital economy. Section B discusses measurement of the digital economy, and Section C presents a brief overview of how structural reforms can be applied to the digital economy's challenges. It also describes a holistic approach to implementing structural reforms that seeks to capitalise on the opportunities of the digital economy while addressing and mitigating social and economic challenges. As a regional cooperation forum whose members make up 38 percent of the global population and 60 percent of the global gross domestic product (GDP),⁵ APEC is in a good position to lead on work in these areas, such as through coordinating digital economy policies, sharing best practices and engaging in capacity-building activities.

² According to the Organisation for Economic Co-operation and Development (OECD), digital transformation is a combined effect of digitisation and digitalisation. Digitisation is the 'conversion of analogue data and processes into a machine-readable format'. Examples include tabulating physical copies of data into spreadsheets and converting content like music, books, and games into digital format. Digitalisation refers to the 'use of digital technologies and data as well as interconnection that results in new or changes to existing activities'. These include, but are not limited to, e-commerce via the internet, sharing data and information via web services, and automation of processes (see OECD, *Going Digital: Shaping Policies, Improving Lives* (Paris: OECD, 2019), <https://doi.org/10.1787/978OECD.9264312012-en>). Despite the attempt to differentiate the two terms, they continue to be used interchangeably in the literature. Accordingly, the two terms will be used interchangeably in this report.

³ IoT is the expansion of internet connectivity to devices, hence allowing them to communicate and interact with each other, and also to be remotely monitored and controlled.

⁴ '2019 Global 2000: The World's Largest Public Companies', *Forbes*, accessed 30 May 2019, <https://www.forbes.com/global2000/list/>.

⁵ APEC Policy Support Unit, 'APEC in Charts 2018' (Singapore: APEC, November 2018), <https://www.apec.org/Publications/2018/11/APEC-in-Charts-2018>.

Figure 1.1. Structure of chapter

Source: APEC Policy Support Unit.

A. Background on the digital economy and scope of the report

Overview and definition of the digital economy

Definitions of the digital economy vary widely. Tapscott, credited with coining the term ‘digital economy’, described it broadly as a new economy wherein ‘information in all its forms becomes digital – reduced to bits stored in computers and racing at the speed of light across networks’.⁶ Massive amounts of information previously stored in physical form (e.g., cash, cheques, invoices, photographs, and maps) could now be packaged into byte-sized digital ones and zeroes. While digitisation is already becoming ubiquitous, the current state of the economy is arguably still far from Tapscott’s ideal definition – not everything is digital. Rather, in the current economy, old and new, physical and digital complement one another. As such, it might be more useful to analyse the digital economy as a dynamic sector of the mainstream economy with implications for other sectors of the economy such as manufacturing and financial sector.⁷

To provide a structured accounting framework for the digital economy, Mesenbourg proposed that the digital economy be defined by three principal components, namely: (1) electronic business (e-business) infrastructure; (2) e-business processes; and (3) electronic commerce (e-commerce) transactions.⁸ E-business infrastructure refers to the hardware, software, information and communications technology (ICT) services, and human capital that power and maintain the digital economy, including computers, software (such as operating systems), support services, and human programmers. E-business processes refer to the processes business organisations conduct over computer-mediated networks, such as online procurement, electronic payments, teleconferencing, and management systems. Lastly, e-commerce transactions capture the value of goods and services transacted over computer-mediated networks, such as the purchase of a book or CD over the internet.

A.T. Kearney, on the other hand, applied a value chain perspective, breaking down the internet ecosystem into five main clusters (see Figure 1.2).⁹ The first cluster covers content rights, which include

⁶ Don Tapscott, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (New York: McGraw-Hill, 1996), quoted in: International Labour Organization, ‘Preparing the Future of Work We Want: The Digital Economy and Labour Skills and Competences’ (19th American Regional Meeting, Panama, 2–5 October 2018), https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_644863.pdf.

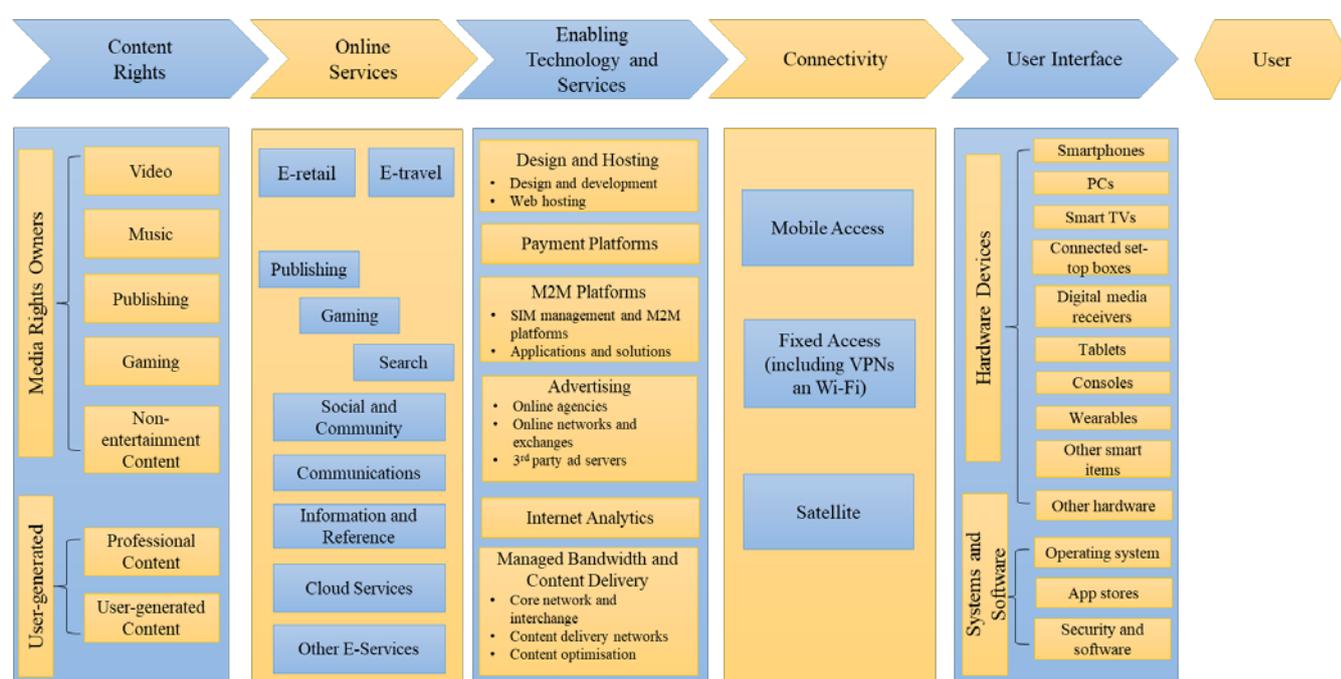
⁷ Daniel Newman, ‘Top 7 Digital Transformation Trends in Financial Services for 2019’, *Forbes*, <https://www.forbes.com/sites/danielnewman/2019/01/16/top-7-digital-transformation-trends-in-financial-services-for-2019/#383eac015310>; Stephen Ezell, ‘Why Manufacturing Digitalization Matters and How Countries Are Supporting It’ (Information Technology and Innovation Foundation, April 2018), <http://www2.itif.org/2018-manufacturing-digitalization.pdf>

⁸ Thomas L. Mesenbourg, ‘Measuring the Digital Economy’ (Suitland, MD: US Bureau of the Census, 2001), <https://www.census.gov/content/dam/Census/library/working-papers/2001/econ/umdigital.pdf>.

⁹ A.T. Kearney, ‘Internet Value Chain Economics: Gaining a Deeper Understanding of the Internet Economy’ (London: A.T. Kearney, May 2010), <https://www.atkearney.com/documents/10192/178350/internet-value-chain-economics.pdf/bd910b2c-bdae-4d6f-8903-f5edad6784eb>.

copyright and media rights to movies, music and books as well as rights associated with content generated by users in digitally-enabled platforms. The next cluster pertains to online services such as e-commerce providers, including e-retail services (e.g., Amazon, MercadoLibre and Rakuten) and e-travel services (e.g., Expedia and Agoda); on-demand content like movies, music, books, and games (e.g., Netflix, Line Music, Storytel and Steam); and search engines (e.g., Google and Baidu). The third cluster includes those providing enabling technology and services like web-hosting and e-retail management (e.g., Alibaba Cloud and Shopify); billing and payment platforms (e.g., Mastercard, Samsung Pay and Yandex.Money); and advertising services. The fourth cluster comprises those providing connectivity infrastructure such as ICT and network providers (e.g., Globe, Telus and Viettel); and services associated with ICT facilities (e.g., satellites and signal towers). The final cluster consists of user interfaces such as the devices (e.g., Asus, Huawei and Samsung) and applications (e.g., App Store and Nintendo eShop) that consumers use to access the internet and associated services.

Figure 1.2. Internet value chain: A framework for measuring value in the digital economy



Source: Adapted from A.T. Kearney, 'Internet Value Chain Economics: Gaining a Deeper Understanding of the Internet Economy' (London: A.T. Kearney, May 2010), <https://www.atkearney.com/documents/10192/178350/internet-value-chain-economics.pdf/bd910b2c-bdae-4d6f-8903-f5edad6784eb>.

Many international organisations such as the International Monetary Fund (IMF), the World Bank, the Organisation for Economic Cooperation and Development (OECD), the World Trade Organization (WTO), the World Economic Forum (WEF) and the G20 have ongoing digital-economy work programmes. The IMF notes that the digital economy could be defined both narrowly and broadly. The former refers to 'online platforms, and activities that owe their existence to such platforms', and the latter covers 'all activities that use digitized data', which arguably could refer to the entire economy.¹⁰ To the World Bank, the digital economy represents a new paradigm of accelerated economic development based on real-time data exchange. It notes the prominent role of online platforms and data in such an economy.¹¹ The Osaka Declaration on Digital Economy, adopted in June 2019 during the

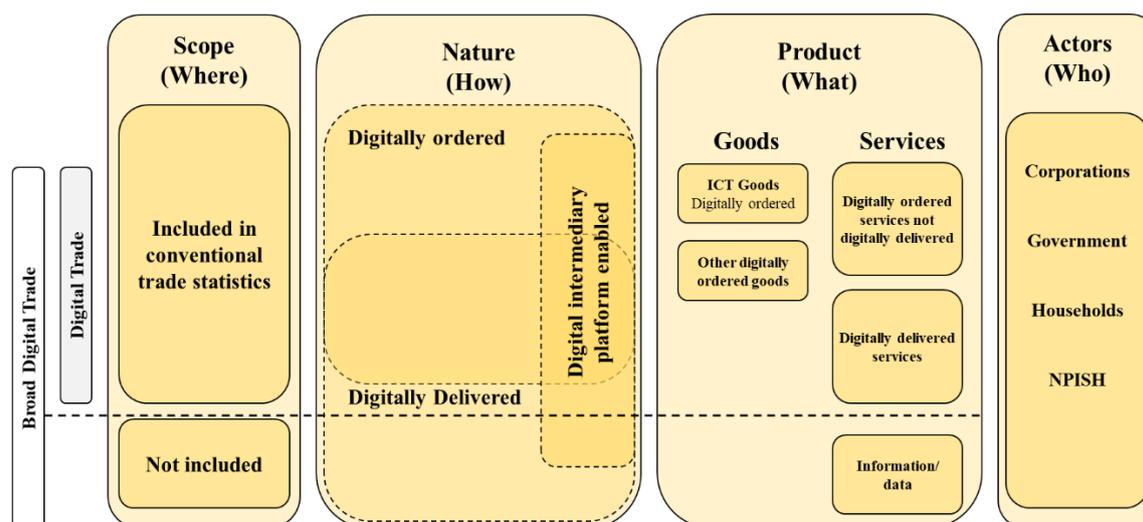
¹⁰ Marshall Reinsdorf and Gabriel Quirós, 'Measuring the Digital Economy' (Washington, DC: IMF, 28 February 2018), <https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/04/03/022818-measuring-the-digital-economy>.

¹¹ World Bank, 'Digital Economy Concept, Trends and Visions: Towards a Future-Proof Strategy' (discussion paper presented at *Developing the Digital Economy in Russia*, Moscow, Russia, 20 December 2016), <http://pubdocs.worldbank.org/en/513361482271099284/Digital-Economy-Russia-Discussion-paper-2016-12-20-eng.pdf>.

G20 Osaka Summit, affirmed the importance of promoting domestic and international policy discussions for harnessing the full potential of data and the digital economy to foster innovation. This will allow economies to keep pace with the fast-growing digital economy and maximise the benefits of digitalisation and emerging technologies.

The digital economy can also be seen through the lens of ‘digital trade’. In March 2019, the OECD and WTO convened a joint working group on international trade in goods and services statistics to formalise a conceptual framework for digital trade (see Figure 1.3). It defines digital trade as ‘all trade that is digitally ordered and/or digitally delivered’ and depicts the different elements of digital trade by demonstrating the nature of the transaction (‘how’), the product (‘what’) and the parties (‘who’) (e.g., producers and users).¹² More importantly, it lists data and information as a key and distinct product traded in the digital economy. It also categorises three main non-exclusive modes of transaction in the digital economy – digitally ordered, digitally delivered, and digital intermediary platform enabled. Digitally ordered transactions cover the sale or purchase of goods and services conducted over computer networks. For example, purchases of books via the publishers’ website would be categorised as digitally ordered transactions. Digitally delivered transactions would include services and data flows delivered digitally as downloads for consumers, such as to e-books, music and software. Finally, digital intermediated transactions are those facilitated by intermediaries which include online e-commerce platforms (but without the platforms taking economic ownership of the goods or services being sold).

Figure 1.3. OECD-WTO conceptual framework for digital trade



NPISH=non-profit institutions serving households

Source: OECD and WTO, ‘OECD-WTO Handbook on Measuring Digital Trade’, (SDD/CSSP/WPTGS(2019)4, Paris: OECD, 2019),

[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=SDD/CSSP/WPTGS\(2019\)4&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=SDD/CSSP/WPTGS(2019)4&docLanguage=En).

Despite substantial progress, we are in the early stages of conceptualising the digital economy. First, the digital economy is relatively new and in constant flux. Second, as technology and online tools/platforms play a greater role in our daily lives and the economy as a whole, it becomes more difficult to distinguish between the digital and non-digital economy. For example, if an individual purchases a T-shirt from a physical shop after watching an advertisement on YouTube, how should this transaction be categorised? What if someone sees an item at an online shop but then decides to purchase it from the same company at a shopping centre down the road? One group of people will contend that it should be part of the non-digital economy since it is neither digitally ordered nor digitally delivered,

¹² OECD and World Trade Organization (WTO), ‘OECD-WTO Handbook on Measuring Digital Trade’ (SDD/CSSP/WPTGS(2019)4, Paris: OECD, 2019),

[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=SDD/CSSP/WPTGS\(2019\)4&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=SDD/CSSP/WPTGS(2019)4&docLanguage=En).

while another group will argue that it should be part of the digital economy since digital content (i.e., the advertisement and the items listed in the online shop) played a role in the purchase.

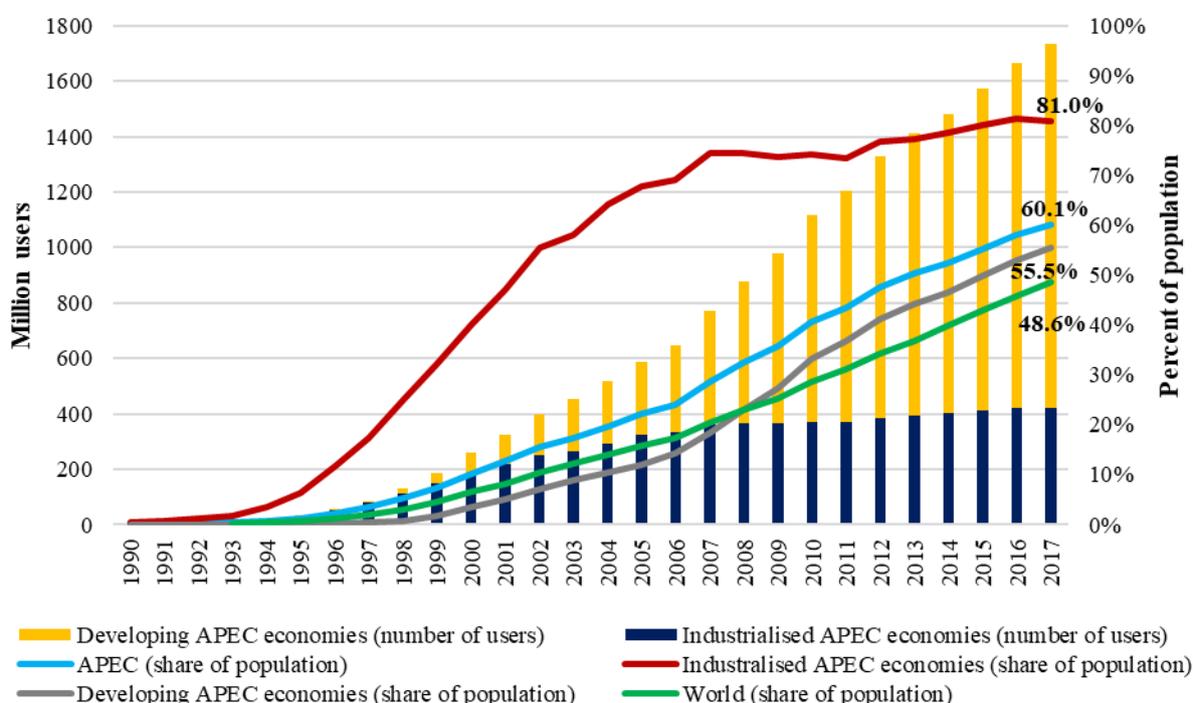
In addition to disagreements on the precise definition and scope of the digital economy, there are technical issues that make it difficult to accurately measure the digital economy under most definitions and scopes, including the narrow ones. These technical issues (to be discussed in more detail in section B) include the extent to which the current production frontier is capturing various facets of the digital economy (e.g., valuation of data and ‘free’ services), the types of statistics collected and the level of aggregation at which statistics are available.

As APEC economies have different interests and priorities with regard to the digital economy and due to its complex and multifaceted nature, it is challenging for APEC economies to agree on a single overarching definition of the digital economy. That said, APEC fora are already devising workplans to address digital economy challenges and developing strategies to measure various aspects of the digital economy, based on the AIDER. The report aims to contribute to APEC’s efforts in that direction.

Opportunities in the digital economy

The present lack of consensus on a clear/specific definition should not prevent APEC from moving forward with work on the digital economy, which is now an important part of the broader economy of the Asia-Pacific region. As seen in Figure 1.4, access to the internet, the gateway to the digital economy, is growing, with the number of internet users in APEC having increased significantly between 1990 and 2017 (from approximately 2.2 million to 1.7 billion). In 2017, 60.1 percent of APEC’s population had internet access, compared to 0.1 percent in 1990. In contrast, the share of world’s population having internet access in 2017 is relatively lower (48.6 percent).

Figure 1.4. Internet users (million and percent of population), 1990–2017

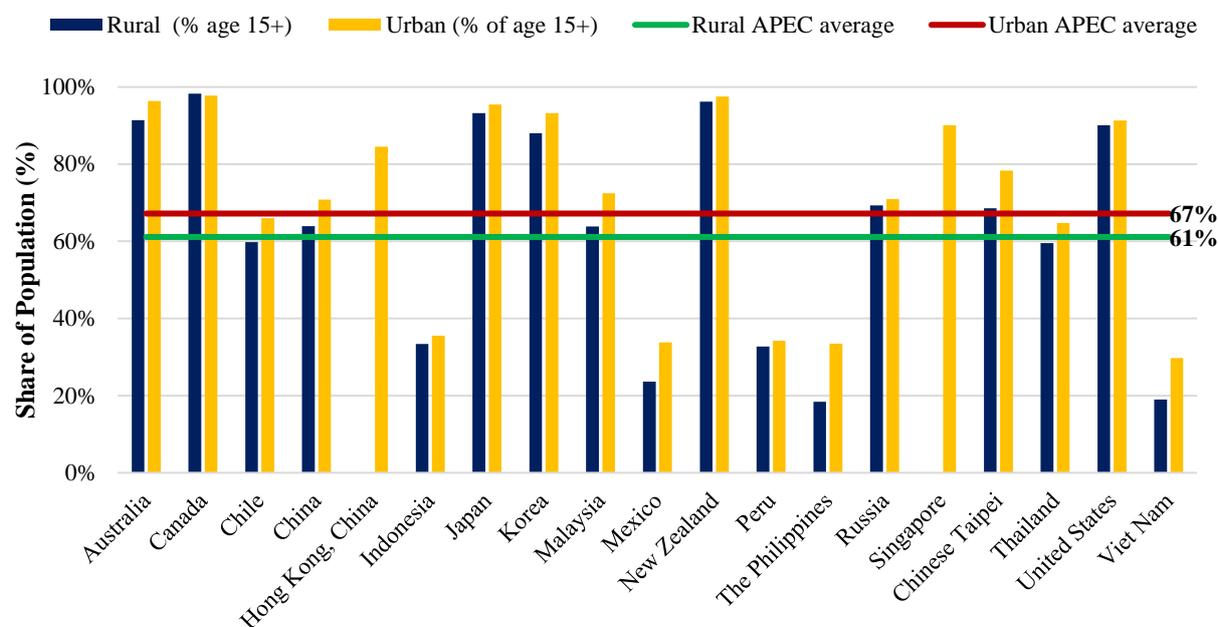


Note: Data are based on surveys generally carried out by statistical offices or estimated based on imputations models which take into account variables such as the number of fixed and mobile-broadband subscriptions and gross national income (GNI) per capita.

Source: International Telecommunication Union; World Bank, World Development Indicators; APEC Policy Support Unit calculations

In 2017, an average of 67 percent of the urban and 61 percent of the rural population in APEC had the capacity to make or receive digital payments, a key enabler of e-commerce and the internationalisation of MSMEs (Figure 1.5). Growing internet penetration and the increasing adoption of digital payment services are just two examples of the growing impact of the digital revolution in the APEC region.

Figure 1.5. Share of population making digital payments in rural and urban areas (percent), 2017



Note: Data for Brunei Darussalam and Papua New Guinea were unavailable. There was no rural data for Singapore and Hong Kong, China since official sources have reported no rural population.

Source: APEC Policy Support Unit, 'APEC in Charts 2018' (Singapore: APEC, 2018).

1. New business models

Digital technologies and tools enable the development of many new business models that disrupt traditional practices. In this section we will describe three models. The **first** model is based on the substitution of existing products or services, enabled by digitalisation. Until recently, books, magazines and maps were only available in physical form. However, the ability to digitally deliver them means that publishers technically do not have to print physical copies anymore, hence saving on costs related to printing and storage among others. In return, they are able to sell written/digital products to readers at a fraction of the cost of physical copies, hence potentially increasing demand. In fact, some products such as maps are no longer circulated in the form of booklets, whether physical or digital. Consumers now use applications such as Google Maps and Waze which are updated regularly (and in some cases, in real time) to find directions.

The same can be said for movies, music and software. While they were previously stored in physical media such as cassettes, CDs and DVDs, firms can now digitally deliver them, rendering many physical storage devices obsolete. Indeed, new firms such as AnimeLab, Netflix, Line Music and Spotify offer subscribers access to licensed content without the need to purchase ownership rights. Google is investing heavily in Stadia (see Box 1.1.), a video game platform that uses cloud computing technology

and is still in development.¹³ Harnessing these new models, customers can access specific songs or games without buying them. In the case of software, customers can receive regular updates and remote maintenance services as necessary.

A **second** model involves digital services that by-pass traditional channels and reduce costs for end-users. For example, although funds transfer used to be within the purview of traditional financial institutions, many financial technology (commonly shortened to fintech) firms have emerged to offer such services at a fraction of the cost due to their lower overhead expenses. This includes firms that provide crowd-funding services and offer borrowers an alternative to bank financing such as Kickstarter and RocketHub. Likewise, one can now purchase insurance and airline tickets directly instead of going through insurance agents and travel agencies. FWD and DirectAsia are examples of direct insurance providers, while many airlines now allow travellers to buy customised tickets directly from platforms such as Expedia or Traveloka.

Firms that leverage new technologies such as cloud computing represent a **third** new digitally-enabled business model. Instead of buying and maintaining their own servers, which may be costly, businesses can subscribe to cloud services provided by firms such as Alibaba Cloud, Google Cloud, Amazon Web Services and Microsoft Azure. In addition to reducing fixed costs, this model gives firms the flexibility of adjusting their subscription based on their needs. They can also benefit from features that provide protection against hackers and cyberattacks, and enterprise solutions offered by major cloud services providers, including database management, data analytics, web hosting and various human resources applications. While some of these services would have been prohibitive for MSMEs previously, they have become available for a reasonable cost under this model. Box 1.1. provides more detailed examples of firms employing these new business models.

Box 1.1. Examples of firms with new business models in APEC

AnimeLab (Australia and New Zealand)

Business model: Goods and service substitution

AnimeLab is a video on demand service launched in 2014 in Australia and New Zealand. Like Netflix and Spotify, AnimeLab provides its clients access to a wide range of media content via streaming. Instead of requiring clients to purchase ownership rights to personal copies of video products (in the form of CDs, DVDs and digital files), AnimeLab allows its clients to stream video media at their own convenience, provided that they have access to the internet. While AnimeLab does not have some services already offered by their competitors such as offline viewing, it distinguishes itself by partnering with Japanese production companies to offer simultaneous broadcasts (simulcasts) of premieres, and exclusive content. Furthermore, AnimeLab provides differentiated subscriptions to diversify its revenue streams: free users can have access to video products, albeit with lower picture and audio quality as well as commercial advertisements, while premium users can access high-definition streams with no advertisements. As of 2018, AnimeLab has reached 1 million subscribers, and is looking to expand overseas.

TNG Wallet (Hong Kong, China)

Business model: Bypassing traditional platforms

In traditional money transfers, clients would typically need to go to a registered remittance agent, fill in a lot of paperwork, and pay substantial fees to process the transfer. While remittances are ideally deposited to bank accounts, access to banking is limited for some communities in developing economies. As such, transferred money would need to be collected at registered brokers, who often charge costly service fees for the transfer. TNG Wallet, launched in 2015, is a Fintech startup in Hong Kong, China. It aims to streamline the remittance process by leveraging technology to cut down

¹³ Mark Knapp, Gerald Lynch and Vic Hood, 'Stadia: Everything You Need to Know about Google's Game-Streaming Service', *TechRadar*, 28 June 2019, <https://www.techradar.com/news/stadia-everything-you-need-to-know-about-googles-game-streaming-service>.

on the number of intermediaries involved in money transfers. Its global remittance service covers over a thousand banks and financial institutions in Hong Kong, China and 16 other economies including Indonesia, the Philippines and Viet Nam. Users can buy 16 different foreign currencies at real-time, competitive rates on the app and the transaction time for a remittance can take as short as 15 minutes. Users are also able to pick up the cash at a chosen outlet in the economies covered by the service. Besides global remittance services, TNG wallet provides other financial services such as electronic payments, global cash withdrawal and settlement as well as wealth management.

Google Stadia (United States)

Business model: Digitally-enabled businesses

First tested in October 2018, Google Stadia is a cloud gaming service scheduled for launch in November 2019. As computational power improved, so had the ability of game developers to create more visually appealing and realistic games; and more powerful machines had been needed to run those games. Thus, for the past 30 years, entertainment companies such as Sony, Nintendo and Microsoft had developed ever more powerful gaming consoles (PS1 to PS4, Gamecube to Switch, Xbox to Xbox One). Consumers first purchase these gaming consoles, and then purchase the games (often stored in a proprietary disk or digital format) to enjoy the product. Google is challenging this model with Stadia. Unlike traditional streaming services, Stadia does not provide a subscription to video games; rather, Stadia provides a subscription to a cloud computing service, which allows subscribers to harness the computational power of a cloud computer and use it as a cloud gaming console. Subscribers to the service still need to purchase individual games to support the game developers. Nonetheless, this model makes the video game market more accessible to consumers as the fixed cost of a gaming console is substantially reduced, allowing them to purchase more games. While Stadia is still in development, it is likely to revolutionise the gaming industry.

Sources:

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2. Wider opportunities at lower costs

Besides creating entirely new businesses and industries, digital technologies and tools have brought benefits to traditional firms and individuals. This section describes some of these opportunities. E-commerce, for example, has created an additional channel for firms of all sizes to market their products. A study by the eBay Public Policy Lab found that almost all of eBay's registered online sellers in selected APEC economies are able to export globally, compared to a relatively small percentage of MSMEs using offline channels.¹⁴ Another study noted that firms are able to reach an average of 30

¹⁴ eBay Public Policy Lab, 'Small Online Business Growth Report: Towards an Inclusive Global Economy' (eBay, January 2016), https://www.ebaymainstreet.com/sites/default/files/ebay_global-report_2016-4_0.pdf.

different economies using e-commerce platforms, and that MSMEs using e-commerce can sustain exports for a longer period of time.¹⁵

Sharing/gig economy platforms have created new opportunities for businesses and individuals. For example, food delivery platforms like GrabFood and Deliveroo allow restaurants and food stalls to take advantage of an additional channel (i.e., demand for delivered food) without substantial investment in delivery services. The rise of the sharing/gig economy has also led to the creation of jobs that are more flexible, catering to individuals who have to balance a job with other responsibilities. Importantly, there are sharing/gig economy platforms that allow individuals to find jobs at minimal search costs, much like job search platforms/portals examples being FastJobs and Upwork.

Additionally, digital technologies and tools offer lower fixed costs and near zero marginal costs for new business entrants. For instance, a number of open-source programs can provide firms with digital services at a lower capital cost. Often, all that is required is a personal computer and an internet connection to benefit from the digital economy's business opportunities. LibreOffice, for one, provides a suite of office applications for free compared to subscription rates of up to USD100 per annum for standard suites. Gmail and Yahoo! Mail provide free communication platforms to reach a global audience. Skype and Viber enable teleconferencing calls. Facebook, Twitter, Baidu, and Vk.com offer free virtual publicity pages for one's venture, while Carousell, MercadoLibre, and Wix.com enable digital entrepreneurs to create their own listings and websites for their business ventures. In addition, cloud computing allows companies and individuals with limited resources to use online services to store and process data. For example, IBM launched an integrated quantum computing system for commercial use. Subscribers to the service are able to harness the computational power of quantum computers, allowing data to be processed much faster than average computers. Such services can significantly lower the barriers to entry for firms wishing to employ data analytics to help them improve their businesses.¹⁶

Furthermore, digital technologies and tools have facilitated the completion of routine tasks. For instance, real-time inventory tracking provides businesses with a more complete picture of current supplies and stocks. E-invoicing tools allow firms to issue invoices more quickly than hand-written ones. Some of these tools can also be directly linked to government portals for taxation and other purposes. Regulatory technology (regtech) tools enable firms (particularly those in the financial industry) to ensure adherence to government regulations through means such as automatically submitting regular business activity reports or flagging potential issues as soon as pre-programmed safeguards and rules are violated.

Finally, government agencies are increasingly leveraging digital technologies and tools to improve public service provision. For example, e-government portals can facilitate applications for licences and other documents; tax filing; and procurement activities. Additionally, digital technologies and tools can be employed to deliver key services such as education and health. Governments can further utilise supervisory technology (suptech) tools to improve their oversight. Other potential uses include implementing electronic/digital identification (eID) to provide more targeted support to specific groups, undertaking stakeholder consultations and enhancing the dissemination of information.

¹⁵ Hanne Melin Olbe, 'Bridging Distance for Development: Regulatory Cooperation Applied to Consumer Rights, Parcel Delivery and Sales Tax' (Geneva: International Centre for Trade and Sustainable Development, 2017), <http://e15initiative.org/publications/bridging-distance-for-development-regulatory-cooperation-applied-to-consumer-rights-parcel-delivery-and-sales-tax/>.

¹⁶ 'IBM Unveils World's First Integrated Quantum Computing System for Commercial Use', IBM News Room, 4 June 2019, <https://newsroom.ibm.com/2019-01-08-IBM-Unveils-Worlds-First-Integrated-Quantum-Computing-System-for-Commercial-Use>.

3. Data, businesses and society

Data is critical to the digital economy, with some analysts even referring to data as the ‘oil’ or ‘fuel’ of this new economy.¹⁷ Data analytics is arguably not a new phenomenon.¹⁸ However, advances in ICT have lowered the price of broadband subscriptions in many economies, as well as the cost of collecting and using data on a large scale. Other technologies and tools that are gaining widespread adoption include cloud services, IoT and AI. Firms now have greater connectivity and access to new ways of handling and deriving insights from data, turning this into yet another determinant of a firm’s competitiveness. While a full exploration of the topic is beyond the scope of this paper, examples of how data analytics is transforming business and society are provided in this section.

First, data analytics allows businesses to target services based on the needs and preferences of customers. Take the example of Spotify, a music streaming platform. The company can improve customer satisfaction by creating customised content such as playlists through analysis of an individual’s preferences including frequently played albums, artists and musical genres. Satisfied customers are likely to renew their subscription to Spotify and recommend it to their friends, increasing the overall value of this platform. Other businesses and services such as social media networks, e-mail providers, and businesses operating in multi-sided markets (e.g., e-commerce platforms) can similarly use data analytics to improve products and services. Cisco estimates that between 2017 and 2022 the number of networked devices will increase by about 10.5 billion, with the number of networked devices per capita increasing from 2.4 to 3.6 over the same period.¹⁹ With more people and devices connected to the internet, the importance of data for businesses will increase dramatically since the value of data increases exponentially with its volume.

Second, data analytics can improve the functioning of global value chains. Various types of data may have to be exchanged internally (e.g., between research and development (R&D) centres, production facilities and headquarters) as well as externally (with parties such as suppliers, logistics providers and customers) for different reasons. For example, relevant data allow business headquarters to plan and coordinate production across facilities. Technical and production data enable the provision of remote technical assistance and guidance by teams in different locations. Live monitoring of machinery allows firms to schedule predictive maintenance and minimise downtime.

Third, the application of data analytics can improve productivity in various sectors of the economy, including retail, agriculture and construction. For example, new technologies, combined with more intensive data use, can improve sustainable productivity in agriculture; enhance trade in agricultural products through improved traceability and trade facilitation; and enable the design and implementation of better policies for agriculture.²⁰ In the construction industry, real-time updates on site surveying, incident monitoring and inventory can reduce construction time by improving efficiency and site workflow, as well as worker safety.

¹⁷ Laurence Morvan, ‘Data: The Fuel of the Digital Economy and SME Growth’ (Accenture, 2016), https://www.accenture.com/_acnmedia/pdf-29/accenture-data-the-fuel-of-the-digital-economy-and-sme-growth.pdf; ‘Data Is Giving Rise to a New Economy’, *The Economist*, 6 May 2017, <https://www.economist.com/briefing/2017/05/06/data-is-giving-rise-to-a-new-economy>.

¹⁸ Business intelligence, historical trend analysis and patterns have long been an integral part of many firms before the current development, which has been variously termed data-driven growth, the fourth industrial revolution, Industry 4.0.

¹⁹ Cisco, ‘Cisco Visual Networking Index: Forecast and Trends, 2017–2022’ (Cisco, 2019), <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-741490.pdf>.

²⁰ Simone Giesler, ‘Digitisation in Agriculture – From Precision Farming to Farming 4.0’, *Bioeconomy BW*, 9 April 2018, <https://www.bioeconomie-bw.de/en/articles/dossiers/digitisation-in-agriculture-from-precision-farming-to-farming-40/>; OECD, ‘Digital Opportunities for Better Agricultural Policies’, 2019, <https://www.oecd.org/fr/innovation/digital-opportunities-for-better-agricultural-policies-571a0812-en.htm>; Marie-Agnes Jouanjean, ‘Digital Opportunities for Trade in the Agriculture and Food Sectors’, 2019, https://www.oecd-ilibrary.org/agriculture-and-food/digital-opportunities-for-trade-in-the-agriculture-and-food-sectors_91c40e07-en.

Despite gaps in measuring the digital economy, research has increasingly found a positive relationship between the intensity of data use and economic growth. For example, McKinsey Global Institute finds that global flows of data raised world GDP by at least 10 percent (valued at USD 7.8 trillion in 2014) and that the contribution of data flows is only second to that of goods (USD 2.3 trillion vs. USD 2.7 trillion).²¹ In fact, the combined indirect and direct contribution of data flows to world GDP may be higher if one considers the effect of cross-border data flows on other types of flows including goods.²²

Fourth, data analytics and IoT are impacting everyday life by making household items more interactive. The introduction of IoT has brought numerous benefits.²³ For instance, smart fridges are able to inform their owners when certain products have run out. Smart lighting systems can increase energy efficiency by adjusting brightness levels when people are in the vicinity.

Technologies such as IoT have made it possible for individuals to know more about themselves. For instance, smart watches contain components such as a built-in pedometer, a GPS tracker, and/or a heartbeat monitor. Linked to computers and mobile phones via the internet, such wearables provide real-time updates on an individual's health and habits, among others. Certainly, such devices can also be used to monitor individuals who need round-the-clock care and supervision such as patients and the elderly, in real time where necessary.

Finally, data analytics can be harnessed to improve infrastructure and the provision of public services. In transportation, real-time updates from vehicles on the road provide information for digital map platforms to estimate traffic density. Wayfinding applications then provide the latest traffic information to advise drivers of potential bottlenecks and suggest alternate routes. Smart traffic lights, installed with programs that dynamically respond to the traffic situation, can communicate with other traffic lights to alter light timings and facilitate traffic flow. In public transit, transport providers can harness mobile applications to create dynamic bus routes and schedules that are more responsive to commuter demand. While these examples are in 'sector silos' and do not involve synergies with other areas, some governments are already looking at more holistic applications of technologies to improve delivery of public services by creating and/or piloting 'smart cities' projects based on the IoT.²⁴ As an illustration, Singapore is developing a smart town where several technologies will be co-deployed for the benefit of residents. Pedestrian and vehicle traffic data collected by motion sensors along common areas will be used by the government to strategically build community networking spaces and amenities where pedestrian traffic is high. The same sensors can also be used as input for smart lighting to automatically adjust luminosity based on human traffic. Sensors will also be deployed to analyse the performance of key estate services such as lighting pumps and waste collection for predictive maintenance.²⁵ However, it should be acknowledged that even as these initiatives progress, there are legitimate concerns (e.g., those related to privacy and the potential commodification of public space) that need to be resolved in parallel.

²¹ James Manyika et al., 'Digital Globalization: The New Era of Global Flows' (McKinsey Global Institute, March 2016), <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-globalization-the-new-era-of-global-flows>.

²² For example, cross-border e-commerce now accounts for 12 percent of the global goods trade. Data flows allow service exports to be delivered digitally. An environment that supports global digital transactions and communication in turn supports increased foreign direct investment (FDI). People flows have also benefited from digital platforms such as Booking.com and Airbnb.

²³ Luigi Atzori, Antonio Iera and Giacomo Morabito, 'The Internet of Things: A Survey', *Computer Networks* 54, no. 15 (October 2010): 2787–805, <https://doi.org/10.1016/j.comnet.2010.05.010>.

²⁴ A. Zanella et al., 'Internet of Things for Smart Cities', *IEEE Internet of Things Journal* 1, no. 1 (February 2014): 22–32, <https://doi.org/10.1109/JIOT.2014.2306328>.

²⁵ Irene Tham, 'Smart Designs in Punggol Northshore Residences', *The Straits Times*, 22 April 2019, <https://www.straitstimes.com/singapore/smart-designs-in-punggol-northshore-residences>.

Challenges of the digital economy

Just as the digital economy provides numerous opportunities, it presents significant challenges for policymakers, businesses and individuals. It is worthwhile to point out that while for some issues the solutions may be clear and enjoy broad support from stakeholders, there is disagreement on other issues and potential solutions may involve trade-offs that affect the interests of different parties. In many cases there will be a need to take differing views into consideration, and to conduct broad consultation of stakeholders on the digital economy's regulations and policy initiatives that involve businesses, local communities and others.

1. Data privacy and security

While data drives innovation and provides more opportunities, some fear that the increasing dependence of businesses and the economy on data can result in data protection issues with potentially massive damage to the economy and consumer trust.²⁶ The Center for Strategic and International Studies (CSIS) and McAfee estimate that close to USD600 billion is lost to cybercrime annually, an increase from about USD445 billion in 2014.²⁷

Governments are under pressure to improve data privacy and protection and advance other public policy objectives such as improving cybersecurity infrastructure, and ensuring that citizens benefit from the digital economy. Many have put in place or are in the process of enacting new regulations pertaining to data collection, storage, processing and transfer.

While privacy is a legitimate public policy objective, it is important to avoid placing undue burdens on businesses and governments. For example, although firms using the data of European Union residents are already subject to the European Union's strict general data protection regulation (GDPR) requirements, other economies may put in place their own data protection regimes without considering the possibility of duplication with the GDPR and other privacy regimes. Several literature have attempted to determine the costs of data-related regulations including data localization and fragmented regulations. For instance, Bauer et al. analysed proposed or enacted data localisation rules in seven economies and found that they lowered GDP by between 0.1 and 1.7 percent.²⁸

Therefore, it is critical that economies find the right balance in approaching data-related issues (i.e., with relatively minimal impact on firms' access and use of data while supporting legitimate public policy objectives). For instance, economies may wish to take a tiered approach to data-related regulations, where lighter-touch regulations in some sectors are complemented with effective

²⁶ 'Cathay Pacific Flags Data Breach Affecting up to 9.4m Passengers', *Channel NewsAsia*, updated 25 October 2018, <https://www.channelnewsasia.com/news/asia/cathay-pacific-passenger-data-breach-security-10861036>; Eduard Kovacs, 'Millions of Toyota Customers in Japan Hit by Data Breach', *Security Week*, 29 March 2019, <https://www.securityweek.com/millions-toyota-customers-japan-hit-data-breach>; 'Malaysian Data Breach Sees 46 Million Phone Numbers Leaked', *BBC*, 31 October 2017, <https://www.bbc.com/news/technology-41816953>; Kate O'Flaherty, 'Breaking Down Five 2018 Breaches – And What They Mean for Security in 2019', *Forbes*, 19 December 2018, <https://www.forbes.com/sites/kateoflahertyuk/2018/12/19/breaking-down-five-2018-breaches-and-what-they-mean-for-security-in-2019/#45e0bbdb41c4>; Gabriel J.X. Dance, Michael LaForgia and Nicholas Confessore, 'As Facebook Raised a Privacy Wall, It Carved an Opening for Tech Giants', *The New York Times*, 18 December 2018, sec. Technology, <https://www.nytimes.com/2018/12/18/technology/facebook-privacy.html>; 'Facebook Says Companies Got Access to Data Only after User Permission', *The Straits Times*, 19 December 2018, <https://www.straitstimes.com/world/united-states/facebook-says-companies-got-access-to-data-only-after-user-permission>; 'Facebook Used People's Data To Favour Certain Partners and Punish Rivals, Documents Show', *The Straits Times*, 6 December 2018, <https://www.straitstimes.com/world/europe/british-lawmakers-release-internal-facebook-documents>.

²⁷ James Lewis, 'Economic Impact of Cybercrime – No Slowing Down Report' (Center for Strategic and International Studies and McAfee, 2018), https://www.mcafee.com/enterprise/en-us/assets/reports/restricted/rp-economic-impact-cybercrime.pdf?utm_source=Press&utm_campaign=bb9303ae70-EMAIL_CAMPAIGN_2018_02_21&utm_medium=email.

²⁸ Matthias Bauer, Hosuk Lee-Makiyama, Erik van der Marel and Bert Verschelde, 'The Costs of Data Localization: Friendly Fire on Economic Recovery' (Brussels: ECIPE, 2014), https://ecipe.org/wp-content/uploads/2014/12/OCC32014__1.pdf

enforcement. As an illustration, Korea's Personal Information Protection Act enacted on 30 September 2011 is considered among one of the world's strictest privacy regimes (despite the fact that it does not include localisation requirements except for certain types of data such as financial and medical data) because its enforcement mechanisms include civil, administrative and criminal sanctions.²⁹ Member economies could also consider participating in APEC-driven initiatives such as the APEC Cross-Border Privacy Rules (CBPR) and Privacy Recognition for Processors (PRP) systems. To enhance interoperability, economies could refer to the APEC Privacy Framework (updated in 2015) to provide a set of principles and implementation guidelines on effective privacy protection to businesses and government entities.

2. *Protection of intellectual property rights, and data/content sharing*

The digital economy has made the protection of intellectual property rights (IPR) more pertinent and more challenging at the same time. As distribution channels have become available to almost everyone with internet access, it has become easier to commit fraud and illegally distribute copies of copyrighted material across the internet. At the same time, it has become harder for regulators to assess which transactions or channels are legal and which involve intellectual property theft.

Notwithstanding the need for better protection of intellectual property rights, it remains important for firms to share and collaborate more as it may lead to quicker breakthroughs and avoid duplication of efforts. Examples of such initiatives include the Human Brain project,³⁰ Open Source Drug Discovery³¹ and Future Earth.³² Data sharing also has value beyond scientific research and related applications. However, such practices may not be widespread for various reasons including anticompetitive behaviour and the lack of interoperability of data formats and standards. The OECD finds that while digitisation and technology are playing a bigger role in the economy, most of the improvements in productivity are captured by so-called 'frontier firms', defined as those firms whose labour productivity is in the top 5 percent in each sector.³³ In other words, the productivity growth of frontier firms is higher than that of other businesses in the same sector. It would therefore be important for policymakers to maintain intellectual property systems that promote innovation, while enabling MSMEs and new entrants to compete.

Unlike other mass communications media where the direction of information is generally unidirectional, internet and digital technologies allow individuals to be both content creators and consumers. Indeed, the internet has contributed to the success of many artists, musicians and social influencers, among others. However, it has also facilitated the spread of disinformation and content that encourages acts of terrorism. A discussion of possible policy responses to the political and domestic security concerns raised by social media and other aspects of the digital economy is beyond the scope of this paper.

3. *Digital divide across multiple dimensions*

Universal, reliable and affordable access to ICT is essential to participation in the digital economy. While more people can now access the internet and related technologies including mobile phones (as seen in Figure 1.4 and Figure 1.5), it is also true that the internet remains out of reach for 48.8 percent of the world's population and 39.9 percent of APEC's population.³⁴ Furthermore, despite transactions

²⁹ Korea Internet & Security Agency, 'Data Protection Laws of Korea' (presentation, 2016), https://unctad.org/meetings/en/Presentation/dtl_eweek2016_HyunJoonKwon_en.pdf.

³⁰ Home page, Human Brain Project, accessed 12 June 2019, <https://www.humanbrainproject.eu/en/>.

³¹ Home page, Open Source Drug Discovery, accessed 12 June 2019, <http://www.osdd.net/>.

³² Home page, Future Earth, accessed 12 June 2019, <http://www.futureearth.org/home>.

³³ Dan Andrews, Chiara Criscuolo and Peter Gal, 'The Best vs the Rest: The Global Productivity Slowdown Hides an Increasing Performance Gap across Firms', blog, VoxEU.Org, 27 March 2017, <https://voxeu.org/article/productivity-slowdown-s-dirty-secret-growing-performance-gap>.

³⁴ Rati Skhirtladze et al., *Measuring the Information Society Report 2018* (Geneva: ITU, 2018), <https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2018/MISR-2018-Vol-1-E.pdf>.

being increasingly digitally enabled, a significant proportion of products are yet to be digitally delivered. In fact, one of the key successes of the digital economy is the significant increase in the number of small parcels and packages being shipped across borders. This means that even as access to ICT is crucial, access to reliable and resilient infrastructure such as roads and energy is equally important. Roads, along with ports and airports serve as gateways for trade and mobility, while energy infrastructure is crucial to production. Despite the importance of infrastructure in improving connectivity - both in the digital and brick-and-mortar worlds - economies have often underinvested in them. The 2018 APEC Economic Policy Report on Structural Reform and Infrastructure notes that members face significant infrastructure financing gaps. One study indicates that APEC economies will collectively need to spend USD 2 trillion per year from 2020-2025, rising to almost USD 2.5 trillion per year on infrastructure in the 2030-2035 period. The region's overall regional infrastructure needs are expected to increase by almost 92 per cent between 2010 and 2035.³⁵ Economies that are unable to meet this massive infrastructure financing challenge could fall behind their peers in economic growth potential.

The digital divide is not only observed between economies, but also within economies. People living in cities generally have better access to infrastructure than their rural counterparts. The same can be said for population centres in more developed islands vis-à-vis those in less developed islands in archipelagic economies such as Indonesia and the Philippines. Low levels of population density and economic activity make it uneconomic to build some kinds of infrastructure. Individual sectors also vary in terms of their digitalisation. For example, the McKinsey Global Institute has found that the United States has captured only about 18 percent of its digital potential despite being one of the world's most highly digitised economies.³⁶ The agriculture and hunting, mining, construction, and entertainment and recreation sectors have relatively low digitisation rates compared to sectors like ICT, media and professional services. Moreover, the gap in adoption and utilisation between sectors and firms on the frontier vis-à-vis the rest of the economy appears to have widened over time. The lack of access to data, as well as resource limitations and aversion to new technologies, may have contributed to the widening gap. Specifically on the latter, firms with less risk aversion to new technologies are more likely to benefit compared to their peers. Average profit margins in the more digitised sectors grew two to three times faster compared to less digitised sectors.³⁷

Arguably, net neutrality is also an issue related to the digital divide. It is essentially based on the principle that internet service providers should treat all internet communications equally and not discriminate or charge differently based on user, content, website, platform, application, type of equipment, or method of communication. While proponents of net neutrality have indicated that it promotes competition and innovation by facilitating information exchange and maintaining standardisation of data transmission, opponents have argued that it ultimately harms competition by reducing the incentive for telecommunications carriers to invest and improve on existing infrastructure.

4. *Jobs created, jobs lost*

The advent of the digital economy has led to the creation of new kinds of employment. These occupations include data scientists, app developers, ethical hackers, augmented reality (AR) filter creators and drone specialists which were largely unheard of until recently. In fact, the World Economic

³⁵ APEC, *APEC Economic Policy Report 2018: Structural Reform and Infrastructure* (Singapore: APEC, 2018), <https://www.apec.org/-/media/APEC/Publications/2018/11/2018-APEC-Economic-Policy-Report/AEPR-2018.pdf>.

³⁶ James Manyika et al., 'Digital America: A Tale of the Haves and Have-Mores', December 2015, https://www.mckinsey.com/~/media/McKinsey/Industries/High%20Tech/Our%20Insights/Digital%20America%20A%20tal%20of%20the%20haves%20and%20have%20mores/MGI%20Digital%20America_Executive%20Summary_December%202015.ashx.

³⁷ Manyika et al.

Forum (WEF) predicts that 65 percent of children currently enrolled in primary school would eventually be working in jobs that currently do not exist.³⁸

As different and new sets of skills are required for these jobs, it is critical for policymakers to ensure that individuals are equipped with the right skills while they push towards creating more digital economy jobs. In this regard, there may be a need to review current education curricula to ensure they remain relevant in the rapidly changing economy. A shortage of digital economy skills may limit growth for businesses and the career possibilities of workers.³⁹ While it is difficult to make future predictions, policymakers should seek to ensure the provision of skills are relevant to emerging sectors and job categories. This avoids a potential skills mismatch down the road. Continuing skills shortages and mismatches will likely have negative consequences for the economic growth potential of an economy, given the pace of technological and business innovation.⁴⁰

Although ensuring that new entrants to the workforce have the necessary skills is one challenge, another is ensuring employed workers remain relevant as technology evolves. As an example, the OECD has found that within its member economies, approximately 14 percent of jobs were highly automatable and another 32 percent would be radically transformed by technological progress on average.⁴¹ This suggests the need to develop lifelong learning programmes to help individuals to reskill. For those who have lost their jobs to factors such as automation, besides motivating individuals to re-skill, policies would need to identify measures to better match these individuals to available jobs.

Some digital economy jobs with examples being ride-sharing drivers and food deliverers provide more flexibility than office jobs and often do not require advanced ICT skills. However, there is a risk that such employment has created a precarious class of on-demand workers or independent workers that do not make social security contributions and cannot access benefits as they are not regarded as employees.⁴² In some economies, benefits such as health depend on formal employment.

Maximising opportunities and overcoming challenges: The twin role of measurement and structural reforms

Apart from discussing the opportunities and challenges presented by the digital economy, it is important to maximise opportunities while overcoming the challenges.

Statistics and indicators play an important role for evidence-based policymaking. Clear measurement frameworks, coupled with regularly updated and comparable data across economies and time can provide policymakers with a good overview of different areas relevant to the digital economy. Without baseline measures and data that can be tracked, it is difficult to determine if policy objectives have been met or if adjustments should be made. However, measurement of various aspects of the digital economy is still a work in progress for a variety of reasons. Section B summarises the motivations for measuring digital flows, the digital transformation, and the monitoring of regulations affecting the digital economy. It also reviews some issues affecting the measurement of the digital economy.

Broadly understood, structural reforms remove structural barriers so as to improve access to economic opportunity. If implemented properly, structural reforms may boost economic efficiency and set the economy on a relatively higher growth path. A holistic approach to implementing structural reforms

³⁸ World Economic Forum, *The Future of Jobs Report 2016: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution* (Geneva: World Economic Forum, January 2016), <http://reports.weforum.org/future-of-jobs-2016/>.

³⁹ Paul J. DiMaggio and Eszter Hargittai, 'From the "Digital Divide" to "Digital Inequality": Studying Internet Use as Penetration Increases' (Woodrow Wilson School of Public and International Affairs, Center for Arts and Cultural Policy Studies, 2001).

⁴⁰ Jan A.G.M. van Dijk and Alexander J.A.M. van Deursen, *Digital Skills: Unlocking the Information Society* (New York: Palgrave Macmillan, 2014).

⁴¹ OECD, *OECD Employment Outlook 2019* (Paris: OECD, 2019), <https://www.oecd.org/employment/outlook/>.

⁴² Valerio De Stefano, 'The Rise of the "Just-in-Time Workforce": On-Demand Work, Crowd Work and Labour Protection in the "Gig-Economy"', *SSRN Electronic Journal* (2015), <https://doi.org/10.2139/ssrn.2682602>.

has the potential to allow economies to seize opportunities while addressing the challenges of the digital economy. Section C provides a brief overview of the application of four of the Economic Committee's (EC's) core structural reforms - competition policy and law; regulatory reform; public sector governance; and ease of doing business (EoDB) – to the digital economy's challenges. Recognising that the EC's core structural reforms constitute only one aspect of APEC's broad structural reform-related work, the role of supplementary structural reforms and, where relevant, supporting policies to ensure that the benefits of the digital economy are more inclusive have also been reviewed.

B. Challenges in measuring the digital economy

In order to plan and make more informed decisions, policymakers need a clear, well-elaborated measurement framework supported by reliable statistics that are regularly updated with data comparable across sectors and economies. Achieving this goal will entail consistency in data collection and analysis, cooperation between statistical agencies, and agreement on common standards and practices at the regional and global levels, among others. Efforts to measure the digital economy must overcome fundamental disagreements on the definition and scope of the digital economy, and serious technical challenges. Even if achieving comparability is not feasible in the short term, economies can help to overcome these measurement challenge by providing details about what statistics they are measuring and how they have been derived.

The absence of consensus on a definition of the digital economy presents serious challenges for efforts to measure it, as it raises a number of important questions: (1) should the digital economy be defined narrowly as those activities facilitated by online platforms, such as online purchasing and online movie streaming? (2) or should it instead be defined broadly as all the sectors that have incorporated data and the Internet into their production processes? (3) the term digital sector has been mentioned frequently, but what is it exactly and is it equivalent to the digital economy? (4) what is its relation with the ICT sector? (5) what is its relation to e-commerce, which is arguably only one aspect of the digital economy?

Definitions aside, there are a range of challenges that pertain more to the technicalities of the measurement itself. Some of these relate to existing issues that include limitations to the current national accounts framework and challenges in measuring services, while others relate to newer issues such as measuring certain digital-related activities. Although it is important to accurately measure digital and digitally-facilitated flows, monitoring the digital transformation is equally important as it allows policymakers to better understand how digitalisation is changing the economy and the society as a whole and to devise appropriate policy responses. In this regard, gaps and challenges remain, despite there having existed for some time efforts by economies and various organisations to collect and analyse indicators to monitor the digital transformation.^{43,44}

Last but not least, the advent of the digital economy has brought with it new business models that have fundamentally changed the way that business is conducted and the products and services that are traded. In this environment, it is important to be able to monitor policies and regulations with implications for the digital economy. The next section provides a summary of some of these challenges. Annex A discusses them in greater details and indicates some of the ongoing work by a number of organisations to measure different aspects of the digital economy.

Definition and measurement

Definition and measurement go hand-in-hand. Definition provides the scope of coverage and allows statisticians to come up with a corresponding measurement framework. A review of ongoing work by various organisations on the digital economy shows them clearly defining what they are measuring and acknowledging the limitations of the approaches taken before proceeding to collect and analyse the relevant data. For instance, the United States Bureau of Economic Analysis (BEA) published a study in 2018 to estimate the size and contributions of digital activities currently embedded in the existing national accounts, paving the way for the construction of a new digital economy satellite account. In the study, the bureau first developed a conceptual definition of the digital economy, including three

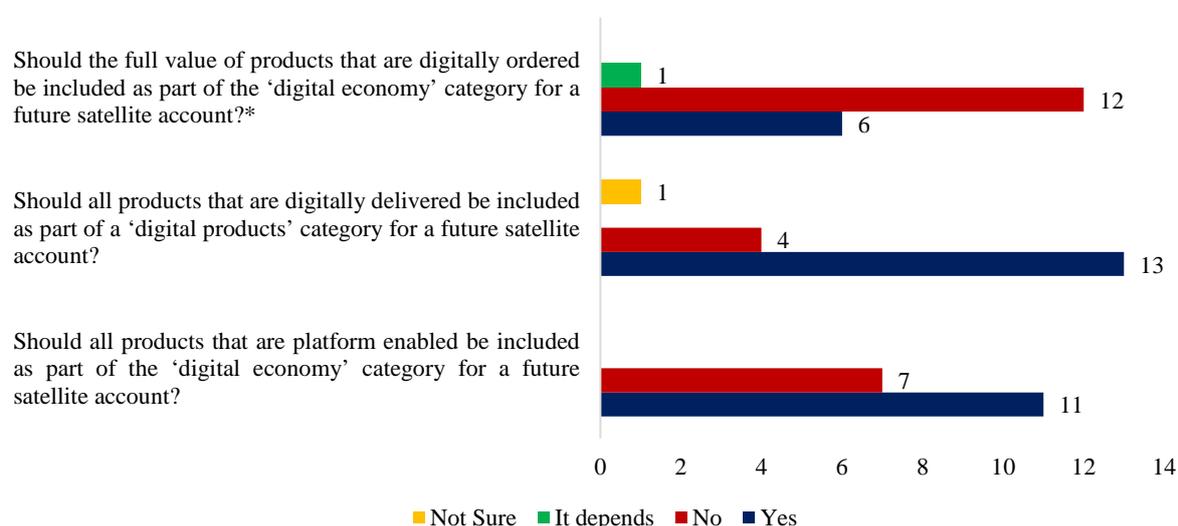
⁴³ For the purposes of the AEPR, “digital and digitally-facilitated flows” includes, but are not limited to electronically delivered goods or services, other types of data flows, and goods sold via e-commerce channels.

⁴⁴ For example, the International Telecommunication Union’s (ITU) percentage of individuals using the internet (details at <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>) and the World Bank’s percentage of individuals having mobile money accounts (details at <https://globalindex.worldbank.org/>).

parts: (1) the digital-enabling infrastructure, which enables the existence and operation of a computer network; (2) the digital transactions using that system; and (3) the content created and accessed by digital economy users. Using this definition, the bureau then identified the detailed goods and services that should be included in the sphere of the digital economy using its supply-use framework, and then provided its preliminary estimate of the size of the digital economy.⁴⁵

However, reaching consensus among different stakeholders is not an easy endeavour. As an illustration of the varying opinions, the OECD Informal Group on Measuring GDP in Digitalised Economy conducted a survey on economies' practices and thoughts on the definition and classification of digital economic activities and the statistical challenges of creating a new satellite account.⁴⁶ The survey received 19 responses from task force members. Differing views on the nature and economic value of the digital economy led to mixed answers for the questions regarding the definition of digital economy (see Figure 1.6).

Figure 1.6. Summary of selected OECD survey responses on measuring GDP in digitalised economy



Note: *One member checked both yes and no

Source: Jennifer Ribarsky, 'Summary of Responses of the Advisory Group: Survey on Digital Economy Typology' (STD/CSSP/WPNA(2017)1, Paris: OECD, 22 September 2017),

[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=STD/CSSP/WPNA\(2017\)1&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=STD/CSSP/WPNA(2017)1&docLanguage=En).

The lack of an agreed definition leads to divergence in the measurement frameworks, and affects the comparability of statistics between economies and across years. Based on a broad definition of the digital economy, the China Academy of Information and Communications Technology (CAICT) estimates the size of China's digital economy to be RMB 31.3 trillion (around USD 4.5 trillion) in 2018.

⁴⁵ Kevin Barefoot et al., 'Defining and Measuring the Digital Economy' (Suitland, MD: Bureau of Economic Analysis, 15 March 2018), <https://www.bea.gov/system/files/papers/WP2018-4.pdf>.

⁴⁶ A satellite account is an account that is developed to measure the size of economic sectors that are not defined as industries in national accounts. One example is the tourism sector, which is a combination of industries such as transportation, accommodation, food and beverage services, recreation and entertainment, and travel agencies. Indeed, tourism is the first activity to use worldwide satellite account standards to measure its impact on economies (see UN World Tourism Organization, 'Basic Concepts of the Tourism Satellite Account (TSA)', accessed 23 August 2019, <http://statistics.unwto.org/sites/all/files/docpdf/concepts.pdf>).

This accounted for 34.8 percent of China's GDP, up from 32.9 percent in 2017.⁴⁷ Using a narrower definition, the US BEA estimates the size of the digital economy in the US to be USD 1.35 trillion in 2017, making up 6.9 percent of its nominal GDP.⁴⁸ Due to the use of very different methodologies, it would be premature to conclude that China's digital economy is more than three times the size of the US digital economy. For frameworks to be comparable, it is important to look at what industries and products are included as well as the measurement methodology.

Recognising that there is currently no clear and agreed definition of the digital economy and coming up with one may take some time, an approach taken by several economies and organisations is to limit the scope to certain technology-intensive sectors (e.g. ICT), e-commerce, or digital trade. Using narrower terms and sectors as proxies to measure the digital economy is, however, less than ideal for several reasons, including the same lack of an agreed definition as the digital economy itself and whether well-defined sectors are a good proxy for the digital economy.

Challenges beyond defining the digital economy

There are various challenges related to the technicalities of measurement itself which further complicate the process of establishing a feasible measurement framework. These challenges include: limitations of the current national accounts framework; suitability of existing measures such as GDP; and barriers on data sharing between organisations for various reasons including data privacy and security.

1. *Measuring digital and digitally-facilitated flows*

(In)congruency of the System of National Accounts (SNA) and limitations of GDP

The current framework used by economies was developed in the 1950s to 1960s and assigned clearly defined roles to all economic actors (i.e. producers, distributors or consumers). It relies on customs and tax data, as well as high response rates to mandatory statistical surveys. The advent of the digital economy has affected some of these fundamental assumptions and methods. **Firstly**, the digital transformation has changed the way economic actors interact and transact with one another. For example, the entry of ride sharing providers such as Uber has disrupted the established relationship between taxi service providers and their customers, hence affecting statistical agencies' ability to accurately measure the contribution of the transport service sector to the economy through tax data and surveys of the taxi industry. Measurement challenges are aggravated by the fact that many consumers-turned-service providers are operating beyond the current production frontier, are not registered businesses and/or do not report all taxes. Furthermore, digital intermediary platforms may be located in another economy, hence out of reach of the relevant statistical agencies.

Secondly, profit shifting, whereby firms move value generated in one jurisdiction to a lower-tax one, has been facilitated by digitalisation (e.g., the intangible nature of digital assets and improvements in ICT services). This is particularly the case for certain form of transactions, where the common approach of using legal ownership to assign values may lead to distortions and asymmetries in national accounts. As a result, economic indicators based on those accounts may be inaccurate as well.

Due to the limitations of the current SNA framework, standard measures such as GDP either do not capture or misallocate important aspects of the digital economy. For example, a report by Credit Suisse

⁴⁷ Sohu News, '数字经济, 7本白皮书, 10大亮点 | CAICT核心成果分享' [Digital Economy, 7 White Books, 10 Highlights | Core Findings Shared by CAICT], 6 May 2019, www.sohu.com/a/312039707_735021.

⁴⁸ US Bureau of Economic Analysis, 'Measuring the Digital Economy: An Update Incorporating Data from the 2018 Comprehensive Update of the Industry Economic Accounts' (Suitland, MD: Bureau of Economic Analysis, April 2019), https://www.bea.gov/system/files/2019-04/digital-economy-report-update-april-2019_1.pdf.

indicates that there are at least three categories of products and services not included in the GDP.⁴⁹ **Firstly**, despite replacing the traditional high street stores, the services and products provided by digital intermediaries such as online booking websites based either locally or overseas, have not been fully included.

Secondly, the digital economy has expanded the production boundary in ways that are not captured by traditional GDP measures. The rise of the sharing/gig economy has enabled individuals to borrow or lend a variety of assets from bicycles to houses. Individuals could also provide labour and services to others such as cleaning and repairs and earn income on a part-time or on-call basis. In addition, the reduced price paid by consumers has increased customer surplus and is yet to be reflected in the price indices used to calculate GDP.

Thirdly, ‘free’ digital products produced by households including blogs, videos, and open source software and computer services are not recorded within price indices and are therefore not reflected in GDP. Moreover, ‘free’ digital products/services offered by platforms and funded either by advertising (which may not be attributed to the correct economy) or through the collection of user data is another category underrepresented within GDP measurements.⁵⁰

Constraints in measuring services

The international community has long been plagued by statistical problems associated with services. For example, variations in compilation methods and different thresholds used by surveys have caused the estimated value of services trade data to vary significantly between economies.⁵¹ While digital technologies have allowed services to be traded freely, easily and on a broader scale, they have aggravated the measurement issue, for several reasons.

Firstly, traditional services such as education services that need to be conducted in person in the past, can now be provided digitally in many cases and sometimes for free. **Secondly**, the digital economy has led to further blurring of geographical boundaries, even beyond the fragmentation of production by global value chains. Unlike traditional trade, digital services may consist only of the transfer of data. The constant data flows between different activities (e.g., R&D, sales and advertising) with various actors across numerous locations make it challenging to trace such flows and attribute the value of a particular service to a specific geographical location.⁵² This makes it more difficult for statisticians to record the services and include them within their accounts.

Thirdly, as pointed out by a 2018 IMF report on measuring the digital economy, digitally delivered services can be under-reported in SNA accounts that do not capture transactions on platforms, especially on the import side. Inconsistencies and discrepancies are sometimes found in the services statistics of two trading partners due to differing statistical and data collection methods.

Fourthly, there are increasing vagueness and difficulty in distinguishing the value of products and the accompanying services.⁵³ For instance, the cost of regular system and software updates that keep mobile phones useful may have been included by producers when pricing the product instead of as a separate line item. **Finally**, little progress has been made across the globe on measuring services (e.g., door to door cleaning and repairing services) or free digital services (e.g., online knowledge sharing, medical

⁴⁹ Credit Suisse Research Institute, ‘The Future of GDP’ (Zurich: Credit Suisse, May 2018, <https://www.credit-suisse.com/media/assets/private-banking/docs/mx/the-future-of-gdp-en.pdf>).

⁵⁰ Reinsdorf and Quirós, ‘Measuring the Digital Economy’.

⁵¹ Eurostat, ‘International Trade in Services Statistics – Background’, 28 March 2019, https://ec.europa.eu/eurostat/statistics-explained/index.php/International_Trade_in_Services_statistics_-_background#Asymmetries_in_international_trade_in_services_statistics.

⁵² Credit Suisse Research Institute, ‘The Future of GDP’.

⁵³ Tuan Tran, ‘Approach to Measuring the Digital Economy – Global Affairs Canada’ (presented to the *APEC Workshop on the Digital Economy: Measurement, Regulation and Inclusion*, Santiago, Chile, 6 March 2019), http://mddb.apec.org/Documents/2019/EC/WKSP2/19_ec_wksp2_006.pdf.

consultation, and open source software and computer services) produced by households. In this regard, there may be a need to update household and labour force surveys and improve data collection from tax systems.

Impediments to data sharing and development gaps between economies

One of the ironies of the digital age is that data and statistics that could provide policymakers a better overview of the digital economy are available but not shared. According to a Domo report, more than 2.5 quintillion bytes of data were created every single day in 2018. By 2020, the report estimates that each individual will generate 1.7MB of data every second.⁵⁴ Theoretically, every order and transaction made online is recorded somewhere and it is possible to analyse such data for statistical purposes. This is particularly relevant for digital platforms whose main business is to collect, analyze and create value from these data. However, in practice, data collected and stored by different entities are fragmented and not shared. While individuals and private companies, especially digital platforms have significant amount of data, they are usually reluctant to share it with governments, arguing that it is proprietary and that sharing it would affect their competitiveness and breach their privacy commitments. To further complicate matters, multinational companies (MNCs) often hold data in various jurisdictions whose differing data privacy laws and regulations would impact their data policies. This limits the ability of statistical agencies to accurately measure the size of certain digital economic activities.

A universal measurement framework for the digital economy also needs to take into consideration the development gaps between economies, in order to ensure the feasibility of data collection and comparability of statistics across economies. Developing economies may possess inadequate resources or may require capacity building to bring their statistical collection up to international standards and to ensure comparability and coordination with other economies.⁵⁵ Lack of sustainable funding, inadequate public ICT infrastructure and poor digital literacy among statistical staff are some of the barriers to a comprehensive and accurate statistical system for the digital economy. Some economies are struggling to maintain their existing SNA database, let alone put extra effort into creating a new one. According to the UN Statistics Division, in some economies, entire statistics programmes are supported by only two or three people.⁵⁶

2. Measuring digital transformation

Measuring the size of digital economy is important. Equally important is measuring digital transformation because it allows us to better understand how digitalisation is changing the economy and society as a whole and to adjust policies as required. For instance, with regards to internet access, organisations such as the International Telecommunication Union (ITU) have developed indicators such as the percentage of individuals using the internet, fixed broadband subscriptions per 100 inhabitants, the proportion of households with a computer and the percentage of households with internet connections. The OECD conducts surveys under various programmes including the Programme for International Student Assessment (PISA), the Teaching and Learning International Survey (TALIS) and the Programme for the International Assessment of Adult Competencies (PIAAC) to provide international comparable data on a variety of indicators, many of which describe the relationship between digital technology and education and skills.⁵⁷

While they are useful and informative, existing indicators are not without gaps and challenges. Firstly, these indicators usually do not cover all economies. In some cases, the data may be patchy (available

⁵⁴ Domo, 'Data Never Sleeps 6.0', 2018, <https://www.domo.com/solution/data-never-sleeps-6>.

⁵⁵ World Bank, 'Building Statistical Capacity to Monitor Development Progress' (Washington, DC: World Bank, 2006), <http://documents.worldbank.org/curated/en/795451468314360987/Building-statistical-capacity-to-monitor-development-progress>.

⁵⁶ Lisa Cornish, 'At UN World Data Forum, a Focus on Data Capacity, Devex, 22 October 2018, <https://www.devex.com/news/sponsored/at-un-world-data-forum-a-focus-on-data-capacity-93717>.

⁵⁷ OECD, 'Computers, Education & Skills', Education GPS, accessed 19 September 2019, <https://gpseducation.oecd.org>.

only for certain years) and the timeliness of the data (how recently it is produced) could also be a concern. Moreover, indicators provided by economies may be derived from varying data sources as well as through the use of different collection methodologies and approaches (e.g., household surveys versus business surveys), which means that data may not be comparable.

Second, some existing indicators need to be fine-tuned to ensure their continued relevance in the digital era. For example, indicators on access which includes the percentage of individuals using the internet, would be more informative if supplemented with additional information on how individuals use the internet (e.g., online education, online sales/purchases, cloud storage, content creation, social network, etc.), information which may not be collected by all economies. Similarly, indicators on skills, abilities and competencies to thrive in the digital economy should go beyond measures such as enrolment in tertiary education to include information on whether individuals have the specific technical and cognitive skills. This is particularly so considering that getting a post-secondary degree no longer guarantees one a job.

In terms of job creation, new business models introduced by platforms focusing on the gig economy (i.e., ride sharing and food delivery services) have led to a significant increase in the number of independent contractors (as opposed to employees). Yet, current definitions and indicators still group these jobs collectively as ‘alternate work arrangements’, implicitly treating them as a homogeneous and insignificant category. Furthermore, it should be noted that existing indicators do not always provide breakdowns by criteria such as regional (e.g., rural (including remote) and urban), industry (e.g., manufacturing and services), gender and age groups.

Lastly, even as the existing indicators can be improved upon, it should be acknowledged that there are aspects of the digital economy that cannot be captured by existing indicators and therefore, have to be complemented by new indicators.

3. Measuring how laws and regulations affect various aspects of the digital economy

The advent of the digital economy has brought with it new business models. In turn, they have changed how businesses, including trade, are conducted and what products are being traded. To ensure that economies are able to reap the benefits of the digital economy while addressing its challenges, it is important that policies and regulations and their corresponding implications be analysed. In general, policies and regulations with implications for the digital economy can be categorised into two main groups. The first group comprises existing or older measures that arguably were not robust enough to tackle the new challenges posed by the digital economy, and have since become problematic. The second group is made up of newer measures enacted in response to the ongoing transformation for various reasons, including legitimate public policy objectives such as ensuring better data privacy, protection and security; aiding law-enforcement agencies and addressing other domestic security concerns. To perform the needed analyses, economies and organisations would have to have comprehensive policy databases that are updated and reviewed at regular intervals.

C. Overview of application of structural reforms to the digital economy and priorities for reforms

A holistic and up-to-date approach to structural reform will be critical to the efforts of APEC economies to maximise the benefits and economic opportunities brought about by the digital economy while overcoming the challenges and potential harms. To ensure alignment with the work of the Economic Committee (EC), this report will discuss structural reforms in three broad themes, namely: core structural reforms, supplementing core structural reforms, and optimising structural reforms.

Core structural reforms

In order to fulfil its mandate to promote structural reform activities within APEC, the Economic Committee (EC) pursues work in core structural reforms such as competition policy and law, regulatory reform, ease of doing business (EoDB) and public sector governance. Each of these reforms can be applied to digital economy opportunities and challenges.

In many respects, **competition policy** is one of the most critical structural reforms for the digital economy. For example, competition policies have tremendous impact on prices and coverage in the telecommunications sector, which is the backbone infrastructure for delivering digital economy products and services. Moreover, up-to-date competition policies can facilitate new market entrants and the uptake of new business models, while helping to ensure that digital technologies and tools are not exploited to the detriment of competition. There are currently differing views on the applicability of traditional competition policy approaches in the digital economy. On one hand, some literature have noted that traditional approaches grounded in consumer welfare remain broad enough to be applied in the context of the digital economy.⁵⁸ On the other hand, some have called for new approaches which take into account considerations such as consumer privacy, the use and control of data and the lock-in effect of digital platforms, to better capture the features of modern competition in the digital economy.⁵⁹

One major challenge faced by both regulators and private sector firms is that technologies and business models are evolving rapidly, and policies have had difficulty keeping up with the pace of change. Indeed, there is often a significant gap between technology and policy, with potentially negative implications for businesses and the economy. Complicating the situation are the different rates at which governments around the world have been responding to the digital economy as well as the varied approaches to similar issues. Consequently, participants find it difficult to adhere to the different regulations enacted. This suggests that as APEC economies redouble their **regulatory reform** efforts, they should seek to (1) minimize the burdens on digital participants to the extent possible; and (2) increase international regulatory cooperation (IRC) to ensure greater standardisation and alignment of digital economy policies.

For businesses and entrepreneurs, reaping these benefits, however, depends also on efforts to promote **ease of doing business (EoDB)**. In some economies such regulations are in their infancy, particularly with respect to the digital economy. Furthermore, although digital technology and tools have facilitated transactions (i.e., digitally enabled them), a significant share of products are not digitally delivered. The digital economy has led to a boom in e-commerce and the consequent trade in small parcels across

⁵⁸ For example, see Jacques Crémer, Yves Alexandre de Montjoye and Heike Schweitzer, 'Competition Policy for the Digital Era' (Luxembourg: Publications Office of the European Union 2019), <https://ec.europa.eu/competition/publications/reports/kd0419345enn.pdf>.

⁵⁹ For example, see United Nations Conference on Trade and Development (UNCTAD), 'Competition Issues in the Digital Economy', https://unctad.org/meetings/en/SessionalDocuments/ciclpd54_en.pdf; Lina M. Khan, 'Amazon's Antitrust Paradox', *The Yale Law Journal* 126, no. 3 (January 2017), <https://www.yalelawjournal.org/note/amazons-antitrust-paradox>

borders. E-commerce is only one example of how developments in the digital realm can affect the non-digital realm. While it is important to update regulations for the digital age, it will also be important to address issues related to cross-border trade for the digital economy to operate efficiently.

Last but not least, governments can play an important role in charting the direction of the digital economy by applying digital technology and tools to improve **public sector governance** in areas such as tax filing, licence applications, and making documents and information easily accessible to the public. They can also use them to enhance policy design, experimentation, implementation, monitoring and evaluation. By acting as a trailblazer, governments can encourage the use of such technologies and tools by the private sector and society as a whole.

Supplementing core structural reforms

While advancements in new technologies and business models have led to more opportunities, the distribution of the benefits of the digital economy has been unequal. An example is in the labour share of GDP, which is often considered an indicator of the distribution of income and inclusiveness of economic growth as the majority of people in a society are workers and not capital owners. Both industrialised and developing APEC economies exhibited a downward trend between 1995 and 2014.⁶⁰ This indicates that income inequality is increasing in the region. The digital economy can exacerbate inequality and exclusion through different channels such as: a reduction in jobs and employment opportunities; lack of skills; and limited access to infrastructure, technology, and social protection.

Recognising that Economic Committee's (EC's) core structural reforms constitute only one aspect of structural reform-related work, the committee produced a document in 2018 proposing three approaches that economies may take to better harness structural reform to tackle complex challenges an example being inclusive growth. The document notes the importance of adopting a holistic approach that supplements core structural reform reforms with supporting policies. This can entail: (1) **making core structural reforms pro-inclusive** and/or **undertaking structural reforms in specific areas** generating positive externalities such as **human capital development, infrastructure and social security**; and (2) **ensuring that core structural reforms are aligned with other types of reforms and supporting policies** to maximise the impact with respect to policy objectives such as inclusive growth. These approaches can be applied to the digital economy's challenges as well.

Optimising structural reforms

Structural reforms are important to maximise the benefits and economic opportunities brought about by the digital economy while overcoming their challenges and avoiding harms. However, structural reforms need to be optimised to ensure their continued relevance. When implementing policies, policymakers need to ensure they are well-coordinated, coherent and complementary to one another. This would entail getting the basics right by focusing on core structural reforms, and complementing them with supplementary structural reforms and supporting policies. Lack of coordination can also lead to missed opportunities regarding possible synergies with other structural reforms and supporting policies that would increase the likelihood of achieving policy objectives. This requires policymakers to reach across traditional policy silos and across different levels of government to improve collaboration and develop a whole-of-government approach to digital economy policy.

Part 2 of this report focuses on the role of core structural reforms (i.e. competition policy, regulatory reform, public sector governance and ease of doing business), while Part 3 presents the importance of supplementing core structural reforms and of holistic policy approaches to ensure inclusion in the digital economy.

⁶⁰ APEC Policy Support Unit, 'APEC Regional Trends Analysis: Declining Labour Share and the Challenge of Inclusion' (Singapore: APEC, November 2017), <https://www.apec.org/Publications/2017/11/APEC-Regional-Trends-Analysis-2017>.

PART 2: CORE STRUCTURAL REFORMS FOR DIGITAL ECONOMY DEVELOPMENT

Policymakers need to review existing policies and build on them to maximise the benefits and economic opportunities brought about by the digital economy while overcoming the challenges to people, firms and the environment. Structural reforms constitute an important area where more attention is needed.

There are many definitions of structural reform. The European Commission defines structural reforms as those that tackle ‘obstacles to the fundamental drivers of growth by liberalizing labour, product and service markets, thereby encouraging job creation and investment as well as improving productivity. They are designed to boost an economy’s competitiveness, growth potential and adjustment capacity.’⁶¹ The IMF’s definition is similar, indicating that ‘structural reforms are measures that aim to raise productivity by improving the technical efficiency of markets and institutional structures, or by reducing impediments to the efficient allocation of resources’.⁶² Recognising differences in the levels of development of its member economies, APEC defines structural reform as a ‘policy change related to institutional frameworks, regulation and government policy [designed], so that barriers to market-based incentives, competition, regional economic integration and improved economic performance are minimized.’⁶³ In broad terms, structural reform involves removing structural barriers so that individuals can better access economic opportunities.

If properly implemented, structural reforms can boost economic efficiency and set the economy on a higher growth path. In the case of APEC, a study conducted in 2011 showed that structural reforms in several backbone services sectors including transport, energy and telecommunications could generate additional real income of USD 175 billion a year (in 2004 dollars) after a 10-year adjustment period. Productivity improvements associated with these reforms, between 2 and 14 percent, could ensure sustainable economic growth. In addition, potential gains from structural reforms could be almost twice those achieved through further liberalisation of the goods trade.⁶⁴

The Economic Committee (EC) has a mandate from APEC Structural Reform Ministers to promote structural reform activities under the Renewed APEC Agenda for Structural Reform (RAASR).⁶⁵ The EC defines core structural reforms as its main work areas under the RAASR.⁶⁶ This part of the report will evaluate the application of four of the EC’s core structural reforms (competition policy and law; regulatory reform; public sector governance; and ease of doing business) to the digital economy’s opportunities and challenges.

A. Competition policy and law

Competition policy refers to laws, cases, policies, rules and regulations of government that protect and preserve the competitive process in markets with the goal of promoting economic efficiency and

⁶¹ ‘Structural Reforms for Economic Growth’, European Commission, accessed 12 June 2019, https://ec.europa.eu/info/business-economy-euro/growth-and-investment/structural-reforms/structural-reforms-economic-growth_en.

⁶² ‘IMF Survey: IMF Refines Analysis and Advice on Structural Reforms’, IMF, accessed 12 June 2019, <https://www.imf.org/en/News/Articles/2015/09/28/04/53/sopol110915a>.

⁶³ APEC, *2011 APEC Economic Policy Report* (Singapore: APEC, 2011), <http://publications.apec.org/Publications/2011/05/2011-APEC-Economic-Policy-Report>.

⁶⁴ APEC, ‘The Impacts and Benefits of Structural Reforms in Transport Energy and Telecommunications Sectors’ (Singapore: APEC, January 2011), <http://publications.apec.org/Publications/2011/01/The-Impacts-and-Benefits-of-Structural-Reforms-in-Transport-Energy-and-Telecommunications-Sectors>.

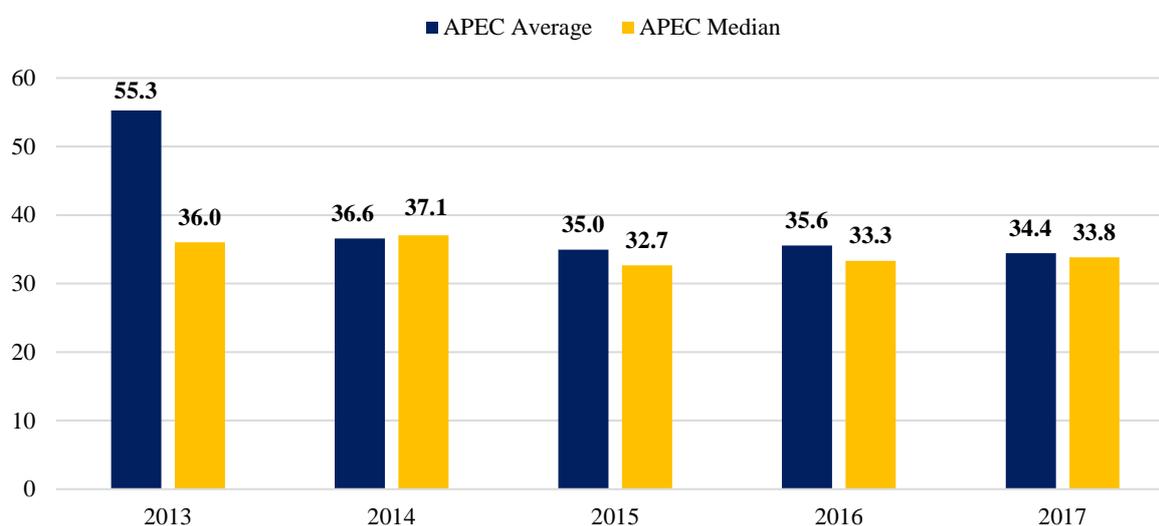
⁶⁵ APEC, ‘Attachment A – The Renewed APEC Agenda for Structural Reform (2016–2020)’, 2015, https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Structural-Reform/2015_structural/Attachment-A.

⁶⁶ APEC, ‘Economic Committee Chair’s Report 2018’ (2018/CSOM/015, Singapore: APEC, 2018), http://mddb.apec.org/Documents/2018/SOM/CSOM/18_csom_015.pdf.

maximising consumer welfare. It also entails advocacy of pro-competitive principles when the government formulates other laws, policies, rules or regulations.

Competition policy is one of the most critical structural reforms for the digital economy. **First**, increased competition can lead to reduced prices and improved regional coverage in the telecommunications sector, which is the infrastructure for delivering digital economy products and services. While the price of internet and broadband access has decreased over time, affordable access is still a challenge in many APEC economies. For example, although significant progress has been made within the APEC region with average fixed broadband prices falling from PPP\$ 55.3 in 2013 to PPP\$ 34.4 in 2017 (see Figure 2.1.), there continues to be wide variations among member economies. In 2017, the average fixed broadband cost in APEC ranged from a low of PPP\$ 6.75 to a high of PPP\$ 62.88. As a proportion of gross national income per capita, the percentage for APEC economies ranged between 0.45 and 7.94 percent, with eight economies measuring above 2 percent, the new affordability threshold set by the Broadband Commission.⁶⁷ In response to these gaps, policy makers can enhance market openness and level the playing field between incumbents and new entrants. This will in turn promote investment and hence competition in the telecommunications sector, with potential positive effects on price and access.

Figure 2.1. APEC fixed broadband basket prices (in PPP\$)



Note: Data for Chinese Taipei was not available; the relatively higher average fixed broadband price in 2013 is a result of an outlier (Papua New Guinea with a fixed broadband price of PPP\$ 441.5 before falling to PPP\$ 54.6 in the following year). Despite this being the case, its exclusion still indicates a similar trend of falling average fixed broadband prices between 2013 and 2017.

Source: International Telecommunication Union (ITU), 'ICT Price Baskets', accessed 12 June 2019, <https://www.itu.int/net4/ITU-D/ipb/#ipbtimeseries-tab>.

⁶⁷ International Telecommunication Union (ITU), 'More and More Governments Now Benchmark Broadband Status in Their National Plans, Says New Global Report', 11 September 2018, <https://www.itu.int/en/mediacentre/Pages/2018-PR25.aspx>.

Box 2.1. Promoting competition and removing barriers to investment to boost connectivity: Lessons from OECD economies

In the past, communication networks across the OECD were typically stand-alone endeavours, with separate firms and business models operating on independent fixed, wireless and broadcasting networks. These services have increasingly converged on IP-based networks or the internet. This means that market players are able to offer combinations of telephony, broadband internet access, wireless services and television. As a result, telecommunication infrastructure often experiences competition issues. There is a need for policy makers to ensure sufficient competition. Some means by which they can do this are outlined below:

1. Policymakers should exercise **caution with potential mergers** that would reduce the number of mobile network operators (MNOs) in a given market considering the results from available studies highlighting the price and non-price effects of such mergers. Experience has shown that economies with a larger number of MNOs, for example those going from three to four operators, are likely to offer more competitive and innovative services, although local conditions vary. Further, proposed remedies should be assessed in terms of whether they effectively ensure competition. Some economies have opted for behavioural remedies such as obtaining commitments from merging parties, while others have facilitated the presence of mobile virtual network operators. Still others have applied structural remedies (e.g., divestment) when other options have been deemed as not effective enough to promote competition. Policy makers should also promote sufficient competition in international mobile roaming.
2. **Infrastructure sharing** is another way to promote competition in telecommunication markets, particularly where markets are characterised by a dominant player. Such policies typically relate to access to passive infrastructure deployed by other actors, whether for operators deploying fibre to gain access to the infrastructure of public utilities, or for new entrants seeking access to passive infrastructure owned by other operators (e.g., dark fibre, ducts and masts). Infrastructure-sharing provisions could reduce costs for network and service providers while enabling the development of new and innovative services for end users. The benefits of infrastructure sharing, however, should be balanced against the potential costs of reduced incentives to invest in the development and maintenance of infrastructure.
3. **Co-investment arrangements**, whereby two or more operators co-invest in network deployment could, in some circumstances, spur coverage and increase competition. Such arrangements have emerged in economies like the Netherlands, Portugal, Spain and Switzerland as a means of sharing risk and overcoming financing constraints. However, the impacts of such arrangements and the ideal conditions for network access for third parties depend on local market conditions and factors such as the number of operators and the areas of co-investment, and the overall effect is unclear at this stage.
4. It is important to ensure the **development of, access to and use of Internet Exchange Points (IXPs)**, to better enable the local exchange of traffic, unburden interregional links and stimulate investment in local networks. Second, it is important to ensure the efficient allocation of spectrums, a scarce natural resource that is increasingly important with the large amounts of data being transmitted over wireless networks. Third, as Perset notes, with the pool of existing unassigned IP addresses close to exhaustion, the relatively slow uptake of the new generation of IP addresses (IPv6) could limit the connection of more devices and machines, although some internet service providers have developed short-term solutions for IPv4 reuse. Other administrative barriers to investment can include licensing requirements and overly complex rights of way permissions to install towers or masts.

Adapted in full or part from:

- OECD, *Going Digital: Shaping Policies, Improving Lives* (Paris: OECD, 2019), <https://doi.org/10.1787/978OECD.9264312012-en>.
- Karine Perset, 'Internet Addressing: Measuring Deployment of IPv6' (Paris: OECD, March 2010), <https://www.oecd.org/internet/ieconomy/44953210.pdf>.

Second, enhanced competition can bring benefits to other sectors (besides telecommunications) that are important for the digital economy. As the section on opportunities and challenges in the digital economy has shown, both the public sector and private sector firms, including MSMEs, can now access a wide range of online services including cloud computing, software-as-a-service (SaaS) and data analytics that can enhance productivity and improve product offerings at a fraction of the cost of developing them in-house. However, some existing policies, particularly those related to data storage, processing and transfer may reduce the access of firms to these services. Alternative services may cost more, making firms in those economies less competitive vis-à-vis their global counterparts.

Box 2.2: Increasing access and fostering competition in the Mexican telecommunication sector

Pre-reform: In 2012, the Mexican telecommunications sector was characterised by a high degree of concentration and high average prices for telecommunication services. A single company controlled 80 percent of the landline phone market in Mexico and 70 percent of the wireless market, while over three quarters of households lacked access to the internet. A review of the sector carried out by the OECD recommended 31 actions to improve competition in the telecommunication market, ensure the consistent and transparent application of telecommunication regulation, improve the legal and regulatory framework and stimulate competition more broadly throughout the economy.

Response: The recommendations were implemented in a wide-ranging reform of the legal and regulatory framework in 2013, fully covering 29 of the 31 listed with partial implementation for just three recommendations. Five years later, the OECD was invited to review the implementation of the recommendations and the effects of the reform of the Mexican telecommunication sector and to put forward a set of further recommendations to maintain the momentum.

Impact: A subsequent OECD Telecommunication and Broadcasting Review in 2017 found that increased competition as a result of the reform helped to drive down prices for telecommunication services in Mexico. The OECD high-usage basket, for example, had the sharpest drop in prices, from USD 101 (PPP) to USD 24.93 (PPP), representing a decline of over three quarters of the original price. Almost 50 million mobile broadband subscriptions had been added since the reform, most of them with higher quality offerings than before. This decline in prices and increase in the quality of telecommunication services especially benefitted lower income households and disenfranchised communities and individuals throughout Mexico. Foreign entry into the marketplace has spurred investment in infrastructure and the *Red Compartida* – a shared wholesale wireless network – will likely further this trend.

Challenges: However, additional efforts will be needed to further increase fixed and mobile access to the internet, an essential precondition for engaging with the digital economy. At the same time, the economy should undertake further efforts in the broadcasting sector, a sector where concentration increased and prices have risen 5 percent over the past few years.

The OECD Telecommunication and Broadcasting Review of Mexico 2017 encourages Mexico to go even further, given an expected further increase of convergence of broadcasting and telecommunication services. Specific recommendations relate to competition, market conditions and economy-wide policies, all underpinned by the necessity to strengthen current legal and institutional frameworks. The OECD believes that the adoption of these recommendations would further expand access to telecommunication and broadcasting services for Mexicans, including for those in communities with lower levels and quality of internet access.

Adapted in full or part from:

- OECD, 'Making the Digital Transformation Work in LAC' (OECD Science, Technology and Innovation Directorate, forthcoming 2019).
- OECD, 'OECD Telecommunications and Broadcasting Review of Mexico 2017' (Paris: OECD, 2017), <https://doi.org/10.1787/9789264278011-en>.

Third, appropriate competition policies can facilitate new market entrants and the uptake of new business models. However, new entrants may find it difficult to compete against incumbent digital economy firms. As an illustration, network effects (i.e., whereby an increase in the number of participants improves the value of a good or service) and other features of the digital economy have led to an increasing number of firms operating in multi-sided markets. Often, the ownership of a primary platform allows firms to collect large volumes of data from users. The data can then be used to improve that firm's services, cross-sell other services and increase its overall profitability. In some cases it may be difficult for new entrants to challenge incumbent platforms.⁶⁸ At the core of these debates are issues such as data sharing, interoperability, portability and ownership. For example, a study by UNCTAD indicates that the sweet spot for data access resides primarily with core platform owners and secondarily with higher-level platforms. Although smaller firms would be able to access their own data and analyse them, access to insights from larger pools of data would have to come at a cost or be entirely at the discretion of the platform owners.⁶⁹ Finding the optimum solution to these issues is not easy. On one hand, providing greater access to data allows for greater competition and innovation in the market.⁷⁰ On the other hand, requiring access to an incumbent's data may diminish the incentive of a platform to invest in data collection, potentially undermining the incentive to innovate.⁷¹

Fourth, the role of technology such as AI on competition is also widely discussed. For example, while AI could lead to benefits such as speeding up R&D activities and lowering prices through automation,⁷² it could also enable first-degree price discrimination (i.e., adjustments of price in real time based on consumers' perceived need for products and willingness to pay⁷³).

Fifth, there remain different views on the applicability of traditional competition policy approaches in the digital economy. On one hand, there are views that the core principles of traditional competition policy are sufficient and flexible enough to be adapted and adjusted to the new characteristics of the digital economy.⁷⁴ On the other hand, others opined that more fundamental adjustments need to be made, such as including different criteria (e.g. the control of data, network effects, switching costs) when assessing market power. In fact, economies are still in the midst of exploring the best approaches to this issue. A case in point is the merger of Grab and Uber, which were reviewed and treated differently in Southeast Asian economies. The Competition and Consumer Commission of Singapore imposed a fine of SGD 13 million on both Grab and Uber for harming competition, while in Indonesia and Malaysia no penalty was imposed.⁷⁵

⁶⁸ David Autor et al., 'Concentrating on the Fall of the Labor Share' (Cambridge, MA: National Bureau of Economic Research, January 2017), <https://www.nber.org/papers/w23108.pdf>.

⁶⁹ UNCTAD, 'The New Digital Economy and Development' (Geneva: UNCTAD, October 2017), https://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d08_en.pdf.

⁷⁰ Daniel Castro and Michael Steinberg, 'Blocked: Why Some Companies Restrict Data Access To Reduce Competition and How Open APIs Can Help', *SSRN Electronic Journal*, 2017, <https://doi.org/10.2139/ssrn.3108763>.

⁷¹ Bernard (Barry) A. Nigro, Jr., "'Big Data" and Competition for the Market' (New York: US Department of Justice), <https://www.justice.gov/opa/speech/file/1017701/download>

⁷² S. Chitturu et al., 'Artificial Intelligence and Southeast Asia's Future' (McKinsey Global Institute, September 2017), <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Artificial%20Intelligence/AI%20and%20SE%20ASIA%20future/Artificial-intelligence-and-Southeast-Asias-future.ashx>.

⁷³ Benjamin Reed Shiller, 'First Degree Price Discrimination Using Big Data' (Brandeis University, Department of Economics and International Business School, January 2014), <https://ideas.repec.org/p/brd/wpaper/58.html>.

⁷⁴ Crémer, de Montjoye and Schweitzer, 'Competition Policy for the Digital Era'.

⁷⁵ UNCTAD, 'Competition Issues in the Digital Economy' (TD/B/C.I/CLP/54, 1 May 2019), https://unctad.org/meetings/en/SessionalDocuments/ciclpd54_en.pdf

Box 2.3. Monitoring changes in competitive dynamics

In the case of competition policy, it is often important to measure **industry concentration** to better understand the level of the competition present in an economy or sector. While an imperfect measure, industry concentration can serve as a proxy to better understand the degree of competition in a given sector or market, as well as changes in the structure of industries. The level of industry concentration may be affected by the mergers and acquisitions that are carried out. Over 2003-2015, the number of global mergers and acquisitions doubled, with a strong increase in cross-border mergers and acquisitions of firms in digital-intensive sectors. The number of cross-border acquisitions of digital-intensive firms grew by more than 40 percent over 2007-2015, compared to 20 percent growth in acquisitions of less digital-intensive firms. These developments may not necessarily be a source of concern, as they may be inherent to the nature of digital transformation, but they should be further examined and considered by policy makers.

Ensuring a competitive environment for both domestic and cross-border transactions is essential. In the cross-border context, **regulatory restrictions on products can be assessed for being excessive or insufficient** compared to restrictions on domestically supplied products. Such an assessment may consider whether an economy's standards are followed by products sold across borders and ensure that illegal products are not made available. Competition in the cross border context includes single firms seeking to sell products across a border and limits on rivalry by a dominant firm or cartels.

Adapted in full or part from:

- OECD, *Going Digital: Shaping Policies, Improving Lives* (Paris: OECD, 2019), <https://doi.org/10.1787/978OECD.9264312012-en>.

In response to these challenges, economies have begun to review and adjust their competition policies and/or introduce policy measures to enhance competition. For example, they have lowered the barriers for new entrants by facilitating the entry of technology firms into heavily regulated sectors and/or those that are typically dominated by brick and mortar firms such as the financial sector. For instance, in 2018, Korea granted preliminary regulatory approval to two online only banks to provide loans to consumers.⁷⁶ Similarly, Australia has issued deposit taking licenses to digital banks.⁷⁷ At the same time, some economies have also put in place measures to ensure that incumbent firms cannot disadvantage new entrants. As an illustration, the Philippines passed a law to allow consumers to take their mobile numbers with them when they switch telecommunication service providers (portability).⁷⁸ Australia has launched the Consumer Data Right (CDR) to allow consumers better control of their banking data. This initiative allows consumers to safely and conveniently move their banking data to other service providers. CDR is expected to be carried out in stages with information including but not limited to mortgage and deposit accounts made available by 2020.⁷⁹ Likewise, Singapore is currently in discussions to introduce a data portability requirement within its Personal Data Protection Act (PDPA). It hopes that this will allow consumers to move information seamlessly across service providers.⁸⁰ To

⁷⁶ 'South Korea to Debut Open Banking in December', Regulation Asia, 17 April 2019, <https://www.regulationasia.com/south-korea-to-debut-open-banking-in-december/>.

⁷⁷ Cherie Marriott, 'How Australia's Virtual Banks Compete with the Giants', FinanceAsia, 25 April 2019, <https://www.financeasia.com/article/how-australias-virtual-banks-compete-with-the-giants/450697>.

⁷⁸ Philippines, 'Republic Act No. 11202 Requiring Mobile Service Providers to Provide Nationwide Mobile Number Portability to Subscribers', *Official Gazette of the Republic of the Philippines*, accessed 21 June 2019, <https://www.officialgazette.gov.ph/2019/02/08/republic-act-no-11202/>.

⁷⁹ Australian Competition and Consumer Commission, 'Consumer Data Right (CDR)', 30 May 2018, <https://www.accc.gov.au/focus-areas/consumer-data-right-cdr-0>.

⁸⁰ Kevin Kwang, 'Singapore Plans Data Portability Requirement as Part of PDPA Update', *Channel NewsAsia*, 25 February 2019, <https://www.channelnewsasia.com/news/singapore/singapore-personal-data-protection-act-portability-rights-move-11287772>.

reap the benefits and overcome the challenges of the home sharing economy including its implications for traditional hotels, Malaysia conducted a study on short term accommodations in 2018 and is currently in the midst of drafting a regulatory framework to better regulate it (see Box 2.4).

Box 2.4. Regulating Malaysia's home-sharing economy

Pre-reform: Homestays⁸¹ have been popular in Malaysia, particularly since the Ministry of Tourism and Culture launched its homestay initiative in 1995. The rise of digital platforms such as Airbnb has contributed to further growth as they provide homeowners with access to a larger market. Indeed, with a 137 percent year-on-year growth in 2017 and a total of 1.5 million bookings, Malaysia is the Asian market with the highest growth rate for Airbnb. While digital platforms have transformed the hospitality industry, traditional players have voiced their displeasure at the advantages these new players often enjoy. Moreover, these unregistered and unrecorded activities have raised questions of safety, with potential negative implications for the growth of the industry. Clear definitions, and regulations on safety and other matters will be needed as the industry continues to grow.

Response: In response, Malaysia conducted a study to provide policy recommendations for short-term accommodation in 2018. The study recommends that the definition of short-term accommodation be enhanced since current laws do not fully capture the nature of the new service. It further adds that a better definition would allow governments to better differentiate between new and traditional service providers. Noting that the home-sharing economy could be added as a new category in the hospitality industry, the study provides a basis for a regulatory framework that addresses issues such as public nuisance, safety, security, change of land use, taxation, registration and licensing. Using recommendations indicated in the study as inputs, Malaysia is currently drafting a regulatory framework for the home sharing economy.

Challenges: Malaysia has noted the following three challenges when implementing reforms to respond to the digital economy: (1) finding the balance between ensuring a level playing field for both existing and new players and creating an enabling environment for the home sharing economy to grow, while at the same time protecting consumer rights; (2) developing effective taxation solutions for online platforms and cloud providers with no or minimal physical presence in the economy; and (3) creating a hybrid regulatory framework which involves multiple government agencies and requires them to work closely with one another.

Source: Adapted from Malaysia's case study submission.

B. Regulatory reform

APEC's work on regulatory reform aims to ensure governments are equipped with institutions and processes that will enable them to put in place effective laws and regulations to maximise the benefits of the digital economy while assessing and managing its risks. In the area of good regulatory practices (GRPs), useful tools include better domestic coordination of rule-making activity, regulatory impact assessment (RIA) and public consultation mechanisms.

A major challenge for regulators is that technologies and business models are evolving faster than policies. There is often a significant gap between technology and policy, with potentially negative implications for businesses and the economy as a whole. The OECD has identified a range of government policies from the analogue era that are ill-adapted to today's digital world.⁸² These include vertical regulations which constrain market entry for digital actors in a range of sectors, such as transport, accommodation and pharmaceuticals; regulations that require a physical presence or

⁸¹ Refers to a form of lodging whereby visitors are hosted in the residence of a local.

⁸² OECD, 'Maintaining Competitive Conditions in the Era of Digitalisation' (Paris: OECD, 2018), 4, <http://www.oecd.org/g20/Maintaining-competitive-conditions-in-era-of-digitalisation-OECD.pdf>.

significant minimum scale; regulations with high regulatory burden in sectors such as banking; and regulations previously intended to address market failures due to information asymmetries.

Firms, especially MSMEs, often face barriers in exporting and in participating in global value chains (GVCs). E-commerce has been touted as a viable alternative channel to internationalisation for such firms. There are indeed many success stories of entrepreneurs who have grown their business both domestically and internationally using e-commerce as a channel. However, it is also true that these success stories are a mere drop in the bucket considering that MSMEs number in the millions and make up the highest share of firms in many economies including in APEC member economies. While many factors can contribute to firms' success in using e-commerce as a channel including the capacity of the firms themselves, a favourable regulatory environment is critical (see Box 2.5). For instance, DeStefano et al. find that regulations pertaining to ease of doing business, ICT and employment protection have significant effects on the uptake of ICT hardware.⁸³

Seamless e-commerce experience requires logistics and payment systems to link buyers, sellers and other actors with a minimum amount of friction. Challenges in any component of the ecosystem will impact e-commerce and hence the market opportunities for firms. A well-functioning payment service requires correspondent banking relationships or agreements between banks as well as payment service providers. While regulations on anti-money laundering and measures to protect against terrorist financing and hackers are important, they may affect discussions pertaining to the establishments of such relationships or agreements. For instance, Mexico, in response to attacks on its electronic interbank payment system (SPEI), tightened the requirements for transfers, making it mandatory for participants to follow protocols in the event of a security breach.⁸⁴ Compliance with such protocols and regulations can be onerous, particularly for MSMEs with limited resources. As a result, they may be forced to offer fewer payment options, limiting their market reach.

⁸³ Timothy DeStefano, Koen De Backer and Laurent Moussiegt, 'Determinants of Digital Technology Use by Companies' (Paris: OECD, 2017), <https://doi.org/10.1787/a9b53784-en>.

⁸⁴ BNamericas, 'Mexico Central Bank Tightens Rules on Electronic Transfers', 27 July 2018, <https://www.bnamericas.com/en/news/mexico-central-bank-tightens-rules-on-electronic-transfers>.

Box 2.5. E-commerce development in Viet Nam

Pre-reform: Viet Nam recognised that e-commerce brings many benefits to firms including MSMEs. For example, e-commerce provides an additional sales channel and promotes the adoption of new business models.

Response: Since 2005, Viet Nam has undertaken structural reform to promote e-commerce development. The following are a few of those reforms:

1. Legitimising e-commerce

Viet Nam passed three main pieces of legislation which lay the legal foundation for e-commerce development, namely the Commercial Law, the Civil Code Law on Information Technology and the Electronic Transaction Law. Collectively, these regulations recognise the value of data messages within civil and commercial transactions, ensure transactions are secure as well as regulate the use and development of information technology and security for e-commerce.

2. Creating an open environment for e-commerce

To create an environment that facilitates e-commerce, Viet Nam reduced the number of licensing regulations through Decree No. 97/2008/ND-CP. The decree also introduced a new regulatory approach, where the government now views the internet as a complementary and modern channel for socio-economic activities instead of being a distinct area that requires special management. Additionally, the introduction of the Telecommunications Law in 2009 led to an improvement in the regulatory approach to the domain name '.vn'.

3. Entering into FTA agreements with clause on e-commerce

Viet Nam has also increasingly participated in trade agreements containing commitments on e-commerce. For instance, Viet Nam has participated in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) which contains an e-commerce chapter with commitments in areas such as consumer protection. Others include the ASEAN Agreement on e-commerce to facilitate cross-border e-commerce transactions in the ASEAN region.

Impact: The reforms have contributed to Viet Nam becoming one of the fastest growing e-commerce markets, with market size increasing from USD 2.2 billion in 2013 to USD 6.2 billion in 2017. These regulations have also led to an increase in competition, as large foreign e-commerce players such as Amazon and Alibaba enter the market, domestic e-commerce players are forced to boost their competitiveness. Consequently, the share of internet users engaging in online shopping has increased from 57 percent in 2013 to 67 percent in 2017.

Lessons learned: Viet Nam indicated that the above reforms have to be complemented with other reforms (e.g., in the telecommunications sector) to achieve its intended objective. It noted that the development of e-commerce is also partly the result of the increase in internet speed and users, which in turn, is due to reforms in telecommunications sector that have led to Viet Nam having 65 licensed internet service providers by the end of 2017.

Source: Adapted from Viet Nam's case study submission.

On the customers' side, the lack of certain documentation may prevent people from opening bank accounts, one of the common criteria needed to make online purchases. For instance, in 2017, the Global Findex Database identified 1.7 billion adults to be unbanked with approximately one fifth of adults citing the lack of documentation and distrust of the financial system as reasons for not having a bank account.⁸⁵

APEC economies are working to reduce some of the payment-related frictions. For example, Brunei Darussalam has developed a digital payment roadmap to balance regulation and innovation, adopt open digital payments and increase public awareness and education.⁸⁶ The roadmap aims to bolster collaboration among market players (including existing financial institutions and prospective payment service providers) and promote market interoperability among others. Indonesia's state owned banks and a telecommunication firm are expected to merge the different payment services into one platform. Under the new platform, users will no longer be required to have a bank account as payments can be made through QR (bar) codes.⁸⁷ In Malaysia, the financial industry has established the Real-time Retail Payments Platform (RPP), a shared payment infrastructure, to enable seamless, interoperable payments between banks and non-banks. A key element under the RPP is an interoperable QR scheme whereby merchants only need to display common QR code to receive payments from customers using any RPP participating bank or non-bank.⁸⁸

Specifically on electronic money or wallet, economies have identified the need for greater regulation to protect consumers, among others, while ensuring that the regulations do not impede the growth of firms providing these services. For instance, Singapore passed the Payment Services Act, which contains consumer protection measures such as requiring major payment institutions to safeguard customer money held in these mobile wallets. The measures aim to minimise the potential risks posed by the payment service providers to consumers.⁸⁹ Indonesia's central bank has introduced regulations where it updated the set of rules for electronic money such as allowing electronic money only to be used for payment instruments for goods and services from the issuer of these e-money among others.⁹⁰ In China, the central bank has imposed a regulation limiting daily mobile transactions conducted via static QR codes to RMB 500 (USD 79) per customer to protect their financial security and prevent scams. Beyond the threshold, dynamic QR codes (which are considered much safer) have to be used for payments.⁹¹

It is important to identify that over-, mis- and under-regulation can impede customer participation in activities such as e-commerce. The OECD has identified several consumer protection issues related to the rise of the digital economy, including: transparency and disclosure; discrimination and choice; privacy and security; interoperability; and accountability.⁹² Among the five areas, accountability featured strongly within e-commerce with the World Economic Forum indicating that trust tends to be more important online than offline given the lack of face-to-face contact. Furthermore, the same report noted that consumers are less likely to participate in online transactions if they were not covered by the

⁸⁵ Asli Demirgüç-Kunt et al., *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution* (Washington, DC: World Bank, 2018),

<https://openknowledge.worldbank.org/bitstream/handle/10986/29510/9781464812590.pdf>.

⁸⁶ Autoriti Monetari Brunei Darussalam, 'Digital Payment Roadmap for Brunei Darussalam 2019–2025', media release, 21 December 2018, <https://www.ambd.gov.bn/Lists/News/Displayitem.aspx?ID=389>.

⁸⁷ Teresa Umali, 'Indonesian State Companies to Merge Mobile Payment Services', OpenGov Asia, 23 February 2019, <https://www.opengovasia.com/indonesian-state-companies-to-merge-mobile-payment-services/>.

⁸⁸ PayNet, 'Real-time Retail Payments Platform (RPP)', <https://paynet.my/fi-rpp.html>.

⁸⁹ 'Parliament: MAS to Regulate More Types of Payment Services such as Mobile Wallets under New Act', *The Straits Times*, 14 January 2019, <https://www.straitstimes.com/politics/parliament-mas-to-regulate-more-types-of-payment-services-such-as-mobile-wallets-under-new>

⁹⁰ Oka Anantajaya and Mochtar Karuwin Komar, 'Bank Indonesia Issues New E-Money Regulation', In-house Community, 20 June 2018, <https://www.inhousecommunity.com/article/bank-indonesia-issues-new-e-money-regulation/>.

⁹¹ ECNS, 'Limit on QR code payments to take effect from April', Ecns.cn, 16 March 2018, <https://www.ecns.cn/cns-wire/2018/03-16/296003.shtml>.

⁹² OECD, 'Challenges to Consumer Policy in the Digital Age' (Paris: OECD, 2019), <http://www.oecd.org/sti/consumer/challenges-to-consumer-policy-in-the-digital-age.pdf>.

same level of protection or did not have access to the same types of remedies.⁹³ In 2017, a survey conducted by the Centre of International Governance Innovation and IPSOS found close to half of respondents indicating that lack of trust was a key reason they did not shop online.⁹⁴ Despite the need for strong consumer protection, UNCTAD found that only 52 percent of economies around the world had some form of consumer protection legislation while within APEC, five out of 19 economies did not have them in place.⁹⁵ In response to these trends, economies have implemented or strengthened laws and regulations whose aims include strengthening consumer protection in the digital economy (see Box 2.6 for China's case study). Regional organisations are also working on strengthening consumer protection, an example being ASEAN through the creation of the ASEAN Strategic Action Plan on Consumer Protection 2025 that aims to modernise consumer protection legislation within member economies.⁹⁶ Similarly, APEC has taken steps toward strengthening consumer protection through means such as Online Dispute Resolution (ODR). It is currently developing the APEC Collaborative Framework for Online Dispute Resolution which aims to help businesses resolve cross border disputes.⁹⁷

Box 2.6: Strengthening consumer protection in China through E-Commerce Law

Introduction: E-commerce is an integral part of China's digital transformation. In 2018, annual e-commerce transaction volume reached RMB31.63 trillion, with online retail sales registering a year-on-year increase of 23.9 percent. Among the benefits of e-commerce to China are boosting consumption, increasing employment, helping combat poverty and developing the world's largest online retail, digital payment and logistics market.

Pre-reform: Despite these benefits, the e-commerce market is impeded by various issues, including:

- asymmetry of technology and information between parties.
- abuse of dominance by some platforms.
- varied product quality.
- privacy and security of consumer data.

These issues have negatively impacted consumer rights and interest, and reduced market competition.

Response: In August 2018, China passed the E-Commerce Law to cover various aspects of e-commerce such as registration of legal entities, responsibility of platform, prohibition of false advertising, protection of intellectual property rights (IPR) and taxation.

The legislation, which came into force in January 2019, includes the following key measures:

- clarifies the legal entities that have to be registered.
- prohibits fictitious transactions, false advertising, fabrication and deletion of reviews.
- prevents abuse of market power.
- clarifies the responsibilities of platform operators and provides legal guidance for dispute handling.

⁹³ World Economic Forum, 'The Global Governance of Online Consumer Protection and E-commerce: Building Trust' (Geneva: World Economic Forum, 2019), http://www3.weforum.org/docs/WEF_consumer_protection.pdf.

⁹⁴ The survey was conducted in 24 economies, involving 24,225 internet users. See: Centre for International Governance Innovation and Ipsos, '2017 CIGI-Ipsos Global Survey on Internet Security and Trust', accessed 15 September 2019, <https://www.cigionline.org/internet-survey-2017>.

⁹⁵ The study does not cover Hong Kong, China; and Chinese Taipei. UNCTAD, 'Summary of Adoption of E-Commerce Legislation Worldwide', accessed 19 September 2019, https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Legislation/eCom-Global-Legislation.aspx.

⁹⁶ Association of Southeast Asian Nations (ASEAN), 'Handbook on ASEAN Consumer Protection Laws and Regulation' (Jakarta: ASEAN Secretariat, June 2018), <https://asean.org/wp-content/uploads/2018/05/Handbook-on-ASEAN-Consumer-Protection-Laws-and-Regulation.pdf>.

⁹⁷ APEC, 'APEC Collaborative Framework for Online Dispute Resolution' (APEC 2019 First Economic Committee Meeting, Santiago, Chile, 2019), http://mddb.apec.org/Documents/2019/EC/EC1/19_ec1_012.pdf.

- requires contracts to be enforced.

Impact: Although it has only been recently implemented, China indicated that the law has played a positive role in regulating e-commerce activities. For example, it has led to the withdrawal of unqualified and non-eligible entities. Additionally, some large purchasers have registered themselves as platforms and are now engaged in legal business activities. E-commerce platforms such as Taobao and Jingdong have also become more proactive in regulating activities conducted on their platforms which includes timely release of guidelines and promotion of credit management.

The law has also been effective in improving contract enforcement, particularly in cases where platforms cancel orders after consumers have made payment. The inspection of 21 e-commerce platforms by the Beijing Consumer Association has led to the identification of 4 non-compliant platforms, with efforts to rectify them so as to safeguard consumer rights and interests. A sample survey of consumers indicated that practices such as bundled sales and deletion of bad reviews have been reduced.

Lessons Learned: The introduction of the E-Commerce Law has improved the regulation within the industry, clarified the responsibilities of the different parties and led to better alignment of processes. Despite the progress made, however, challenges remain. These include improving coordination between laws (e.g., between E-Commerce Law and Anti-Monopoly Laws) and enhancing regulations in specific areas (e.g., implement credit evaluation).

Source: Adapted from China's case study submission

Although data allow firms to better understand the profile of their customers and improve their product offerings, concerns over data privacy and security have dampened participation. Firms and the general public have become concerned about the security of their data following revelations of questionable data practices by some businesses, including sharing of personal data with third parties without consent from the users themselves, and assuring users that their data was well-protected when it was not.⁹⁸ In response, economies are taking steps to improve data privacy and security. For instance, Japan passed a Personal Information Protection Act in 2017 to regulate the transfer of personal information.⁹⁹ Similarly, Thailand passed a Personal Data Protection Act in 2019 which consolidates data protection laws in the economy.¹⁰⁰ At the regional level, economies are also cooperating with one another to explore middle-ground approaches to data-related issues (i.e., with relatively minimal impact on firms' access and use of data and at the same time, supportive of legitimate public policy objectives which encompasses areas such as data privacy and security). Within APEC, the Cross-Border Privacy Rules (CBPR) system is one such mechanism (see Box 2.7).

Box 2.7. APEC Cross-Border Privacy Rules (CBPR) System

The CBPR system is a voluntary, accountability-based certification mechanism which allows certified companies to transfer personal data (inter- and intra- company) among participating APEC economies. It aims to protect consumer privacy as well as facilitate trade and economic integration in the region by ensuring the free flow of data. Currently, there are eight participating economies: Australia; Canada; Japan; Korea; Mexico; Singapore; Chinese Taipei and the United States.

⁹⁸ Dance, LaForgia and Confessore, 'As Facebook Raised a Privacy Wall'; The Straits Times, 'Facebook Says Companies Got Access to Data Only after User Permission'; The Straits Times, 'Facebook Used People's Data To Favour Certain Partners and Punish Rivals'.

⁹⁹ Personal Information Protection Commission, Japan, 'Amended Act on the Protection of Personal Information (Tentative Translation)' (December 2016), https://www.ppc.go.jp/files/pdf/Act_on_the_Protection_of_Personal_Information.pdf.

¹⁰⁰ 'Get Ready: The First Thailand Personal Data Protection Act Has Been Passed', Baker McKenzie, 1 March 2019, <https://www.bakermckenzie.com/en/insight/publications/2019/03/the-first-thailand-personal-data>.

The CBPR applies to the controllers of personal information and is composed of four phases: self-assessment; compliance review; recognition/acceptance; and dispute resolution and enforcement. It is complemented by the Privacy Recognition for Processes (PRP) system, designed to help controllers to identify qualified and accountable data processors, and the APEC Cross-border Privacy Enforcement Arrangement (CPEA), a multilateral arrangement that is the first mechanism in the APEC region for privacy enforcement authorities to voluntarily share information and provide assistance on cross-border data privacy enforcement.

The CBPR has made major progress since its creation and is getting more widely recognised with more APEC economies expected to join the CBPR system. There is also ongoing work to promote interoperability between the APEC and EU certification models. In addition, Canada; Mexico; and the United States have agreed to recognise the CBPR system as a data transfer mechanism in the updated trade agreement between the three parties, the USMCA Agreement.

However, challenges remain. In the United States, the biggest barrier to the growth of the CBPR system remains the high cost of the certification, as the process requires a review from an independent third party certifier (accountability agent). Possible solutions are being explored including an increase in accountability agents and possible domestic reforms to offer enforcement mitigations for certifying entities.

Source: Adapted from the United States' case study submission.

In addition to measures to enhance trust and facilitate payments, economies have tackled issues like accommodating regulations to other new technologies and business models. Specifically in the financial sector, the FinTech Law enacted by Mexico and changes to the regulation and supervision framework for the insurance industry in the Philippines are two such examples (see Box 2.8).

Box 2.8. Regulatory reforms in the financial sector of Mexico and the Philippines

The FinTech Law in Mexico

Pre-reform: Mexico's National Report on Financial Inclusion 2016 notes that only 39 percent of its population had access to formal financial services. Developments in the area of fintech provide opportunities to increase this share. To promote Mexico as an attractive destination for fintech companies, the economy undertook a series of reforms including those embodied in the 2016 National Financial Inclusion Policy.

Response: The reforms have had some success – Mexico had 238 fintech star-up companies at the time the FinTech Law was proposed, and Mexico opined that the Law would allow it to further develop the sector and achieve various objectives such as the introduction of new products and services and greater access to credit for wider segments of its population.

Impact: There is currently no reliable quantitative data on the direct economic impacts of this legal reform as the law has only been enacted for less than two years.

Cloud technology in financial reporting for the insurance industry in the Philippines

Pre-reform: Prior to digitalisation, the regulation and supervision of the Philippines' insurance industry was highly dependent on manual submission and encoding of data. The significant amount of time needed to do so often led to backlogs in the review and examination process, among others. Digital technologies and tools such as cloud computing have enabled the Philippines' Insurance Commission (IC) to improve on this process.

Response: The IC now allows submission of the statutory financial reporting requirements through the cloud. More specifically, life and non-life insurance companies can now submit their quarterly reports (e.g., Financial Reporting Framework, Risk-based Capital (RBC2) and Reserve Valuation Reports) through their cloud accounts connected to the IC. Furthermore, the IC is currently developing the Financial Examination Database System (IC-FEDS), which will allow it to better access and evaluate the financial reports submitted by these companies as well as their entire operations on a real time basis.

Impact: The change in the regulatory framework has made it possible for companies to be evaluated more regularly (quarterly vs. annually).

Source: Adapted from the case study submissions from Mexico and the Philippines.

Understanding that compliance with traditional regulatory approaches might be challenging for digital-economy firms employing new business models, many economies have introduced regulatory sandboxes to allow such firms to try out their ideas.¹⁰¹ Some examples of best practices on regulatory sandboxes which economies may wish to consider include: 1) having specific and clear entry conditions; 2) ensuring information to participants of regulatory sandboxes are clear and publicly available; 3) requiring firms to disclose to consumers that they are currently participating in a sandbox and the possible implications of receiving services from the firms; and 4) requiring firms to develop plans for controlled exits to better protect consumers.¹⁰² The use of regulatory sandboxes are particularly pertinent in highly regulated sectors such as finance and health. For instance, Russia and Chinese Taipei have each launched a fintech regulatory sandbox to help their institutions experiment with innovative financial products.¹⁰³ (see Box 2.9 and Box 2.10 for Chinese Taipei and Russia's case studies, respectively). These have included innovations in the area of loans,¹⁰⁴ blockchain and cryptocurrencies.¹⁰⁵ Additionally, some APEC economies have recognized e-signatures for general business use.

¹⁰¹ A regulatory sandbox is a regulatory approach which allows for live, time-bound testing of innovations under a regulator's oversight. For more details, see United Nations Secretary-General's Special Advocate for Inclusive Finance for Development (UNSGSA), 'Briefing on Regulatory Sandboxes' (2017), <https://www.unsgsa.org/files/1915/3141/8033/Sandbox.pdf>.

¹⁰² European Supervisory Authorities, 'FinTech: Regulatory Sandboxes and Innovation Hubs' (European Union, 2018), https://www.esma.europa.eu/sites/default/files/library/jc_2018_74_joint_report_on_regulatory_sandboxes_and_innovation_hubs.pdf.

¹⁰³ Shih-ching Kao, 'First Sandbox Experiment Approved', *Taipei Times*, 19 September 2018, <http://www.taipetimes.com/News/biz/archives/2018/09/19/2003700677>; Bank of Russia, 'Запуск Регулятивной Площадки Банка России' [Bank of Russia Launched Regulatory Sandbox], 19 April 2018, <http://cbr.ru/Press/event/?id=1765>.

¹⁰⁴ Kao, 'First Sandbox Experiment Approved'.

¹⁰⁵ Based on Russia's IER Submission on Sandboxes.

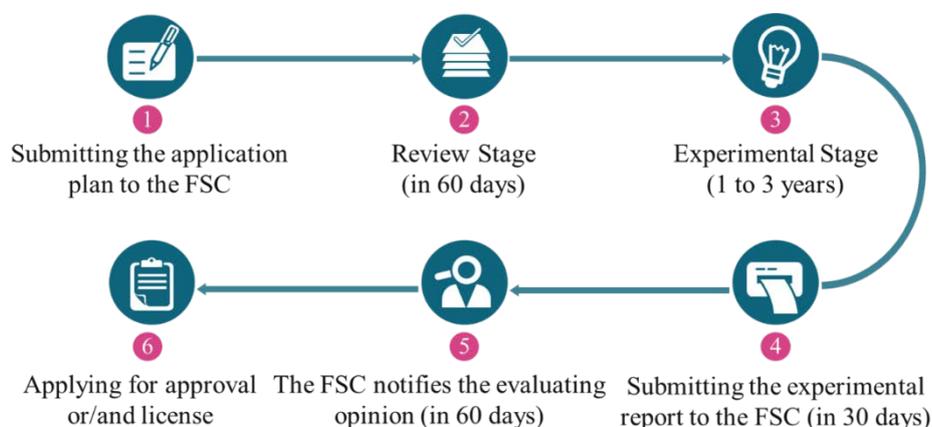
Box 2.9. The FinTech Innovative Experimentation Mechanism in Chinese Taipei

To promote financial inclusion and the development of financial technology (fintech), Chinese Taipei has established a regulatory sandbox mechanism under the Financial Technology Development and Innovative Experimentation Act, which came into force on 30 April, 2018. The Act aims to provide a safe environment for trials of fintech under development, assisting innovators to test and realize their innovative ideas and to accelerate the entry of innovative products or services into the market. Under this mechanism, fintech innovators are exempt from related criminal and administrative liabilities and applicable regulations during the period of experimentation.

The application and experiment process (see Figure 2.2.) includes:

- 1) **Application stage:** The applicant submits the experiment plan and other required documents to the Financial Supervisory Commission (FSC).
- 2) **Review stage:** The FSC decides to approve or reject the application and notifies the applicant of the decision within 60 days of receiving the application.
- 3) **Experimentation stage:** The applicant begins conducting the innovative experiment within three months of receiving the review decision. The length of experimentation is up to one year, with a one-time extension of six months available. If the contents of the experiment involves the need to amend regulations, the total experiment period can be extended to a maximum of three years.
- 4) **Reporting of experiment results:** The applicant reports results to the FSC within one month of the expiry of the experiment period.
- 5) **Experiment results assessment stage:** The FSC completes its assessment, and provides suggestions within 60 days of receiving the experiment results documents.
- 6) **Application for permission for business operation:** Permissions for business operation will be made according to existing or amended financial regulations.

Figure 2.2. The application and experimentation process for the FinTech Innovative Experimentation Mechanism



Accompanying measures were introduced to ensure the experiments are properly guided and related regulations are reviewed and revised accordingly. The FSC has set up the Financial Technology Development and Innovation Center to provide consultation and guidance to applicants. An inter-agency cooperation mechanism has also been set up. If the experiment involves business activities that are under the purview of another agency, the FSC will consult the agency involved for opinions and request a representative to join the review committee. The Center has also established a consultative group discussing cross-agency policies and the revision of related regulations.

Similar to the regulatory sandbox for fintech, Chinese Taipei has passed the Unmanned Vehicles Technology Innovative Experimentation Act. Within a certain range and under certain conditions, it provides temporary exemption of related regulations so as to promote innovative experimentation of the technical, service and/or business operation models of unmanned vehicles (i.e., automobile, aircraft, ship or any combination of these items) in a real-life environment.

Source: Adapted from Chinese Taipei's case study submissions.

Box 2.10. Regulatory sandboxes in the Russian Federation

Russia's draft law on experimental legal frameworks (regulatory sandboxes) aims to establish the procedures for initiating, establishing, implementing and monitoring the outcomes of controlled legal experiments pertaining to the use of digital innovations and other related activities within the economy.

The draft law defines innovation as a new tool based on big data technologies, neurotechnology and artificial intelligence, blockchain systems, quantum technologies as well as other technologies that are defined by the legal acts of the Russian Federation to belong to the category of digital technologies, the realm of the digital economy or a new form of use for existing systems.

The experimental legal framework establishes normative regulations for digital technologies and services when:

- There is no active regulation for the specific technology/service in the economy ('trial experimental regime').
- There are some legal barriers to the implementation of the technology/service in the economy such as restrictions and special conditions ('alternative experimental regime').

Key principles of these experimental legal frameworks are:

- 1) Reasonable minimisation of deviations from the existing legal regulation
- 2) Risk-minimisation relating to consumers
- 3) Newly introduced regulatory requirements do not apply to the participants of experimental legal frameworks during the test period if they put participants in a more disadvantaged position.

As such, these experimental legal frameworks allow different stakeholders (e.g. innovative companies, entrepreneurs, executive and local administrative authorities) to test their products/services in a limited market without adhering to mandatory regulations. Following analysis of the outcome, successful solutions may then be extended to the entire economy.

One institution that has developed a framework for regulatory sandboxes is the Bank of Russia, which launched it in April 2018. The key goals of the sandbox are:

- Development of financial technologies
- Improving the security of innovative services
- Promoting a competitive environment
- Increased financial inclusion
- Development of regulatory mechanisms

Most of the projects currently undertaken within the sandbox framework are those pertaining to blockchain or distributed ledger technology; crypto-assets or cryptocurrencies; and the digitalisation of certain processes related to the provision of financial services to clients.

If the tested product or service is deemed to be successful, a roadmap is developed to ensure the creation of the necessary legal framework for the launch of the product/service in the market.

Source: Adapted from Russia's case study submissions, Ministry of Economic Development, Russia and the Bank of Russia

The above approaches are not mutually exclusive and some economies have employed a combination of approaches concurrently to modernise their financial sector and ensure that it is digital economy-ready. Box 2.11 provides insights from Chile's financial sector.

Box 2.11. Chile's financial sector reforms

Chile has undertaken several regulatory reforms in its financial sector to support innovation and new business models, including gearing the sector to become digitally ready among others.

1. General Banking Law Reform

In 2018, the Chilean Congress approved major reforms to the General Banking Law to modernise and boost the international competitiveness of the financial sector. Key reforms include: (1) consolidating banking, insurance and securities regulatory functions under a single body, the Financial Market Commission (CMF); (2) adapting capital requirements to Basel III standards; (3) providing a new range of tools to the regulator to deal with unstable or weak banks; and (4) extending government guarantees to term deposits. Besides ensuring the stability of the financial system and removing barriers to funding and investment by foreign banks, the reforms are also collectively expected to allow entrepreneurs and MSMEs to better access funding.

2. Law no. 20,590 on means of payment

In 2016, Law no. 20,590 on means of payment came in to force. Under this law, the government and non-banking firms are authorised to provide funds or other similar system (e.g., prepaid cards). This reform creates room for greater innovation in the financial sector as it enables fintech companies to participate more extensively in creating alternative payment methods.

3. Fintech bill

While it is critical to create an enabling environment that is supportive of innovation, Chile recognises that it is also important to ensure the stability of the financial sector and protect its users. It thus introduced the fintech bill to regulate cryptocurrencies and fintech activities. To ensure that the regulation does not become cumbersome and impede the growth of the industry, it aims to be flexible and take into consideration the range of business models and risks of the different services provided.^a

The Chilean Central Bank also released its strategic plan for the year 2018–2022 which identified a Technology Observatory, TechLab and FinLab as potential means to better understand, manage and incorporate technological change.^b

1. Technology Observatory

Chile created the Technology Observatory to strengthen knowledge, coordination and information sharing with both the Chilean fintech community and abroad.^c The Technology Observatory aims to: (1) agree on common principles and contribute to coordination within the bank for the treatment of digital technologies; (2) promote and contribute to knowledge on innovation; and (3) create networks to build knowledge, identify opportunities and threat.

2. TechLab and FinLab

The aim of TechLab and FinLab is to develop regulatory capabilities to address disruptive technologies. TechLab aims to support the central bank in adopting emerging technologies to both maintain the quality and availability of services, while FinLab aims to enhance the regulatory framework in line with technological advances within the financial industry.

CMF issued a White Paper in February 2019 that, focuses on the relevance of having a regulatory framework for crowdfunding and related services in Chile. The paper also contains general guidelines that the relevant authorities should consider when designing such a framework. The development of this document took into consideration the experiences of foreign jurisdictions regarding the regulation of crowdfunding and fintech, and the principles and recommendations issued by international organisations. Additionally, the process took into account the experience and problems faced by the financial industry in Chile, the opinions and points of view of fintech companies, law firms, academics and other actors in the local capital market. The CMF has also signed collaboration agreements with foreign authorities to facilitate the exchange of information, experience, and knowledge related to the development of the fintech ecosystem.

Source: Adapted from Chile's IER, case study submission and other sources.

^a Adrian Zmudzinski, 'Chilean Government Introduces New Cryptocurrency and Fintech Regulation Bill to Congress', Yahoo! Finance, 21 April 2019, <https://finance.yahoo.com/news/chilean-government-introduces-cryptocurrency-fintech-125900811.html>.

^b Central Bank of Chile, *Strategic Plan for 2018–2022: A Project for All* (Central Bank of Chile, 2018), https://www.bcentral.cl/documents/145129/150750/pe2018_eng.pdf/4296cb0e-e729-9bd9-0015-f1bd7a063f0a.

^c International Monetary Fund (IMF), 'Chile: 2018 Article IV Consultation – Press Release; Staff Report; and Statement by the Executive Director for Chile' (IMF Country Report no. 18/311, November 2018), <https://www.imf.org/~media/Files/Publications/CR/2018/cr18311-Chile-Bundle.ashx>.

Although these are steps in the right direction, the development of further regulatory tools and approaches will likely be required. For instance, some have questioned the scalability of sandboxes. Others have observed that there is generally no or little alignment of sandbox frameworks across economies. Regulations on the use of e-signatures (and by extension e-contracts) also vary by individual APEC economies, which may increase the difficulty and cost of cross-border online contract fulfilment (see Table 2.1).¹⁰⁶

Table 2.1. E-signature legal model in APEC economies

Economy	E-signature legal model
Australia	Open
Brunei Darussalam	Tiered
Canada	Open
Chile	Tiered
China	Open
Hong Kong, China	Tiered
Indonesia	Tiered
Japan	Tiered
Korea	Tiered
Malaysia	Tiered
Mexico	Tiered
New Zealand	Open
Papua New Guinea	n.a.
Peru	Tiered
The Philippines	Tiered
Russia	Tiered

¹⁰⁶ 'eSignature Legality Guide', DocuSign, accessed 2 June 2019, <https://www.docusign.com/how-it-works/legality/global>.

Singapore	Tiered
Chinese Taipei	Tiered
Thailand	Tiered
The United States	Open
Viet Nam	Tiered

Note: Tiered economies recognise qualified electronic signatures (QES, or the locally named equivalent) as a distinct type of eSignature. In these economies, a QES has special legal status in the form of presumed authenticity, and may be legally required for a few, specific transaction types. On the other hand, open economies have no such technology requirements or eSignature types that receive special legal status.

Source: DocuSign

While digital technologies and tools have brought benefits, they have also facilitated the spread of disinformation and harmful content, including incitement to commit acts of terrorism. Although evaluating the spread of disinformation is beyond the scope of this paper, there is value in highlighting initiatives that economies have undertaken in this regard. Some economies have enacted or are in the midst of enacting regulations to protect domestic security and combat extremism, among others. For example, some economies are introducing legislation¹⁰⁷ that requires technology firms to either correct or remove inaccurate content. Others have started designing guidelines to aid technology firms in better responding to objectionable material online.¹⁰⁸ Despite the strides made in preventing the spread of disinformation, the question of how legitimacy of content will be determined and enforced is still to be answered.

C. Ease of doing business (EoDB)

The EC's work on EoDB aims to improve the overall business environment in the Asia-Pacific region. The latest EoDB program (2016-2018) focused on making it easier for firms to start a business, get credit, trade across borders, enforce contracts and deal with permits. Regardless of whether firms operate in the traditional economy or the digital economy, success depends partly on policymakers' ability to nurture a better business environment.

Economies' IER submissions show that economies have continued to facilitate starting a business in various ways. For example, Chile has created an electronic registry through its 'your business in a day' regulations that, allows people to set up, modify, transform, merge and dissolve legal entities. Through Government Regulation no. 24/2018, Indonesia has allowed a single electronic submission for all types of business licenses, hence simplifying the business licensing process. Business registrations in Papua New Guinea can now be done online with a turnaround time of less than a day. Despite these laudable efforts, more can be done to ensure that business environment evolves together with the changing economy.

One opportunity brought about by the advent of digital technology and tools is the ability to try out new businesses from home. However, this requires supportive business regulations that in some economies are in their infancy in this regard. For example, PSU notes that in one APEC economy, firms cannot use a home address to apply for a value-added tax (VAT) registration number, making it harder to register and operate their businesses.¹⁰⁹

¹⁰⁷ Yuen-C Tham, 'Parliament: Fake News Law Passed after 2 Days of Debate', *The Straits Times*, 8 May 2019 (updated 9 May 2019), <https://www.straitstimes.com/politics/parliament-fake-news-law-passed-after-2-days-of-debate>.

¹⁰⁸ Some examples include Eleanor Ainge Roy, 'Christchurch Call: Details Emerge of Ardern's Plan to Tackle Online Extremism', *Guardian*, 13 May 2019, <https://www.theguardian.com/world/2019/may/13/christchurch-call-details-emerge-of-arderns-plan-to-tackle-online-extremism>; Corinne Reichert, 'Canada Launches Digital Charter to Combat Hate Speech and Fake News', *CNET*, 21 May 2019, <https://www.cnet.com/news/canada-launches-digital-charter-to-combat-hate-speech-and-fake-news/>.

¹⁰⁹ Gloria O. Pasadilla and Andre Wirjo, 'Globalization, Inclusion, and E-Commerce: APEC Agenda for SMEs' (Singapore: APEC, February 2018), <https://www.apec.org/Publications/2018/02/Globalization-Inclusion-and-E-Commerce---APEC-Agenda-for-SMEs>.

Furthermore, regulations in some economies may inadvertently preclude foreign firms from participating in the e-commerce market. For instance, there may be regulations requiring listed sellers on domestic e-commerce platforms to be registered domestically. MSMEs, unlike aggregators (i.e., intermediary firms with sellers' accounts in various marketplace platforms, have experience in traditional trade and cross-border e-commerce and network relationships with logistics service providers, among others) or their larger counterparts may not have the resources to register and comply with differing regulations in other economies, may be shut out of international e-commerce opportunities. Even where regulations are not onerous, firms may have difficulty understanding e-commerce requirements in various jurisdictions and may be reluctant to operate internationally.

Although digital technology and tools have facilitated transactions (i.e. they would be considered *digitally enabled*), a significant share of products, especially goods are not digitally delivered. Thus, overcoming obstacles related to non-digital trade remains critical for the digital economy to operate efficiently. Cross-border e-commerce provides an avenue for buyers to access products that are not locally available, as well as for MSMEs to access new markets. However, compliance with border processes may be a challenge for some firms, especially MSMEs. Economies are taking steps to improve the situation. For example, Thailand has introduced a system that matches cargo electronically with the goods control list to reduce document inspection time. This initiative has been successful in reducing the time required for border compliance¹¹⁰ from 3-4 minutes to 30-40 seconds.¹¹¹ The ASEAN single window, first implemented by Indonesia; Malaysia; Singapore; Thailand; and Viet Nam, expedites cargo clearance and reduces paperwork.¹¹² OECD work on Single Windows indicators highlights the ongoing efforts of APEC economies in implementing such mechanisms, with notable progress achieved with respect to Single Windows legal frameworks and technological architecture, but with significant challenges remaining across institutional aspects and interoperability.¹¹³

There is considerable discussion on the extent to which current practices, regulations and approaches to structural reform are capable of responding to the changes brought by the explosion of e-commerce and new technologies. For example, considering the increase in the number of small packages that customs officials have to clear, would the practice of randomly selecting a certain pre-determined share of packages for inspection still be viable? In some economies where the import of certain products are regulated and require relevant authorities to provide certification prior to the release of products, would the relevant officers be able to certify the increasing number of such products within a reasonable timeframe? Some economies are already adopting innovative approaches to address customs challenges. For instance, China is experimenting with the use of artificial intelligence technology to screen packages.¹¹⁴ However, as such policies and innovations are still mostly in the experimental or pilot stage, their effectiveness is limited for now. For instance, the e-commerce lane in China may be used only for a specific list of products and may not be based on an international harmonized system of classification.

The rise of e-commerce has challenged the traditional tax collection mechanisms, as many of the transactions may not be covered or taxed. In response, some economies are starting to implement forms of e-commerce tax (either as an entirely new form of taxation or as an expansion of their current tax regime). For instance, Malaysia has introduced a digital tax on the electronic commerce sector of the

¹¹⁰ Somruedi Banchongduang, 'Doing Business Score up, but Ranking Slips to 27th', *Bangkok Post*, 2 November 2018, <https://www.bangkokpost.com/business/news/1568782/doing-business-score-up-but-ranking-slips-to-27th>.

¹¹¹ Wichit Chantanusornsiri, 'Customs Improvements to Lift Ranking', *Bangkok Post*, 17 November 2017, <https://www.bangkokpost.com/business/finance/1361767/customs-improvements-to-lift-ranking>.

¹¹² Yan Min Chia, 'Digital Platform Improves Customs Clearance', *The Business Times*, 26 April 2018, <https://www.businesstimes.com.sg/hub/asean-singapore-2018/digital-platform-improves-customs-clearance>.

¹¹³ OECD, 'Trade Facilitation and the Global Economy' (Paris: OECD, 2018), <https://doi.org/10.1787/9789264277571-en>.

¹¹⁴ 'Customs Using AI Technology To Keep up with E-Commerce Boom', *China.Org.Cn*, 6 March 2019, http://www.china.org.cn/china/NPC_CPPCC_2019/2019-03/06/content_74537486.htm.

economy.¹¹⁵ Singapore plans to impose the Goods and Service Tax (GST) on imported services (including B2C supplies of imported digital services) starting in 2020.¹¹⁶ Australia extended GST to imported digital products and services in 2017 and to low value imported goods in 2018. At the international level, the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS) is working on addressing the tax challenges arising from the digitalisation of the economy (see the Section on Fiscal Policy and Box A.1 in Annex A). As economies increasingly explore new models to tax and regulate the digital economy, it is important to ensure that they are implemented in a way that supports rather than impedes the growth of digital economy firms. This can include making reference to ongoing work by the international organisations mentioned above, as well as calling governments to enhance their public sector governance which is addressed in the section below.

D. Public sector governance

Public sector governance refers to the structure, laws, regulations and decision-making processes that pertain to the provision of goods and services by the government and institutions and policies that ensure the government's long-term financial sustainability. It also includes open government initiatives, government procurement and the provision of basic public services such as health and education, including through the use of electronic means.

Incorporating digital technologies and tools in the delivery of public services increases efficiency, reduces fraud and allows governments to employ data analysis to identify as well as analyse societal trends.¹¹⁷ The importance of digitalising government services has been identified by multilateral organisations such as the World Bank and this has led to programmes such as the GovTech Global Initiative in 2019. Under the initiative, a whole-of-government approach toward digitalisation is promoted, with the aim of improving service delivery and transparency, among others.¹¹⁸

One way governments have adopted technologies is through the **creating one-stop online government portals**, hence providing a single point of access for all public services. Among APEC economies, Hong Kong, China has created an online portal allowing citizens to access information from more than 850 e-government services as at end of 2018.¹¹⁹ Russia has made improvements to its public service portal so that it covers a wider range of services (see Box 2.12). Online portals have also been useful during times of emergencies. For instance, in the United States, the Disaster Assistance Improvement Programme (DAIP) has created an online portal to provide those affected with information on available programmes and help to determine their eligibility for benefits.

Box 2.12. Russia's public service portal

Pre-reform: The Russian government introduced the Electronic Russia 2002-2010 programme as part of a public administration reform process. Russia had initially focused its efforts on developing e-government infrastructure where the portal (ogic.ru) only contained a list of public services,

¹¹⁵ 'Parliament Passes Digital Tax Bill, Enforced Jan 1', *Malay Mail*, 8 April 2019,

<https://www.malaymail.com/news/malaysia/2019/04/08/parliament-passes-digital-tax-bill-enforced-jan-1/1741049>.

¹¹⁶ Kevin Kwang, 'Budget 2018: GST To Be Imposed on Digital Services from 2020', *Channel NewsAsia*, 19 February 2018, <https://www.channelnewsasia.com/news/singapore/budget-2018-gst-to-be-imposed-on-digital-services-from-2020-9970756>.

¹¹⁷ World Bank, 'GovTech: Putting People First', accessed 19 September 2019,

<https://www.worldbank.org/en/topic/governance/brief/govtech-putting-people-first>; GSMA and Boston Consulting Group, 'Embracing the Digital Revolution: Policies for Building the Digital Economy' (GSMA, February 2017),

https://www.gsma.com/publicpolicy/wp-content/uploads/2017/02/GSMA_DigitalTransformationReport2017_Web.pdf.

¹¹⁸ World Bank, 'GovTech'.

¹¹⁹ Legislative Council of Hong Kong, China, 'E-Government Services' (LC paper no. CB(1)1135/18-19(03), 10 June 2019), <https://www.legco.gov.hk/yr18-19/english/panels/itb/papers/itb20190610cb1-1135-3-e.pdf>

application forms in pdf formats and links to other government sites. However, it has identified the need to do more.

Response: In response, Russia launched a new public service portal, where it expanded the information provided to contain full information on 565 federal and 2,282 regional public services, including the list of required documents and application forms. In its second phase, public service delivery has been improved by allowing public services to be offered directly through the portal and by creating multifunctional centres to deliver these services. Additionally, to facilitate better information and communication, Russia has established an interagency system for electronic communication and created a document management system. The portal continues to be updated with new services, including choice of polling station; registration of marriage and birth; and by allowing parcels and registered letters to be received via an SMS (short messaging system) code (through the mobile application Gosuslugi Business).

Impact: The improvements have been successful in increasing the number of federal and municipal services provided digitally. The number of individuals using the public service portal and online federal and municipal services have grown to 86 million and 80 million users, respectively as of 2018. Furthermore, electronic forms are increasing in popularity with more than 60 million users filling them online in 2018. Payments have also been increasingly made through the portal with the value increasing from RUB 8.1 billion in 2016 to RUB 52.6 billion in 2018.

Source: Adapted from Russia's case study submission

Another example of adoption of technology by government is the use of cloud computing services to achieve cost savings for government agencies.¹²⁰ Additionally, digital technologies and tools are employed to deliver key services such as education, health and social assistance to individuals located away from centres of administration and/or in remote areas (see Box 2.13 for Indonesia's social assistance disbursement programme), thus helping to narrow the rural–urban divide. Governments could also use online portals to streamline applications for product standards, so that firms can apply for them regardless of location.¹²¹

¹²⁰ GovTech Singapore, 'Leveraging Commercial Cloud To Accelerate Digital Transformation', accessed 17 June 2019, <https://www.smartnation.sg/docs/default-source/press-release-materials/commercial-cloud-factsheet.pdf>.

¹²¹ Elijah Felice Rosales, 'DTI's Product Certification Goes Online', *BusinessMirror*, 14 April 2019, <https://businessmirror.com.ph/2019/04/14/dtis-product-certification-goes-online/>.

Box 2.13: Transformation of Indonesia's social assistance disbursement

Pre-reform: Indonesia provides social assistance programs to the poor and vulnerable to meet basic needs, ensure social welfare and reduce poverty. Prior to 2017, most assistance programs were distributed in the form of cash or goods/services and beneficiaries had to wait in line at the disbursement location at the predetermined schedule. Such disbursement mechanisms pose challenges for the governments as well as the beneficiaries. Disbursement to remote areas and islands was time-consuming and involved considerable costs and risks for government while the irregularity of the timing and amount made it harder for beneficiaries to manage their finances. Moreover, the quality of goods and services received often did not meet the expectations of beneficiaries.

Response: Recognising that the disbursement of social assistance could be made more efficient, timely and targeted, and in response to the Direction of the President of the Republic of Indonesia issued in April 2016, the Indonesian government transformed the disbursement from cash into non-cash by:

1. **Strengthening the legal basis.** Presidential Decree no. 63 issued in 2017 regulates the principles of disbursement, the mechanism and the role of the regional government among others.
2. **Developing a non-cash social assistance business model.** A business model for non-cash social assistance was formulated to ensure the sustainability of the programme. It covers the process of registration or account opening, the process of disbursement and withdrawal, and the development of materials to raise awareness about the programme.
3. **Improving infrastructure.** Appointed banking agents and branchless banking could act as delivery channels. The Combo Card was created as a payment instrument that can function as both electronic money and a basic savings account.
4. **Strengthening coordination.** The government formed an intergovernmental control team responsible for coordinating, monitoring, evaluating and reporting on the implementation of the Non-Cash Social Assistance Program.

Impact: The implementation of non-cash social assistance disbursement started as a pilot with the Conditional Cash Transfer Programme (PKH) in 2016. Since then, the number of beneficiaries has increased from 1.2 million in 2016 to 10 million in 2019. It also covers more cities/regencies (48 in 2016 vs. 514 in 2019). Non-cash disbursement has been extended to another programme, the Non-Cash Food Assistance Programme (BPNT), benefiting 15.6 million people in 514 cities/regencies.

Generally, non-cash disbursement has improved the governance of social assistance disbursement, payment security and transparency and has enhanced beneficiaries' capacity to manage risk and control their benefits. The BPNT has promoted women's economic empowerment by providing women with business opportunities.

Challenges and lessons learned: Although Indonesia has made significant progress, challenges remain. These include:

- **Infrastructure.** Coverage of the telecommunication network and access to electricity.
- **Data.** Management of beneficiaries' data including accuracy and quality.
- **Financial literacy.** Capacity of beneficiaries to access the funds.
- **Harnessing technological advancements.** Employment of technology to monitor the effectiveness and efficiency of the programmes.

Key takeaways from Indonesia's experience include the importance of:

- Regulation and supporting policies to implement programmes in an effective and efficient manner
- Strong and sound coordination in ensuring synergy
- Balancing the benefits and risks of innovation
- Raising awareness about various aspects of the programme to improve utilisation.

Source: Adapted from Indonesia's case study submission

Tools such as electronic/digital identification (eID) have enabled the government to reach and therefore provide more targeted support to specific groups. By creating a unique, digital identification for each individual, economies have made it possible for welfare payments to be digitally accessed. In some economies, the provision of eID has allowed government agencies, private firms and service providers to determine if holders are entitled to discounts, free basic necessities, etc. Examples of economies introducing electronic identification include: Australia (which has rolled out a pilot program to create a digital identity that would allow citizens to access government services online);¹²² Chile (which is awarding a 10-year concession contract to both upgrade its national identity system and issue electronic IDs and passports by 2020);¹²³ and Malaysia (which is expected to launch a digital identification initiative as part of its efforts to eliminate fraud in public services; this will complement the current physical identification card issued to citizens age 12 and above).¹²⁴ While there are significant benefits to the use of such identification, it is important that governments consider issues including but not limited to security, sustainability and technical obsolescence when introducing electronic identification.¹²⁵

Digital tools and data analytics can enhance public health and the delivery of health services by reducing the cost of medical treatment, predicting and mapping epidemic outbreaks, and helping to identify strategies to avoid preventable diseases. Telehealth services can improve human resource allocation and offer health services in remote communities that do not have hospitals and certain types of specialists. An electronic health records system that respects patients' privacy can greatly improve the efficiency of healthcare systems and help economies find ways to address rising healthcare costs.¹²⁶

Digital technology and tools also allow government to enhance policy design, experimentation, implementation, monitoring and evaluation among others.¹²⁷ They have enabled policymakers to better undertake stakeholder consultations. Digital technology can also be used to enhance the dissemination of data as well as information to individuals and businesses. For instance, Viet Nam is increasing its transparency and availability of information by creating an online law book case that is expected to be completed by 2020.¹²⁸ Furthermore, the analysis of data gathered via these tools has provided another avenue for the government to monitor and evaluate policies and make evidence-based adjustments if necessary.

In addition to harnessing digital tools to improve services, governments can act as an agent of change to encourage the increased use of such technologies and tools by the private sector and society as a whole. One area where governments can be a trailblazer is the promotion of data sharing. As the custodian of a large amount of public data, governments can encourage the use of its datasets for the provision of innovative, citizen-centric services. They can do so via open data policies (see Box 2.14 for Canada's efforts at creating an open government). Open data policies in many economies are based mainly on eight principles, namely that the data should be: (1) complete; (2) primary; (3) timely; (4) accessible; (5) machine-processable; (6) non-discriminatory; (7) non-proprietary; and (8) licence-free.

¹²² Digital Transformation Agency, Australia, 'Easier Access to Online Government Services', 24 July 2019, <https://www.dta.gov.au/our-projects/digital-identity/easier-access-online-government-services>.

¹²³ GSMA, World Bank Group and Security Identity Alliance, *Digital Identity: Towards Shared Principles for Public and Private Sector Cooperation* (World Bank, 2016), <https://doi.org/10.1596/24920>.

¹²⁴ Alita Sharon, 'Malaysian Citizens To Get a National Digital ID', OpenGov Asia, 13 October 2018, <https://www.opengovasia.com/malaysian-citizens-to-get-a-national-digital-id/>.

¹²⁵ ITU, *Digital Identity Road Map Guide* (Geneva: ITU, 2018), https://www.itu.int/en/ITU-D/ICT-Applications/Documents/Guides/ITU_eID4D_DIGITAL%20IDENTITY_ROAD_MAP_GUIDE_FINAL_Under%20Review_Until-05-10-2018.pdf.

¹²⁶ Mona Lebied, '12 Examples of Big Data in Healthcare that Can Save People', The Datapine Blog, 18 July 2018, <https://www.datapine.com/blog/big-data-examples-in-healthcare/>.

¹²⁷ OECD, 'Going Digital: Making the Transformation Work for Growth and Well-Being' (Paris: OECD, 2017), <https://www.oecd.org/mcm/documents/C-MIN-2017-4%20EN.pdf>.

¹²⁸ Linh Phi, 'PM Approves Project Applying IT in Law Dissemination and Education', *Vietnam Economic Times*, 5 March 2019, <https://vneconomicstimes.com/article/vietnam-today/pm-approves-project-applying-it-in-law-dissemination-and-education>.

For instance, the Open Government Partnership (OGP) is a global open data initiative where participating economies pledge greater access to government information.¹²⁹

Box 2.14. Creating Open Government in Canada

Pre-reform: Canada has made efforts to support disclosure of public information in the past (e.g., through the Access to Information Act in 1983 and the Federal Accountability Act in 2006), and it has identified several benefits associated with such disclosure:

- **Advance government accountability and democratic reforms** by providing more information on government activities, programmes and expenditure
- **Support research and private sector innovation** by allowing individuals to better use public sector data
- **Support engagement and informed decisions by citizens** by enhancing their access to a range of government initiatives and public services, and by allowing them to better communicate their view on policies.

Response: The Canadian government introduced several policies such as:

1. **Open Government Initiative.** As part of the initiative, Canada has released four economy-wide action plans on open government that serve as frameworks for reforms. Additionally, in May 2019 it hosted the 6th OGP Global Summit as co-chair of the OGP Steering Committee with a focus on championing inclusion, protecting participation and delivering impact for digital democracy.
2. **Open Data and Information.** With the creation of its open data and information portal (Open.Canada.Ca), Canada has released information from federal departments. The release was primarily underpinned by the Directive on Open Government that established responsibilities with regard to information release. In addition to releasing information, the portal serves as a centralised repository for the proactive disclosure of financial and human resources related information by the government.
3. **Government Results and Delivery.** Canadians have direct access to government mandate letters through a ‘Mandate Letter Tracker’, which provides a status report on the fulfilment of objectives in the mandate letters and helps to ensure that the government is held accountable.
4. **Citizen Engagement.** Canada has conducted more than 400 public consultations across a range of policy areas (i.e., poverty reduction, national pharmacare, labour market opportunities for persons with disabilities, climate change, and national defence). For example, the Open Government initiative has engaged over 11,000 individuals both online and in-person.

Impact: Through Open.Canada.Ca, the government recently made 80,000 datasets and records available to the public as well as 900,000 proactive disclosures. This information release involved 67 federal departments and agencies. The government has also increased information accessibility for users through its information portal, with approximately 140,000 users accessing approximately 60,000 datasets each month.

Furthermore, the release of government data has encouraged innovation. For instance, a CODE hackathon, which brought together individuals to compete using publicly released data, led to more than 100 applications being created over two days. Similarly, the Canadian Open Data Exchange has led to private firms using its open data to launch new products and services, create ventures, optimise business processes and create economic benefits. Thus far, more than 150 firms have been able to innovate and create new products and services with this open data.

Source: Adapted from Canada’s case study submission.

¹²⁹ Open Government Partnership, ‘Open Data Archives’, accessed 12 June 2019, <https://www.opengovpartnership.org/policy-area/open-data/>.

Even as governments continue to increase their use of digital technologies and tools, it is important that policymakers do not underestimate the risks of employing such technologies and tools and become over-reliant on them. For example, some economies have explored the use of AI to automate application processes. The question arises as to what happens if an AI makes an error or causes harm. It is important to put mechanisms in place so that aggrieved parties can seek redress. APEC economies are exploring ways to better govern technologies such as AI. For example, even as it plans to launch a pilot cross-border innovation platform for MSMEs that uses AI to match buyers and vendors globally,¹³⁰ Singapore has collaborated with the World Economic Forum's Centre for Fourth Industrial Revolution to launch Asia's first model AI governance framework. The framework will focus on four areas: (1) internal governance; (2) decision-making models; (3) operations management; and (4) customer relationship management. It aims to assist organisations to build consumer confidence and to make efforts to follow practices in data management and protection.¹³¹ The Government of Canada has established a Directive on Automated Decision-Making, to ensure the utilisation of AI in making or assisting in making administrative decisions is compatible with administrative law principles such as transparency, accountability, legality, and procedural fairness.¹³²

E. Non-mutually exclusive nature of activities

While the discussions above categorise issues and reform activities by core areas as developed and elaborated by EC, in reality, they usually straddle multiple core areas. For example, the reforms to facilitate the use of e-signatures across a broader range of activities are important both from the perspective of regulatory reform and EoDB. In addition, the use of digital tools for stakeholder consultations is important for regulatory reform and public sector governance. It is also worthwhile to note that in order to leverage new technologies and business models, policymakers need to look at various core structural reforms concurrently. For example, reaping the benefits of fintech requires competition policy reform to enable non-traditional players to offer financial services. At the same time, regulatory reform would be needed to allow them to offer such services on a trial basis via regulatory sandboxes.

¹³⁰ Jamie Lee, 'Singapore Budget 2019: SMEs Go Digital Programme To Be Expanded', *The Business Times*, 18 February 2019, <https://www.businesstimes.com.sg/government-economy/singapore-budget-2019/singapore-budget-2019-smes-go-digital-programme-to-be>.

¹³¹ Personal Data Protection Commission, Singapore, 'A Proposed Model Artificial Intelligence Governance Framework' (Singapore: Personal Data Protection Commission, 2019), <https://www.pdpc.gov.sg/-/media/Files/PDPC/PDF-Files/Resource-for-Organisation/AI/A-Proposed-Model-AI-Governance-Framework-January-2019.pdf>; Infocomm Media Development Authority, Singapore, 'Singapore Releases Asia's First Model AI Governance Framework', 6 May 2019, <http://www2.imda.gov.sg/news-and-events/Media-Room/Media-Releases/2019/singapore-releases-asias-first-model-ai-governance-framework>.

¹³² Government of Canada, 'Directive on Automated Decision-Making', modified 5 February 2019, <https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=32592>.

PART 3: STRUCTURAL REFORMS, THE DIGITAL ECONOMY AND INCLUSION

A. Introduction

Definition and motivation for efforts to promote inclusion

There is no agreed definition of ‘inclusion’ in the APEC context. This report will use three definitions of inclusion, based on agreed APEC instruments and analytic inputs that are deemed necessary to assess the impact of policies and regulations on inclusion with respect to the digital economy.

The **first** definition is **Equality of Opportunity**. The EC’s *Structural Reforms for Inclusive Growth: Three Approaches* document views inclusive growth as:

“growth that encompasses more equal access to economic opportunities for all, and which addresses the variety of barriers which can prevent people from accessing opportunities and contributing to economic growth.”

This definition aligns with the social and economic inclusion pillars of the APEC Action Agenda on Advancing Economic, Financial and Social Inclusion in the APEC Region (hereafter the *Action Agenda*), endorsed by APEC Leaders in 2017. The *Action Agenda* defines **social inclusion** (pillar 3) as:

“the process of improving the terms of participation in society for people who are at risk of poverty and social exclusion and enhancing equity.”

According to pillar 1 of the *Action Agenda*, **economic inclusion** refers to:

“equality in being informed of and having access to economic opportunity for all members of society to meaningfully participate in their economy.”

The first aspirational objective of the economic inclusion pillar is to:

“advance progress towards achieving full and productive employment and decent work for all, including young people, the elderly, and persons with disabilities, and equal pay for equal work”

The **second** definition of inclusion involves **Greater Income Equality**. It is important to track indicators of economic inequality such as the Gini coefficient¹³³ and the share of income captured by the top and bottom deciles in each economy, for several reasons. First, such indicators are one way to measure the impact of digital economy trends on the effectiveness of policy measures to promote inclusion. Second, increasing income inequality can undermine economic growth.¹³⁴ For instance, in a study of OECD economies across a period of 30 years, income inequality was found to have a negative and statistically significant impact on growth. The study also found that inequality has a dampening effect on skills development in terms of both education level and skills attained among individuals with

¹³³ The Gini index or coefficient Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

¹³⁴ United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP), *Inequality in Asia and the Pacific in the Era of the 2030 Agenda for Sustainable Development* (Bangkok: UN, 2018), <https://www.unescap.org/sites/default/files/publications/ThemeStudyOnInequality.pdf>.

poorer parental education backgrounds.¹³⁵ Similarly, the IMF found a robust relationship between lower net inequality and faster as well as more sustainable growth.¹³⁶ Third, some features of the digital economy exacerbate the current trend toward greater income inequality in APEC economies (see following subsection). Fourth, if the benefits of the digital economy or economic growth are largely captured by a small segment of the population, this could undermine public support for efforts to promote trade and the digital economy.

In the *Action Agenda*, the second aspirational objective of the economic inclusion pillar is to:

“progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the average level in each economy as envisioned in the 2030 Agenda on Sustainable Development.”

The **third** definition of inclusion used in this report is **Financial Inclusion**. According to the *Action Agenda*, a focus on financial inclusion involves efforts to ensure that:

“individuals and businesses have appropriate access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way.”

The *Action Agenda* calls on APEC economies to:

“Strengthen the capacity of financial institutions to encourage and expand access to banking, insurance and financial services, and increase financial literacy and capability of all to access finance.”

The application of digital technologies, tools and business models such as blockchain, crowdfunding/crowdsourcing and internet-only banks to the financial sector has the potential to make access to finance (or financial services provision) more inclusive to wider segments of the society. In this regard, the paper also considers how structural reform in the digital economy can be employed to achieve financial inclusion.

Call for inclusive growth: The empirical evidence

In recent years, a combination of factors has brought fresh impetus to APEC’s work to promote inclusive growth. The **first** is the widening disparity across different dimensions amidst the benefits of globalisation. APEC Structural Reform Ministers noted in their meeting in 2015 that ‘while absolute poverty has fallen and average income per capita has increased in the region, growth in some cases has widened income disparities between the rich and poor’. The Ministers further observed that ‘the benefits of rapid economic growth have been unevenly shared both across and within individual APEC economies, and that ‘there are groups, firms and regions that have benefited proportionately less from economic growth and globalization.’

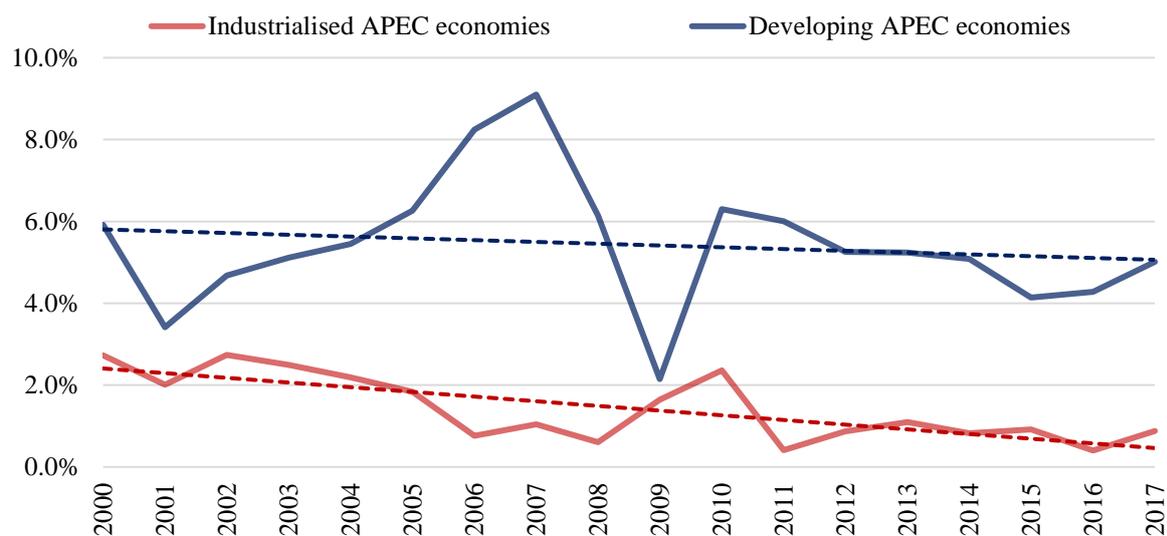
Second, and specifically in the context of the digital economy, is the observation that while advancements in new technologies and business models have led to more opportunities, there is a need to ensure that ordinary workers (labour) share in the benefits of the digital economy. There are at least two ways that welfare of labour can be measured over time. One is through growth in labour productivity. In a competitive market economy, growth in labour productivity is a pre-requisite for

¹³⁵ Federico Cingano, ‘Trends in Income Inequality and Its Impact on Economic Growth’ (Paris: OECD, 2014), <https://doi.org/10.1787/5jxrjncwxv6j-en>.

¹³⁶ Jonathan Ostry, Andrew Berg and Charalambos Tsangarides, *Redistribution, Inequality, and Growth* (Washington DC: IMF, 2014), <http://elibrary.imf.org/view/IMF006/21122-9781484352076/21122-9781484352076/21122-9781484352076.xml>.

growth in real wages, which translates to improved welfare for labour and households. Economists have noted that labour productivity growth has been on a downward trend over the past two decades. The International Monetary Fund (IMF) has found reductions in labour productivity growth across the G5 and emerging market economies.¹³⁷ The slowdown in labour productivity growth is observed in APEC economies as well. Between 2000 and 2017, both industrialised and developing APEC economies experienced declining labour productivity growth with the former declining at a faster rate (Figure 3.1).¹³⁸ While measurement issues could have contributed to the downward trend (see Section B of Part1), structural barriers may have played a role too.

Figure 3.1: Growth of labour productivity in APEC, 2000-2017



Source: APEC Policy Support Unit, 'APEC Regional Trends Analysis: The Digital Productivity Paradox' (Singapore: APEC, November 2018), <https://www.apec.org/Publications/2018/11/APEC-Regional-Trends-Analysis---The-Digital-Productivity-Paradox>.

Another way to measure welfare to labour over time is through share of labour compensation in GDP. Labour share is often considered an indicator of the distribution of income and the inclusiveness of economic growth because the majority of people in a society are workers and not capital owners. A falling share is indicative of increasing income inequality for two reasons. First, low-skilled and, to a certain extent, middle-skilled workers experience a decline in real earnings. Second, a lower labour share translates to a higher capital share and hence higher compensation to capital, since the majority of capital owners belong to the top income distribution bracket.¹³⁹ Although the labour share in many economies has been stable throughout the second half of the last century, several studies have noted the decline of labour share in recent years,¹⁴⁰ and a similar pattern is being observed in APEC economies as well. Labour shares that have been adjusted to include imputed wages for self-employed workers (which is gaining importance in the digital economy) show that both industrialized and developing

¹³⁷ IMF, 'Is Productivity Growth Shared in a Globalized Economy?' in *World Economic Outlook, April 2018: Cyclical Upswing, Structural Change* (Washington DC: IMF, 2018), <https://www.elibrary.imf.org/view/IMF081/24892-9781484338278/24892-9781484338278/ch04.xml>.

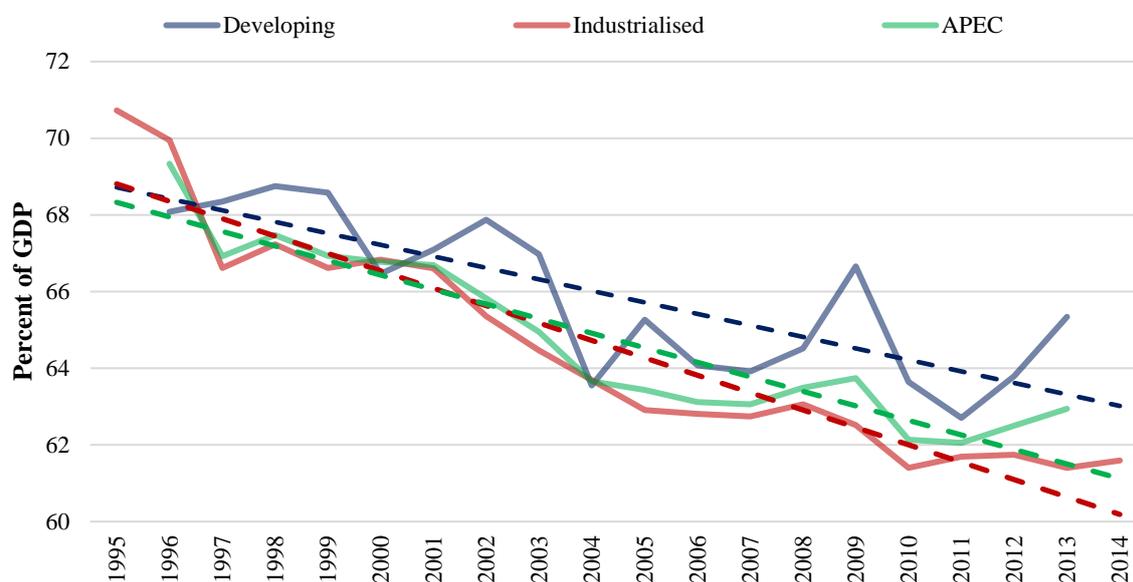
¹³⁸ APEC Policy Support Unit, 'APEC Regional Trends Analysis: The Digital Productivity Paradox' (Singapore: APEC, November 2018), <https://www.apec.org/Publications/2018/11/APEC-Regional-Trends-Analysis---The-Digital-Productivity-Paradox>.

¹³⁹ IMF, 'Understanding the Downward Trend in Labor Income Shares', in *World Economic Outlook, April 2017: Gaining Momentum* (Washington DC: IMF, 2017), <https://www.imf.org/en/Publications/WEO/Issues/2017/04/04/world-economic-outlook-april-2017>.

¹⁴⁰ ILO and OECD, 'The Labour Share in G20 Economies' (report for the G20 Employment Working Group, Antalya, Turkey, 2015), <https://www.oecd.org/g20/topics/employment-and-social-policy/The-Labour-Share-in-G20-Economies.pdf>.

APEC economies exhibited a downward trend in labour share between 1995 and 2014, indicating that income inequality is increasing in the region (Figure 3.2).¹⁴¹ Several factors associated with or aggravated by the digital economy can put downward pressure on wages. These are discussed later in the report.

Figure 3.2. Adjusted labour share in APEC



Source: APEC Policy Support Unit, 'APEC Regional Trends Analysis: Declining Labour Share and the Challenge of Inclusion' (Singapore: APEC, November 2017), <https://www.apec.org/Publications/2017/11/APEC-Regional-Trends-Analysis-2017>.

The impact of the digital economy on inclusion

The digital economy can have an impact on inclusion through different channels. One is through reduction in jobs and employment opportunities. As with past technological revolutions (e.g., mechanisation, steam engine, mass production, electrification), ensuring that the benefits of the digital economy are shared broadly will require supporting factors such as providing workers with the right skills and ensuring that all have access to infrastructure, technology, and adequate social protection. For example, in the financial sector, the ability to access services provided by online-only banks and therefore, enhance financial inclusion is dependent on having access to mobile phones, the internet and the skills to utilise them including financial literacy. Limitations in any one of these factors may affect the ability of individuals and firms to fully participate in the digital economy. This section will discuss each in more detail.

1. Reduction in jobs and employment opportunities

The relationship between digital technology and employment is unclear. Preliminary estimates conducted by the PSU show that there is no statistically significant correlation between digital technology use (measured as mobile cellular and fixed broadband subscriptions per 100 people) and employment.¹⁴² Although more research is required to determine the exact relationship between digital

¹⁴¹ APEC Policy Support Unit, 'APEC Regional Trends Analysis: Declining Labour Share and the Challenge of Inclusion' (Singapore: APEC, November 2017), <https://www.apec.org/Publications/2017/11/APEC-Regional-Trends-Analysis-2017>.

¹⁴² APEC Policy Support Unit, 'APEC Regional Trends Analysis: Rethinking Skills Development in the Digital Age' (Singapore: APEC, November 2016), <https://www.apec.org/Publications/2016/11/APEC-Regional-Trends-Analysis-Rethinking-Skills-Development-in-the-Digital-Age>.

technologies and employment, this could be pointing to the opposing impacts of digital technologies and tools on employment. For example, even as digital technologies are complementing labour and improving their productivity, as well as creating new jobs and hence opportunities for employment, they are also making some jobs obsolete through automation.

Repetitive and routine jobs are being replaced by computers and/or robots that can do the job more efficiently. McKinsey estimates that about 50 percent of time spent on existing work activities can technically be automated using currently demonstrated technologies, and that up to 375 million workers may need to move to a different occupational category by 2030. The same report further notes that although less than 5 percent of occupations can be fully automated, 60 percent of current occupations have at least one-third of their constituent activities technically automatable.¹⁴³ A study by Frey and Osborne observes that up to 47 percent of jobs in the United States are at risk of computerisation,¹⁴⁴ with jobs requiring a higher skill level less likely to be computerised than lower-skilled routine jobs. Nedelkoska and Quintini find approximately 14 percent of jobs in OECD economies participating in the Survey of Adult Skills to be highly automatable (i.e., having an automation probability of over 70 percent). This suggests that automation could affect more than 66 million workers in OECD economies.¹⁴⁵ As seen in Figure 3.2, the declining labour income shares is also observed in developing economies, with technological change being identified as one possible cause.¹⁴⁶

In the past, due to the high cost of adopting newer technologies, many firms preferred human labour. However, technological advancements have been such that besides making machines, robots and computers more effective at performing tasks, improved production methods and global value chains have also made them more affordable. As a result, the relative cost of accessing production capital has fallen to the point that it is often more efficient for firms to automate certain tasks, especially routine ones.¹⁴⁷ While it has been shown that developing economies are exposed to routinisation to a significantly lesser extent than developed economies, Das and Hilgenstock also note that automation may have sizeable impacts in some developing economies because of the rapid pace they have adopted technology, with potential for significant labour displacement.¹⁴⁸ The increasing efficiency and cost-effectiveness of new technologies could tilt production capital-labour ratios in favour of capital even in labour-abundant developing economies. A study by the IMF shows that for a 15 percent decrease in the relative price of investment goods, the labour share in an economy with high and low initial exposure to routinisation decreased by 1.5 and 0.4 percentage points, respectively.¹⁴⁹

A related impact of digital technology, and more specifically, automation is job polarisation whereby low-wage/low-skill and high-wage/high-skill work remains, while jobs in the middle range largely

¹⁴³ James Manyika et al., 'Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation' (McKinsey Global Institute, 6 December 2017), <https://www.mckinsey.com/~media/mckinsey/featured%20insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx>.

¹⁴⁴ Carl Benedikt Frey and Michael A. Osborne, 'The Future of Employment: How Susceptible Are Jobs to Computerisation' (Oxford: Oxford University, September 2013), https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf.

¹⁴⁵ The Survey of Adult Skills comes under the OECD Programme for the International Assessment of Adult Competencies. See Ljubica Nedelkoska and Glenda Quintini, 'Automation, Skills Use and Training' (Paris: OECD, 8 March 2018), https://www.oecd-ilibrary.org/employment/automation-skills-use-and-training_2e2f4eea-en.

¹⁴⁶ APEC Policy Support Unit, 'APEC Regional Trends Analysis: Declining Labour Share and the Challenge of Inclusion' (Singapore: APEC, November 2017), <https://www.apec.org/Publications/2017/11/APEC-Regional-Trends-Analysis-2017>.

¹⁴⁷ For examples, see OECD, 'Labour Losing to Capital: What Explains the Declining Labour Share?', in *OECD Employment Outlook 2012* (Paris: OECD, 2012), 109–61, https://doi.org/10.1787/empl_outlook-2012-4-en; Loukas Karabarbounis and Brent Neiman, 'The Global Decline of the Labor Share' (Cambridge, MA: National Bureau of Economic Research, June 2013), <https://doi.org/10.3386/w19136>.

¹⁴⁸ Mitali Das and Benjamin Hilgenstock, 'The Exposure to Routinization: Labor Market Implications for Developed and Developing Economies', IMF Working Paper WP/18/135 (Washington DC: IMF, 2018), <https://www.imf.org/~media/Files/Publications/WP/2018/wp18135.ashx>

¹⁴⁹ IMF, 'Understanding the Downward Trend in Labor Income Shares'.

decline. This is based on the observations that the most vulnerable workers are those in middle-skill jobs such as assembly, transcription and data entry. Such jobs involve routine tasks that can be replaced by robotisation or the use of algorithms, yet are valuable enough for firms to invest in their automation. Indeed, besides the OECD estimate indicated in the preceding paragraph, another 31 percent of jobs are estimated to be at risk of significant change as a result of automation, implying that half of all jobs will experience significant change.¹⁵⁰ Specifically in Chile, OECD estimated that about 30 percent of jobs are considered at risk of significant change, and some 20 percent jobs are estimated to be at a high risk of automation.¹⁵¹

Other empirical data have already begun showing a gradual phasing out and automation of middle-skill jobs. For instance, a European jobs monitor conducted in 2014 shows that when employment rates declined across the European Union between 2011 and 2013, the greatest share of decline was among low- to middle-paid workers in construction and manufacturing.¹⁵² In the United States, Autor and Dorn note a U-shaped employment patterns with a decline in the middle-skill workers even as employment gains were observed at the tails.¹⁵³ This calls for policymakers to explore policies to re-skill people who have lost their job so that they are able to find another one, thereby giving them a stake in the new economy instead of being excluded. This point is related to the discussion on skills development in the next section.

2. *Lack of skills for the new digital economy jobs among the population*

Even as technology displaces workers, it has also led to the creation of new jobs and opportunities. A Google search of ‘10 jobs that didn’t exist 10 years ago’ shows that while positions such as app developer, social media manager, cloud computing specialist, digital marketing specialist, and data scientist are more common now, they would have been unheard of a decade ago or so. In its Future of Jobs report, the World Economic Forum notes that most in-demand occupations did not even exist five to 10 years ago. It also predicts that 65 percent of children joining primary school today would be working in jobs yet to exist.¹⁵⁴

Technology also has the ability to complement existing jobs and improve worker productivity either directly or indirectly. Instead of making jobs obsolete, certain technologies can assume some aspects of a job and allow workers to focus on those aspects that cannot be automated. As a result, firms are able to undertake more activities, increase profits and even hire more people. For example, property agents are increasingly using digital tools to obtain information such as capital appreciation, net rental yield and last transacted price for a specific property. Some are even employing drones to better show the property and surrounding facilities to potential buyers or tenants.

However, being able to perform at the new jobs and leverage these technologies requires individuals with the requisite knowledge and skills. It can take a considerable amount of time to provide workers with skills for the industries of tomorrow. An assembly line worker today cannot become an app developer tomorrow. Likewise, a transcriber today cannot become a drone operator tomorrow. Even for skills upgrades that require significantly less time, such as learning a new software package, mastery cannot be achieved overnight.

¹⁵⁰ Nedelkoska and Quintini, ‘Automation, Skills Use and Training’.

¹⁵¹ OECD, ‘Making the Digital Transformation Work in LAC’ (OECD Science, Technology and Innovation Directorate, forthcoming 2019).

¹⁵² World Economic Forum, ‘The Future of Jobs Report 2016’.

¹⁵³ Enrique Fernández-Macías and John Hurley, *Drivers of Recent Job Polarisation and Upgrading in Europe: European Jobs Monitor 2014* (Luxembourg: Publications Office of the European Union, 2014), <https://www.eurofound.europa.eu/publications/report/2014/labour-market/drivers-of-recent-job-polarisation-and-upgrading-in-europe-european-jobs-monitor-2014>.

¹⁵⁴ David H. Autor and David Dorn, ‘The Growth of Low-Skill Service Jobs and the Polarization of the US Labor Market’, *American Economic Review* 103, no. 5 (August 2013): 1553–97, <https://doi.org/10.1257/aer.103.5.1553>.

¹⁵⁴ World Economic Forum, ‘The Future of Jobs Report 2016’.

Although some economies are emphasising the importance of continuously upgrading their labour force, the rapid evolution of technologies associated with the digital economy has added to the challenge. The most efficient way of doing things today may no longer be appropriate a few months or years down the road. Essentially, rapid changes have led to a shortening of the period between upgrading. Naturally, it has also led to a diminishing ability of governments and firms to identify and predict future skills demand and hence coordinate training needs. While industrial and education policies can coordinate the labour market for skill sets that remain largely unchanged for prolonged period of time, they cannot do so when in-demand skills change within a shorter period of time than it takes to train people.

Consequently, observations of mismatch between what workers know and what industries need have become more prevalent. For example, a 2013 survey conducted by the OECD found that about 21 percent and 13 percent of workers in OECD economies are employed in jobs for which they are either under- or over-qualified respectively.¹⁵⁵ Further, 17 percent of workers reported skill mismatches at their current jobs. More recently, another OECD study found that three out of four firms in Latin American economies reported having difficulties in filling vacancies.¹⁵⁶ By preventing labour from being used optimally, skills mismatch reduces productivity, as shown by McGowan and Andrews.¹⁵⁷

3. *Lack of access to infrastructure*

Infrastructure development is critical to ensure that more segments of the population are able to access economic opportunities. In the context of the digital economy, energy infrastructure is required to power hardware devices such as computers, broadband modems and mobile phones. Telecommunications serve as the backbone infrastructure necessary to access the internet, which in turn allow individuals to access and leverage related services. For example, only individuals with access to the internet can make and receive digital payments, provide digital services or use e-commerce as a sales channel.

Governments around the world are launching e-government portals to deliver public services such as licence applications and tax filing. In rural and remote places where the population size may not justify the establishment of administrative offices, schools and health clinics, digital means of public service provision can arguably complement the traditional delivery of education and healthcare services.¹⁵⁸ In general, government efforts to employ digital technologies and tools to improve public services provision depend on the targeted population having access to the internet. The importance of universal and affordable access to the internet is highlighted by its inclusion in the UN Sustainable Development Goals.¹⁵⁹

The digital economy also requires access to non-digital infrastructure in order to function optimally. While an increasing number of goods and services are digitally ordered, a significant share are not digitally delivered. Basic infrastructure such as roads, ports and airports remain critical for the production of goods and services, trade and mobility.

Academic literature has frequently emphasised the strong linkages between infrastructure and inclusion. For example, Calderon and Servén find that a one standard deviation improvement in the index of

¹⁵⁵ OECD, *OECD Skills Outlook 2013* (Paris: OECD, 2013), https://www.oecd-ilibrary.org/education/oecd-skills-outlook-2013_9789264204256-en.

¹⁵⁶ OECD, 'Hacia Una América Latina 4.0' [Towards a 4.0 Latin America], Making Development Happen Series no. 5 (OECD Development Centre, forthcoming).

¹⁵⁷ Müge Adalet McGowan and Dan Andrews, 'Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data' (Paris: OECD, 28 April 2015), <https://doi.org/10.1787/5js1pzx1r2kb-en>.

¹⁵⁸ For examples, see Emmanuel A. San Andres, Satvinderjit Kaur Singh and Jenny Ayumi Kai, 'Development and Integration of Remote Areas in the APEC Region' (Singapore: APEC, November 2018), <https://www.apec.org/Publications/2018/11/Development-and-Integration-of-Remote-Areas-in-the-APEC-Region>.

¹⁵⁹ UN, 'Goal 9: Build Resilient Infrastructure, Promote Sustainable Industrialization and Foster Innovation', Sustainable Development Goals, 2015, accessed 16 September 2019, <https://www.un.org/sustainabledevelopment/infrastructure-industrialization/>.

infrastructure stocks and quality would raise growth by 2.9 and 0.68 percentage points, respectively.¹⁶⁰ Fan et al. find that 3.2 individuals were lifted out of poverty in China for every RMB 10,000 invested in rural road infrastructure.¹⁶¹ According to Chandara and Thompson, for US counties with new interstate highways running through them, earnings rose by approximately up to 8 percent and services and retail industries grew by up to 8 percent over 25 years after the initial opening. On the other hand, counties adjacent to new interstate highways saw total earnings fall by up to 3 percent and retail earnings fall by up to 11 percent.¹⁶²

Despite the importance of infrastructure, however, economies have often underinvested with potentially consequent negative implications for efforts to promote inclusion. In 2018, the International Telecommunication Union (ITU) found that while most of the world's population had mobile cellular coverage, only 51.2 percent or 3.9 billion people were using the internet, possibly pointing to affordability being an issue.¹⁶³ In many economies, disparity in access to crucial infrastructure is a major factor that explains why people in rural areas have been unable to deepen their participation in the economy vis-à-vis their urban counterparts. Specifically in APEC, economies face significant gaps for broad categories of infrastructure including ICT, with one study indicating that APEC economies will collectively need to spend USD2 trillion per year from 2020 to 2025. This is expected to rise to almost USD 2.5 trillion per year on infrastructure in the 2030–2035 period. The region's overall infrastructure needs are expected to rise by almost 92 per cent between 2010 and 2035.¹⁶⁴ With the continuous development and rollout of new technologies such as 5G, new infrastructure would need to be built, hence possibly further widening the gap.

4. Lack of technological diffusion

Each phase of technological change and advancement including the current digital revolution has changed the way people work, live and interact. GPS-enabled phones and devices installed in vehicles are now used to find directions instead of printed paper maps. Emails and messaging apps are used to send communications instead of snail mail. Instead of going through volumes of books and other resource materials in libraries, the first go-to option for information nowadays is a search engine such as Google or Duck Duck Go. In fact, a smartphone today has more computational power than all the computers used to send humans to the Moon, and the transistor count per integrated circuit has increased exponentially from about 2,000 in 1972 to more than 19 billion in 2017.¹⁶⁵ Furthermore, internet speeds are now a multiple of what they were in the 1990s.

This growth in computational capability has led to innovations that have transformed how firms and people work. Many tasks such as accounting, inventory management and transcription have become easier and faster to complete. Specifically, data serve as critical inputs in value chains. In the transport and logistics sector, data are used for monitoring and assessing the safety, capacity and efficiency of asset deployment as well as to tailor loyalty schemes to attract and retain customers. In the manufacturing sector, data are used across the various stages of the value chain to reduce machine

¹⁶⁰ César Calderón and Luis Servén, 'The Effects of Infrastructure Development on Growth and Income Distribution' (Washington, DC: World Bank, 2004), <https://doi.org/10.1596/1813-9450-3400>.

¹⁶¹ Shenggen Fan, Linxiu Zhang and Xiaobo Zhang, 'Growth and Poverty in Rural China: The Role of Public Investments' (Washington, DC: International Food Policy Research Institute, 2000), <https://ideas.repec.org/p/fpr/eptddp/66.html>.

¹⁶² Amitabh Chandra and Eric Thompson, 'Does Public Infrastructure Affect Economic Activity? Evidence from the Rural Interstate Highway System', *Regional Science and Urban Economics* 30, no. 4 (2000): 457–90.

¹⁶³ ITU, 'ITU Releases 2018 Global and Regional ICT Estimates', 7 December 2018, <https://www.itu.int/en/mediacentre/Pages/2018-PR40.aspx>.

¹⁶⁴ APEC, *APEC Economic Policy Report 2018*.

¹⁶⁵ Karl Rupp, '40 Years of Microprocessor Trend Data', 25 June 2015, <https://www.karlrupp.net/2015/06/40-years-of-microprocessor-trend-data/>.

downtime and track inventory, among others. Data analytics are also used to detect anomalies, combat fraud and provide enterprise solutions.¹⁶⁶

For new technologies and tools to contribute to productivity growth, they must be employed in the production of goods and services, but several factors can hinder their utilization. **First**, the growing complexity of the technologies and the knowledge required to apply them may prevent their efficient transfer to and by more firms. For example, the OECD has indicated that while most firms have access to high-speed broadband networks, fewer have access to more advanced, productivity-enhancing tools such as enterprise resource planning systems or big data analytics. In OECD economies, only 28 percent of large firms have performed big data analysis. The share was even lower for small (9 percent) and medium-sized firms (16 percent).¹⁶⁷

Second, the diffusion of the technologies could be impeded by the lack of a supportive business environment and appropriate regulations in areas such as data and technology sharing. As an illustration, the OECD has found that diffusion of some digital technologies is generally more advanced in sectors where firm turnover (i.e. entry and exit) is higher.¹⁶⁸ Consequently, frontier firms are able to enjoy significant gains from their new technologies, while non-frontier firms face a range of structural and legal barriers preventing them from harnessing these technologies, with negative implications for their productivity. For example, Bahar and Rapoport find that the fastest productivity growth in Europe is concentrated among the most and least productive firms, while the rest of the firms are trapped in a middle productivity trap.¹⁶⁹

Box 3.1. Uneven adoption and diffusion of digital technologies help explain the digital ‘productivity paradox’

One of the great promises of the digital transformation is accelerated productivity growth through new avenues for innovation and reduced costs of business processes. But despite the diffusion of digital technologies since the mid-1990s, aggregate productivity growth has slowed over the past decade or so, sparking a lively debate about the potential for digital technologies to raise productivity. While some have suggested that this digital ‘productivity paradox’ may partly be explained by inadequate measurement, OECD work suggests that this does not explain the slowdown.

Moreover, the adoption and diffusion of digital tools is not uniform across firms, industries, sectors and economies. Importantly, the aggregate productivity slowdown masks a widening gap in multi-factor productivity (MFP) growth among firms, with firms in ICT-intensive services sectors leading at the frontier (Figure 3.3). Throughout the economy, this divergence is driven not only by some leading firms pushing out the productivity frontier, but also by the stagnating productivity of a long tail of laggard firms that seemingly lack the capabilities or incentives to adopt new technology and best practices.

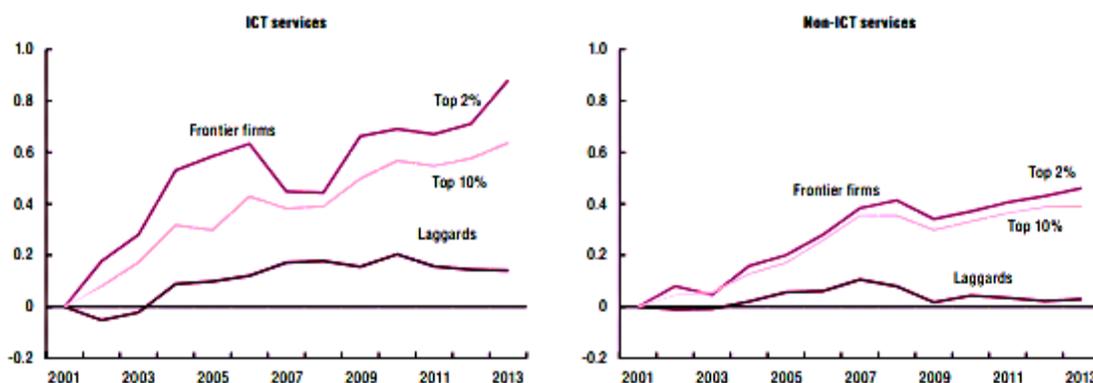
¹⁶⁶ Vishal Beri et al., ‘Fostering an Enabling Policy and Regulatory Environment in APEC for Data-Utilizing Businesses’ (Singapore: APEC, July 2019), <https://www.apec.org/Publications/2019/07/Fostering-an-Enabling-Policy-and-Regulatory-Environment-in-APEC-for-Data-Utilizing-Businesses>.

¹⁶⁷ OECD, ‘Productivity Growth in the Digital Age’ (Paris: OECD, February 2019), <https://www.oecd.org/going-digital/productivity-growth-in-the-digital-age.pdf>.

¹⁶⁸ Flavio Calvino and Chiara Criscuolo, ‘Business Dynamics and Digitalisation’ (Paris: OECD, 2019), https://www.oecd-ilibrary.org/science-and-technology/business-dynamics-and-digitalisation_6e0b011a-en.

¹⁶⁹ Dany Bahar and Hillel Rapoport, ‘Migration, Knowledge Diffusion and the Comparative Advantage of Nations’, *The Economic Journal* 128, no. 612 (2018): F273–305, <https://doi.org/10.1111/eoj.12450>.

Figure 3.3. Widening gap in multi-factor productivity growth



These signs suggest that the main source of the productivity slowdown may not be so much a slowing of innovation by the most globally advanced firms, but an uneven uptake and diffusion of these innovations throughout the economy. This could also reflect the being the cusp of a new technological wave where only a few front-runners have mastered the new opportunities created by digital technologies, and the know-how needed to exploit these opportunities has not yet been codified for easy dissemination. Adoption and diffusion of digital technologies remain well below potential, but can be facilitated by public policy.

Adapted in full or part from:

- Avi Goldfarb and Catherine Tucker, 'Digital Economics' (National Bureau of Economic Research, August 2017), <https://doi.org/10.3386/w23684>.
- Nadim Ahmad, Jennifer Ribarsky and Marshall Reinsdorf, 'Can Potential Mismeasurement of the Digital Economy Explain the Post-Crisis Slowdown in GDP and Productivity Growth?' (Paris: OECD, 2017), https://www.oecd-ilibrary.org/economics/can-potential-mismeasurement-of-the-digital-economy-explain-the-post-crisis-slowdown-in-gdp-and-productivity-growth_a8e751b7-en.
- Flavio Calvino and Chiara Criscuolo, 'Business Dynamics and Digitalisation' (Paris: OECD, 2019), https://www.oecd-ilibrary.org/science-and-technology/business-dynamics-and-digitalisation_6e0b011a-en.
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- Dan Andrews, Chiara Criscuolo and Peter Gal, 'The Best vs the Rest: The Global Productivity Slowdown Hides an Increasing Performance Gap across Firms', blog, VoxEU.Org, 27 March 2017, <https://voxeu.org/article/productivity-slowdown-s-dirty-secret-growing-performance-gap>.
- OECD, *The Future of Productivity* (Paris: OECD, 2015), <https://doi.org/10.1787/9789264248533-en>.

5. Lack of access to social protection

Capital and labour are two inputs commonly used by economists in a production function. One fundamental difference between the two inputs is that while capital can be liquidated or moved from one sector to another, more time and resources are needed to redeploy and/or retrain workers. This is particularly so if the sectors are very different in terms of skills requirements, in which case the unemployed workers would need assistance to enrol in the training programmes that would equip them with the relevant skills. Assistance programmes should be updated to include support for individuals and households during lengthy periods of retraining and adjustment.

While APEC economies have various kinds of social protection systems, many are primarily focused on temporary setbacks such as injury or short-term unemployment, and are not an appropriate form of

support for a period of extensive retraining. In the absence of an up-to-date social protection system, unemployed workers may become risk averse and decide to save their limited resources for a medical emergency rather than investing in skills training. It has been found that better social protection allows for increased accumulation of assets and improves labour market participation.¹⁷⁰ The lack of social protection will have significant impact on workers accumulating the right skills and they may find it even more challenging to find a new job. On the intergenerational front, unemployed or underemployed workers who typically have no or lower income may be more reluctant to invest in their children's education, thus passing the inclusion issue on to the next generation.¹⁷¹

Even for economies with more robust social protection systems, the new digital economy business models have exacerbated trends that, if not addressed, are likely to have negative implications for inclusion. In many economies only those with gainful employment can participate in social protection systems. The digital economy, however, has led to the rise of newer forms of employment such as private-hire drivers, freelancers and other self-employed workers that are regarded as independent contract workers rather than employees.¹⁷² While there are advantages to such forms of employment, one critical disadvantage is that workers are usually not entitled to social security contributions and may also have fewer opportunities to access training, union representation and health benefits that permanent/full time employees enjoy.¹⁷³ In fact, it has been suggested that the digital economy may be creating a precarious class of on-demand workers or independent contractors.

Enhancing inclusion in the digital economy: the EC's three approaches

The digital economy has wide-ranging implications for society as a whole. Specifically from the lens of inclusion, the above discussions have shown that although EC's core structural reforms are essential, they constitute only one aspect of structural-reform related work and should be complemented with other policies. In recognition of this, the Committee produced the *Three Approaches* in 2018. The document outlines three approaches that economies may take to better harness structural reform to tackle complex challenges such as inclusive growth (see Box 3.2.). The first approach (Approach I), known as 'Getting the Basics Right' involves ensuring that core structural reforms are correctly applied. Part 2 of the main report was about getting the basics right with regards to four core structural reforms as applied to digital economy challenges. This is followed by two more complex and holistic strategies. The second approach (Approach II) involves making core structural reforms pro inclusive and/or undertaking structural reforms in specific areas to generate positive externalities for inclusion such as education and skills, infrastructure and social security. The third approach (Approach III) involves ensuring that core structural reforms are aligned with other types of reforms and supporting policies to maximise the impact with respect to policy objectives such as inclusive growth. As will be seen in the next section, these approaches can equally be applied to the intersection between the digital economy and inclusion.

¹⁷⁰ Department of Foreign Affairs and Trade, Australia, 'Social Protection and Growth – Briefing', accessed 23 August 2019, <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9100.pdf>.

¹⁷¹ Shelley A. Phipps and Lynn Lethbridge, *Income and the Outcomes of Children* (Ottawa: Statistics Canada, 2006).

¹⁷² OECD, *The Future of Social Protection: What Works for Non-Standard Workers?* (Paris: OECD, 2018), <https://doi.org/10.1787/9789264306943-en>; Joseph V. Kennedy, 'Three Paths to Update Labor Law for the Gig Economy' (Information Technology and Innovation Foundation, April 2016), <http://www2.itif.org/2016-labor-law-gig-economy.pdf>.

¹⁷³ OECD, *The Future of Social Protection*; James Manyika et al., 'Independent Work: Choice, Necessity, and the Gig Economy' (McKinsey Global Institute, October 2016), <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Employment%20and%20Growth/Independent%20work%20Choice%20necessity%20and%20the%20gig%20economy/Independent-Work-Choice-necessity-and-the-gig-economy-Executive-Summary.ashx>.

Box 3.2. Three Approaches – Key definitions

Core Structural Reforms – the six core structural reform functions of the Economic Committee’s work programme: Competition Policy and Law; Regulatory Reform; Ease of Doing Business (EoDB); Public Sector Governance (PSG); Strengthening Economic and Legal Infrastructure (SELI); and; Corporate Law and Governance (CLG). This report applies the first four of these six core structural reforms to meet digital economy challenges, but the other two (SELI and CLG) are relevant as well (see Part 2).

Supplementary Structural Reforms – can range from macroeconomic policy to a variety of changes to laws, regulations and institutions that directly or indirectly improve the functioning of markets, but that do not fall under the EC’s six Core Structural Reforms.

Supporting Policies – policies required to advance government objectives but that generally do not involve changes in laws or institutions. They often (but not always) involve government expenditures (e.g., programmes, grants, incentives). When deployed along with Core and Supplementary Structural Reforms, they can be part of an integrated package designed to promote inclusive growth or attain other broad policy goals.

Source: APEC, ‘Structural Reforms for Inclusive Growth: Three Approaches’ (Singapore: APEC, 2015), <https://www.apec.org/-/media/Files/Groups/EC/Structural-Reforms-for-Inclusive-Growth---Three-Approaches.docx?la=en&hash=BD201A724890FAADE32D3A9A0E5999A8A6F51C10>.

B. Harnessing structural reforms to support inclusion

In line with Approach II (see Box 3.2), this section will examine the application of structural reforms to four broad government policy areas with strong externalities for inclusion: human capital development (HCD), social protection, infrastructure and fiscal policy. Policymakers often employ a mix of structural reforms and supporting policies to achieve a specific policy objective, per Approach III. While the EC’s *Three Approaches* has made a clear distinction between structural reforms and supporting policies (see Box 3.2.), it is often challenging to do so in practice. Furthermore, Approach II and Approach III are not mutually exclusive. Through side-by-side consideration of the application of structural reforms and supporting policies to areas such as human capital development and infrastructure, the following section will provide greater understanding of the relationship between structural reforms and supporting policies, and between Approach II and Approach III, in the efforts to promote inclusive growth. Applications of Approach III will be discussed in more detail in Section 3C.

Human capital development

While the digital economy has brought many opportunities, the distribution of benefits has been uneven. As indicated previously, digitisation has created new job categories but has also led to job losses as some tasks can now be more easily automated. Workers are less likely to feel excluded if they have access to the necessary skills and reasonable prospects of obtaining employment in the digital economy.

The human capital development challenges posed by the digital economy calls for holistic policy frameworks that align structural reforms with supporting policies in areas such as training and other programs for unemployed workers. **Active labour market policies (ALMPs)** can play an important role here. The set of policies could include job search assistance, hiring subsidies, and information on relevant training programmes to help the unemployed find jobs more quickly and ensure that their skills

continue to be relevant during the search.¹⁷⁴ For instance, Canada has updated its Youth Employment and Skills Strategy (YESS), which focuses on youth facing barriers to employment, to include digital skills and work experience. It supports recent post-secondary graduates who are generally job-ready but may require a first employment experience through wage-subsidy opportunities that connect them with small businesses and not-for-profit organisations where they can gain meaningful work experience.¹⁷⁵ Governments in Latin America have developed skills-enhancing programmes for youth that combine classroom teaching, workplace learning and job search services to help young Latin Americans transition to employment. Training interventions for youth in the region, such as *Plan Nacional de Lenguas Digitales* in Chile, *Puntos Mexico Contactado* in Mexico and *ProJoven* in Peru, prove that comprehensive interventions have positive results on youth employability, earnings and especially job quality¹⁷⁶.

Even for the employed, there is a need to ensure they remain relevant as technology evolves. For example, although the use of ICT at work is generalised, the OECD found that over 60 percent of the EU labour force reported their computer skills as insufficient to apply for a new job.¹⁷⁷ Economies have responded to this need with digital training programmes for a range of individuals. Australia, for example, launched the Be Connected programme to improve the digital skills of older individuals.¹⁷⁸ Similarly, the Philippines has launched the Tech4Ed programme which establishes centres across the economy to provide access to information, online government services, skills training and business portals among others.¹⁷⁹

As shown in Figure 3.4., the World Bank indicates that three types of skills are becoming increasingly important in labour markets, namely, advanced cognitive skills (e.g., complex problem-solving), sociobehavioural skills (e.g. teamwork, empathy, conflict resolution, and relationship management), and skill combinations that are predictive of adaptability (e.g., reasoning and self-motivation). The OECD concurs, noting that while economies should endeavour to equip individuals with a range of generic and advanced ICT skills, such skills are not in and of themselves sufficient to thrive in the digital economy.¹⁸⁰ While it is essential that individuals have good literacy and numeracy skills, in the digital workplace, it is also important to develop complementary skills including socioemotional skills¹⁸¹ that enable workers to collaborate effectively. Some economies have provided **avenues for lifelong learning** where individuals are able to enrol and acquire new skills. For instance, Indonesia has launched a free industrial skill training programme that aims to train approximately 162,000 participants between 2017 and 2019.¹⁸² To ensure that seniors are equipped with the relevant skills,

¹⁷⁴ OECD, 'Preventing Unemployment and Underemployment from Becoming Structural' (*G20 Labour and Employment Ministerial Meeting*, Melbourne, Australia, 2014), <https://www.oecd.org/els/emp/OECD-Preventing-unemployment-and-underemployment-from-becoming-structural-G20.pdf>.

¹⁷⁵ From Canada's IER submission.

¹⁷⁶ OECD, 'Making the Digital Transformation Work in LAC'.

¹⁷⁷ OECD, *Measuring the Digital Economy: A New Perspective* (Paris: OECD, 2014), <https://doi.org/10.1787/9789264221796-en>.

¹⁷⁸ Department of Social Services, Australia, 'Be Connected – Improving Digital Literacy for Older Australians', 18 January 2018, <https://www.dss.gov.au/seniors/be-connected-improving-digital-literacy-for-older-australians>.

¹⁷⁹ Department of Information and Communications Technology, Philippines, 'e-Filipino Tech4Ed', DICT, accessed 11 September 2019, <https://dict.gov.ph/major-programs-and-projects/e-filipino/e-filipino-technology-for-the-economic-development-tech4ed/>.

¹⁸⁰ OECD, 'Skills for a Digital World' (Paris: OECD, December 2016), <https://www.oecd.org/els/emp/Skills-for-a-Digital-World.pdf>.

¹⁸¹ Socioemotional skills (also referred to as soft or noncognitive skills) encompass a broad range of malleable skills, behaviours, attitudes and personality traits that enable individuals to navigate interpersonal and social situations effectively. These include grit or the perseverance to finish a job or achieve a long-term goal, teamwork, punctuality, organisation, commitment, creativity and honesty. See World Bank, *World Development Report 2016: Digital Dividends* (Washington, DC: World Bank, 2016).

¹⁸² Stefani Ribka, 'Govt Launches Free Industrial Skills Training Program Nationwide', *The Jakarta Post*, 1 March 2017, <https://www.thejakartapost.com/news/2017/03/01/govt-launches-free-industrial-skills-training-program-nationwide.html>.

Singapore's IMDA Silver Infocomm Initiative provides digital clinics and experiential learning journeys for the elderly to allow them to engage with technology.¹⁸³

Figure 3.4. Skills needed in the modern economy

Cognitive	Social and Behavioural	Technical
<ul style="list-style-type: none"> • Literacy, numeracy and cognitive skills • Problem-solving skills • Verbal ability, memory and mental speed 	<ul style="list-style-type: none"> • Socioemotional skills and personality • Openness to experience, conscientiousness, extraversion and emotional stability • Self-regulation, mindset and interpersonal skills 	<ul style="list-style-type: none"> • Knowledge of methods and tools • General technical skills from schooling and training • Occupation-specific skills

Source: World Bank, *World Development Report 2016: Digital Dividends* (Washington, DC: World Bank, 2016).

While the above has focused on equipping both the unemployed and employed with the necessary skills to thrive in the digital economy, economies need to ensure that new entrants to the workforce are prepared for the new jobs and skill requirements. They need to ensure that **education systems evolve in line with the requirements of the digital economy**. Special attention should be paid to early childhood development since some of these skills are best acquired in one's early years. For instance, programming education will be mandatory in all elementary schools in Japan from April 2020.¹⁸⁴ Singapore has also responded by introducing coding classes for all upper primary pupils as an enrichment programme before being rolled to all primary schools by 2020.¹⁸⁵ Similarly, Canada has introduced the CanCode program to help young people learn to code, develop analytical thinking and foster problem-solving techniques that are important in in-demand STEM fields.¹⁸⁶

Other reform efforts should include **complementing classroom-based education with alternatives such as online courses**. The rate at which skills needs are changing has raised the question as to whether the current tertiary education¹⁸⁷ system could be complemented by shorter-term courses focusing on specific skill needs akin to what have been offered by some massive open online course (MOOC). According to Global Shapers, a community of young people under the World Economic Forum, found that in a survey of 25,000 young people, 77.84 percent reported having taken online courses in the prior year.¹⁸⁸ Despite the increasing trend toward online courses, academic leaders have been split in their opinion of such course, with only 27.8 percent agreeing it is a sustainable method for offering courses.¹⁸⁹

¹⁸³ Kevin Kwang, 'Singapore Libraries Have a New Remit: Equip Seniors with Digital Skills', *Channel NewsAsia*, 6 March 2018, <https://www.channelnewsasia.com/news/singapore/singapore-libraries-have-a-new-remit-equip-seniors-with-digital-10016716>.

¹⁸⁴ Atsuko Sano, 'Coding Will Be Mandatory in Japan's Primary Schools from 2020', *Nikkei Asian Review*, 27 March 2019, <https://asia.nikkei.com/Economy/Coding-will-be-mandatory-in-Japan-s-primary-schools-from-2020>.

¹⁸⁵ Hariz Baharudin, 'Enrichment Classes on Coding for All Upper Primary Pupils next Year', *The Straits Times*, 10 July 2019, <https://www.straitstimes.com/tech/coding-to-be-made-compulsory-for-all-upper-primary-pupils-next-year>.

¹⁸⁶ From Canada's IER submission.

¹⁸⁷ As defined by World Bank, 'tertiary education' refers to all post-secondary education, including both public and private universities, colleges, technical training institutes, and vocational schools. 'Tertiary Education', The World Bank, accessed 11 September 2019, <https://www.worldbank.org/en/topic/tertiaryeducation>.

¹⁸⁸ Jiyuan Yu and Zi Hu, 'Is Online Learning the Future of Education?', World Economic Forum, 2 September 2016, <https://www.weforum.org/agenda/2016/09/is-online-learning-the-future-of-education/>.

¹⁸⁹ I. Elaine Allen and Jeff Seaman, 'Changing Course: Ten Years of Tracking Online Education in the United States', (Babson Survey Research Group and Quahog Research Group, 2013), <http://www.onlinelearningsurvey.com/reports/changingcourse.pdf>.

Box 3.3. Digital learning tools for adult and life-long learning

Digital learning and open education come in many forms (e.g., post-secondary, undergraduate and graduate education, continuing education, short-term training and professional development). It can be offered by formal educational institutions, industry, or new entrants in the education and training fields. Digital learning can lower the cost of training, increase flexibility in training provision, and better meet individual needs, among others. Digital learning and open education holds much promise to foster adult and life-long learning.

One form of digital learning is online learning, which notably enables distance learning and can be open to a large number of students. Online learning includes tutorials, recorded lectures, online educational resources, as well as small, private online courses or massive open online courses (MOOCs). MOOCs have attracted much attention in recent years, but the returns from efforts to promote them in terms of widespread improvements to education and training have so far been limited.

While the first popular MOOCs were offered by formal post-secondary educational institutions and focused on traditional academic subject areas, more recently the number of MOOCs that aim at enhancing skills and providing professional development have increased. Some of these skills-oriented MOOCs have been created by, or in co-operation with, multinationals that help set the curricula or are prepared to accept certificates of successful MOOC completion in their hiring processes. For firms, MOOCs may provide a potentially cost-effective means of investing in their employees. Users of open education are largely employees that combine it with formal education and, to a lesser extent, workers on the job.

One key challenge facing many MOOCs is that completion rates are very low, and that patterns of participation and completion seem to replicate offline learning patterns, i.e., the highly educated and highly skilled are more likely to participate in and finish courses than low-skilled ones. For this reason, it is not yet clear if MOOCs will reduce or reinforce inequalities among workers. For those who complete online courses, certification and/or their recognition remains a challenge, despite many innovative approaches to certification that have evolved with digital learning, e.g. digital badges, nano and micro degrees, and other forms of credentials.

Adapted in full or part from:

- OECD, *Going Digital: Shaping Policies, Improving Lives* (Paris: OECD, 2019), 90, <https://doi.org/10.1787/978OECD.9264312012-en>.
- Almedina Music and Stéphan Vincent-Lancrin, 'Massive Open Online Courses (MOOCs): Trends and Future Perspectives' (Paris: OECD, 8 November 2016), [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD/RD\(2016\)5&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD/RD(2016)5&docLanguage=En).
- OECD, *OECD Skills Outlook 2019: Thriving in a Digital World* (Paris: OECD, 2019), <https://doi.org/10.1787/df80bc12-en>.

In addition, some technical skills can be acquired **through work-shadowing and apprenticeship programmes**. This underscores the importance of recognising skills outside formal channels through vehicles such as certifications and referral letters to complement the current education system. Malaysia's skills development initiative, TalentCorp, has created internships and apprenticeship programmes whose objective is to increase the supply of skilled labour for Malaysia's National Key Economic Areas.¹⁹⁰

¹⁹⁰ Kim Song Tan and James Tang, 'Managing Skills Challenges in ASEAN-5' (Singapore Management University and J.P. Morgan, October 2016), https://socsc.smu.edu.sg/sites/socsc.smu.edu.sg/files/%5Bcurrent-domain%3Amachine_name%5D/news_room/Managing%20Skills%20Challenges%20in%20ASEAN-5_Final%20Report.pdf.

Social protection

The new business models made possible by digital technologies pose challenges to traditional social protection frameworks and may require them to be updated accordingly. The fact that many jobs are vulnerable to the digital transformation process (e.g., driverless cars replacing drivers, online courses replacing after-school tutors, AI replacing interpreters, automation replacing pipeline workers) makes it all the more urgent for policymakers to ensure social protection frameworks are adapted to the new economy.

Traditional social programmes that provide subsidies, loans and retraining may still remain useful in the digital economy. For instance, the Employment Benefits and Support Measures (EBSM) programme in Canada, started in 1996, aims to get unemployed people back into the labour market quickly through measures delivered in partnership with the provincial and territorial governments, such as skills development initiatives, wage subsidies, and employment assistance services. The European Globalisation Adjustment Fund (EGF), set up by the European Union (EU) in 2007, supported 27,610 people between 2013 and 2014 and achieved a 50 percent re-employment rate through assistance efforts that include training, relocation and subsistence allowances. Similarly, Mexico's labour retraining programme (PROBECAT) provides retraining and placement services.¹⁹¹

Where social programmes designed for the analogue age are inadequate to face the challenges of the digital economy, economies could consider two approaches: (1) expanding and upgrading the current social protection programmes in terms of coverage and depth; or (2) introducing new programmes and policies that includes mandatory provision of certain forms of insurance and social benefits by companies.

The existing social protections can be further expanded and deepened to be more inclusive and provide stronger support when individuals face adversity. **A universal social protection based on need rather than employment conditions and earnings** is one possible direction. For instance, universal health insurance coverage is already provided in economies such as Australia; Canada, Japan; and New Zealand.¹⁹² Discussions and progress are also seen on expanding employment-related social protection programs to include other non-standard employment forms, especially self-employment, independent contract work, or platform work without contracts. For example, to better protect individuals who are self-employed, Malaysia has introduced i-Saraan (previously known as 1Malaysia Retirement Savings Scheme (SP1M)) under the Employees Provident Fund (EPF) to allow more individuals regardless of their employment status (including those working in the gig economy), to make voluntary contributions and receive additional contributions from the government.¹⁹³ Denmark has improved the ability of the self-employed and other non-standard workers to access unemployment benefits. The new reform only requires one to meet a minimum taxable income over a three-year period to be eligible for the benefits regardless of the employment type.¹⁹⁴

Other policies have been explored by economies to provide a variety of protections to workers in light of changes wrought by the digital economy. For instance, Indonesia has introduced a compulsory accident insurance scheme for moto-taxi rides made through an online app, by automatically deducting

¹⁹¹ Carlos Kuriyama et al., 'APEC Regional Trends Analysis: Globalisation: The Good, The Bad, and the Role of Policy' (Singapore: APEC, May 2017), <http://publications.apec.org/Publications/2017/05/APEC-Regional-Trends-Analysis-Globalisation-The-Good-The-Bad-and-the-Role-of-Policy>.

¹⁹² International Travel Insurance Group, 'Countries with Free or Universal Health Care', accessed 23 August 2019, <https://www.internationalinsurance.com/health/countries-free-healthcare.php>.

¹⁹³ Employees Provident Fund (KWSP), Malaysia, 'i-Saraan: Securing Retirement with Voluntary Contribution', accessed 19 September 2019, <https://www.kwsp.gov.my/member/contribution/i-saraan>.

¹⁹⁴ OECD, *The Future of Social Protection*.

a small amount of the fare to insure both driver and passenger for the duration of the trip.¹⁹⁵ In responding to the fast development of the food delivery and logistics industries, Beijing's municipal government established several policy measures in early 2019 to enhance the working conditions of the delivery person. Measures include making sure that employers comply with labour regulations such as the need to employ workers using formal contracts and to include certain mandatory provisions (e.g., on-the-job injury compensation and medical insurance). Supplementary measures include providing housing assistance. Indeed, the city government will provide 2,400 public dormitory rooms for rent to local couriers to address the housing shortage issue.¹⁹⁶

Infrastructure

In 2018, the International Telecommunication Union (ITU) found that while most of the world's population live within mobile cellular coverage areas, only 51.2 percent or 3.9 billion people were using the internet.¹⁹⁷ Although universal, reliable and affordable access to ICT is essential to participate in the digital economy, access in many rural and remote areas remains inadequate. For example, 39 percent of the rural population in the United States lack access to high-speed fixed broadband services (at 25Mbps/3Mbps), while the number in urban areas is only 4 percent.¹⁹⁸ Disparities in critical ICT infrastructure limit the ability of people and businesses in those areas to participate in digital activities and seize new digital opportunities, further widening socio-economic gaps.

Governments have put in place **economy-wide programmes to improve the coverage, quality and affordability of their ICT infrastructure**. Canada's 'Connect to Innovate' program aims to expand its high capacity backhaul to rural and remote communities. The initiative is expected to improve connectivity for over 900 communities.¹⁹⁹ In Indonesia, one of the government's infrastructure priority projects is the Palapa Ring project, which aims to connect telecommunication and communication networks throughout the economy.²⁰⁰ Malaysia has established an economy-wide target of 1 percent of gross national income per capita for fixed broadband cost. So far, significant progress has been made. Entry level fixed broadband prices have decreased by over 40 percent through measures such as encouraging common infrastructure sharing and greater transparency in wholesale level pricing.²⁰¹ In Australia, the National Broadband Network (NBN) provides economy-wide high-speed broadband wholesale services through a mix of three technologies: optical fibre, fixed wireless, and next-generation satellite. The wholesale access price of the its services is fixed per user with no fees charged for a new connection or line rental, and users subscribe to the system through a third retailer. NBN is now available to approximately 80 per cent of Australian premises, and the government aims to increase the coverage to all Australian homes and businesses by mid-2020.²⁰²

¹⁹⁵ ILO and OECD, 'Promoting Adequate Social Protection and Social Security Coverage for All Workers, Including Those in Non-Standard Forms of Employment' (paper presented at the *1st Meeting of the G20 Employment Working Group*, Buenos Aires, Argentina, 20–22 February 2018), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_646044.pdf.

¹⁹⁶ Jill Shen, 'Beijing Begins Introducing Measures to Protect Gig-Economy Workers, Starting with Delivery Drivers', *TechNode*, 20 February 2019, <https://technode.com/2019/02/20/beijing-delivery-drivers-welfare/>; Wang Wei, '北京将为快递员提供 2400 套宿舍' [Beijing will provide 2400 dormitories for delivery person], *Beijing Youth Daily*, 20 February 2019, http://epaper.yinet.com/html/2019-02/20/content_319884.htm?div=-1.

¹⁹⁷ 'Access to and Use of ICTs Keep Growing but Stronger ICT Skills Needed to Connect People Everywhere', ITU, 11 December 2018, <https://www.itu.int/en/mediacentre/Pages/2018-PR41.aspx>.

¹⁹⁸ US Federal Communications Commission, US, *2016 Broadband Progress Report* (US Federal Communications Commission, 29 January 2016), https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf.

¹⁹⁹ APEC, *APEC Economic Policy Report 2018*.

²⁰⁰ From Indonesia's IER submission.

²⁰¹ From Malaysia's IER submission.

²⁰² From Australia's IER submission; Matthew L. James, 'National Broadband Network (NBN) – Budget Review 2013–14', Parliament of Australia, May 2013, https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview2013/4/NBN.

While public sector investment has driven the bulk of infrastructure development in the past and will likely continue to do so, economies will need to **mobilise private sector investment** to help meet funding requirements. This would entail economies implementing structural reforms to promote competition and improve procurement processes alongside supporting policies to allow private sector actors easier access to financing for infrastructure projects. For example, the Ultra-Fast Broadband (UFB) programme in New Zealand, which aims to connect 87 percent of New Zealanders in over 390 towns and cities to fibre by the end of 2022, is a public-private partnership between government and four companies with a total government investment of NZD 1.5 billion.²⁰³ In the United States, the American Broadband Initiative aims to direct the increased private investment in broadband infrastructure and services to fill broadband connectivity gaps in America by measures such as streamlining federal permitting processes and encouraging private companies to invest in telecommunications infrastructure, especially in rural areas.²⁰⁴ The USDA ReConnect Program offers up to USD 600 million in loans and grants to telecommunications companies, rural electric cooperatives and utilities, internet service providers and municipalities to build broadband infrastructure in rural America.²⁰⁵

Investment in hard digital infrastructure aside, governments would also need to put in place **policies geared toward ensuring that specific groups in society are not prevented from accessing infrastructure**. For instance, Mexico's Federal Telecommunications and Broadcasting Law prohibits discrimination in providing services based on ethnic origin, gender, age, social status, health conditions, religion, opinions and marital status among others.²⁰⁶ Governments should also consider providing funding and assistance to specific groups in society who have difficulty accessing these services. In Chinese Taipei, the government provides subsidies for people with disabilities to purchase assistive communication devices including mobile phones. It also encourages telecommunications operators to provide services tailored to people with disabilities such as special phone rental and sale services and telecommunication relay services. Funding is also provided for ICT projects that design communications devices for people with seeing, hearing, reading, and writing disabilities.²⁰⁷ In the United States, the Federal Communications Commission established the National Deaf-Blind Equipment Distribution Program in 2011. It provides up to USD 10 million a year to support local programmes which distribute equipment to low-income deaf and blind individuals so as to help them access telecommunications and internet services.²⁰⁸

Fiscal policy

Investments in infrastructure and other areas that are likely to support inclusive growth require governments to have sufficient fiscal space. The World Bank estimates that investments in human capital, basic social protection and productive opportunities for youth are likely to cost between 6 to 8 percent of GDP per year.²⁰⁹ At the same time, the digital economy has exacerbated the fiscal challenges that economies face (e.g., inadequate tax bases and large informal sectors). To increase their fiscal resources economies could enhance the capacity of their tax administration, close tax loopholes, and explore new sources of revenues, or expand those revenue sources that support inclusive growth such as property taxes²¹⁰.

²⁰³ From New Zealand's IER submission.

²⁰⁴ From the US IER submission.

²⁰⁵ From the US IER submission.

²⁰⁶ Mexican Congress, 'Federal Telecommunications and Broadcasting Law' (Federal Official Gazette, 1 June 2016), <http://www.ift.org.mx/sites/default/files/contenidogeneral/asuntos-internacionales/federaltelecommunicationsandbroadcastinglawmexico.pdf>.

²⁰⁷ Department of Communications and the Arts, Australia, 'Policies, Legislation, and Initiatives to Promote Access to ICTs for People with Hearing and/or Speech Impairment' (Singapore: APEC, October 2018), <https://www.apec.org/Publications/2018/10/Policies-Legislation-and-Initiatives-to-Promote-ICT-Access>.

²⁰⁸ Department of Communications and the Arts, Australia.

²⁰⁹ World Bank, *World Development Report 2019: The Changing Nature of Work* (Washington, DC: World Bank, 2019).

²¹⁰ OECD, 'Tax Policies for Inclusive Growth in a Changing World' (OECD Report to G-20 Finance Ministers and Central Bank Governors, July 2018), <http://www.oecd.org/g20/Tax-policies-for-inclusive-growth-in-a-changing-world-OECD.pdf>

The relative ease of shifting profits to lower-tax jurisdictions by firms, and the inherent difficulty of taxing some digital economy transactions (e.g., domestic services enabled through digital platforms and selling products through social media like Facebook and Instagram) can undermine existing tax bases. To tackle **base erosion and profit shifting (BEPS)** issues, the OECD established a BEPS Action Plan in 2013 and produced a set of 15 measures in 2015 to provide guidance on the domestic and international rules and instruments that economies can put in place to ensure that profits are taxed where the economic activities generating the profits are performed and where value is created.²¹¹ Their multilateral forum – the OECD/G20 Inclusive Framework on BEPS – now has more than 130 members accounting for over 95 percent of the world’s GDP.²¹² The implementation of the BEPS package is well under way, including in APEC economies.²¹³ (Refer to Box A.1 in Annex A for more information on efforts made under BEPS)

Improving the coverage of current taxation to include more digital activities is one way of increasing government revenue. For instance, Chinese Taipei enacted the Value-Added and Non-Value-Added Business Tax Act ("Business Tax Act") in 2017. The Act requires foreign enterprises without a fixed place of business in Chinese Taipei but selling services electronically into the economy to register and pay Value-Added Tax (VAT).²¹⁴ In Singapore, a goods and services tax (GST) is set to be imposed on B2C imported digital services (e.g., movie and music streaming) in 2020. Service providers without a physical presence in Singapore need to register themselves if their annual global turnover exceeds SGD 1 million, and sales to Singapore exceeds SGD 100,000.²¹⁵ Australia has introduced measures to extend GST to digital products and services that are imported by consumers in Australia from offshore. These include intangible supplies such as e-books, video streaming services or game downloads. The measure also includes services provided from offshore to consumers including legal and accountancy services supplied by offshore entities. The law applies to offshore vendors and electronic distribution platforms with Australian turnover of \$75,000 or more.²¹⁶

New taxes have also been explored by some economies, including a digital services tax (DST). This is a flat-rate tax on the total turnover of large technology firms or digital platforms in one economy. France recently passed legislation imposing a 3 percent DST on multinational digital services providers if their global turnover from digital services reaches EUR 750 million and the turnover in France reaches EUR25 million.²¹⁷ New Zealand is also considering applying a unilateral DST at a flat rate of 2 to 3 percent to the gross turnover of big multinational digital companies generated in New Zealand.²¹⁸ In introducing these taxes, it is important for economies to also take into consideration ongoing multilateral work to ensure alignment and consistency.

²¹¹ OECD, 'BEPS Actions', BEPS, accessed 15 September 2019, <http://www.oecd.org/tax/beps/beps-actions/>.

²¹² OECD, 'OECD/G20 Inclusive Framework on BEPS', BEPS, accessed 15 September 2019, <http://www.oecd.org/tax/beps/>; OECD, 'OECD/G20 Inclusive Framework on BEPS: Progress Report July 2017–June 2018' (Paris: OECD, June 2018), <https://www.oecd.org/ctp/inclusive-framework-on-beps-progress-report-june-2017-july-2018.htm>.

²¹³ OECD, 'Secretary-General Report to the G20 Finance Ministers and Central Bank Governors' (Paris: OECD, June 2019) and OECD, 'Third Annual Progress Report of the OECD/G20 Inclusive Framework on BEPS' (Paris: OECD, June 2019).

²¹⁴ Nicholas V. Chen and Kaian Yu, 'Taiwan Imposes VAT on Cross-Border E-Commerce Sales of Digital Services and Goods', *Mondaq*, 1 August 2018, <http://www.mondaq.com/x/724650/tax+authorities/Taiwan+Imposes+VAT+On+CrossBorder+ECommerce+Sales+Of+Digital+Services+And+Goods>.

²¹⁵ Kwang, 'Budget 2018: GST To Be Imposed on Digital Services from 2020'.

²¹⁶ Australian Taxation Office, 'Australian GST Registration for Non-residents', accessed 19 September 2019, <https://www.ato.gov.au/Business/International-tax-for-business/In-detail/Doing-business-in-Australia/Australian-GST-registration-for-non-residents/>.

²¹⁷ KPMG, 'France: Digital Services Tax (3%) Is Enacted', 25 July 2019, <https://home.kpmg/us/en/home/insights/2019/07/tnf-france-digital-services-tax-enacted.html>

²¹⁸ EY, 'New Zealand Government To Seriously Consider a Digital Services Tax', 5 June 2019, <https://www.ey.com/gl/en/services/tax/international-tax/alert--new-zealand-government-to-seriously-consider-a-digital-services-tax>.

C. Address structural barriers through reforms and supporting policies

In many cases, increasing inclusion requires that structural reforms be complemented by an array of supporting policies. There are barriers to inclusion that can only be addressed by programmes that change attitudes, level the playing field or encourage individuals and groups that previously had not done so to participate in digital economy. Such supporting policies should be aligned with market-enhancing structural reforms. This section will focus on reforms and policies that address barriers to innovation in the digital economy and those faced by women and MSMEs. The approach can just as easily be applied to other groups that have historically been excluded from or underrepresented in the digital economy. The objective of this section is to illustrate the application of Approach III from the EC's Three Approaches document to the challenge of promoting inclusion with respect to the digital economy. However, it should be noted that efforts to promote innovation and enable women, MSMEs and groups that have been excluded in the past are likely to enhance efforts to promote societal inclusion, per Approach II (covered in Section B).

Promote innovation and boost productivity of some sectors and firms

Promoting innovation and boosting productivity in the digital economy require at least two conditions: (1) adoption of relevant technologies and tools; and (2) a conducive environment for the utilisation of these technologies and tools. Specifically, on the former, adoption varies between sectors and firms. For example, McKinsey finds that even in developed economies like the United States, only 18 percent of its digital potential has been captured, with industries such as mining and construction remaining largely undigitised.²¹⁹ With regard to the latter, despite being a critical input to technologies such as AI, the literature has shown that data sharing is not prevalent. According to a study by the Economist Intelligence Unit, 36 percent of respondents identified the unwillingness to share data as an impediment to innovation.²²⁰ In response to these issues, this section discusses some of the options available to policymakers.

1. Promote research and development

Policymakers can provide **research and development (R&D) incentives** to encourage firms to experiment and incorporate new digital technologies into their businesses. Economies have approached this in various ways with Australia providing tax offsets to incentivise companies to invest in R&D.²²¹ China has expanded the coverage of its 175 percent tax deductible rate for R&D activities from only technology MSMEs to all Chinese enterprises.²²²

There is also value in complementing structural reform with supporting policies that promote **greater collaboration between research institutions and businesses** to ensure that firms have avenues to engage more actively in research networks. Governments can support this process through the development of geographically concentrated clusters of firms to encourage flow of knowledge and human capital, as well as to promote cross-sectoral and international interactions.²²³ Canada's Innovation Superclusters Initiative is one such example (see Box 3.4.).

²¹⁹ Manyika et al., 'Digital America: A Tale of the Haves and Have-Mores'.

²²⁰ The Economist Intelligence Unit, 'The Hype and the Hope – The Road to Big Data Adoption in Asia-Pacific' (London: The Economist, 2013), https://eiperspectives.economist.com/sites/default/files/HDS_exec%20summary_FINAL.pdf.

²²¹ Australian Taxation Office, 'Research and Development Tax Incentive', modified 23 June 2017, <https://www.ato.gov.au/Business/Research-and-development-tax-incentive/?default>.

²²² EY, 'China Expands R&D Super Deduction Rate to All Enterprises', 8 October 2018, <https://www.ey.com/gl/en/services/tax/international-tax/alert--china-expands-r-and-d-super-deduction-rate-to-all-enterprises>.

²²³ OECD, 'Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a More Responsible and Inclusive Globalisation' (Second OECD Conference of Ministers responsible for Small and Medium-sized Enterprises (SMEs), Istanbul, Turkey: OECD, 2004), <https://doi.org/10.1787/9789264044357-en>; OECD, *OECD SME and Entrepreneurship Outlook 2019* (Paris, France: OECD, 2019), <https://doi.org/10.1787/34907e9c-en>.

Box 3.4. Forming superclusters for innovation in Canada

Pre-reform: Canada has built knowledge and technological advantages in areas such as quantum computing, machine learning, blockchain, fintech, AI, autonomous vehicles and 5G. Canada is ranked 5th in creative thinking and 9th in problem-solving in a technology-rich environment among OECD economies. Despite these successes, Canada's R&D indicators have been falling in global rankings and R&D expenditures have dropped in recent years. Moreover, adoption of new technologies by its firms has lagged.

Response: Although indirect measures (e.g., tax incentives) had been Canada's main policy tools previously, it has begun to look for more direct ways to connect businesses, governments, academic and research institutions so as to mobilise innovation. This led to Canada's Innovation and Skills Plan which was released in 2017 with the Innovation Superclusters Initiative (ISI) being a centrepiece of the plan. To support the ISI, the government will be providing funding of up to CAD 950 million over 5 years for five business-led innovation "superclusters" to accelerate Canada's economic growth in the following areas: digital technology; protein industries; next generation manufacturing; AI-powered supply chains (SCALE.AI); and oceans (see below).

	Supercluster	Location	Types of activities
	<u>Canada's Digital Technology Supercluster</u>	British Columbia	Using virtual, mixed, and augmented reality, data, and quantum computing to improve service delivery in the natural resources, precision health and manufacturing sectors.
	<u>Protein Industries Canada Supercluster</u>	The Prairie provinces	Using plant genomics and novel processing technology to increase the value of key Canadian crops.
	<u>Next Generation Manufacturing Supercluster</u>	Ontario	Building up next-generation manufacturing by adopting advanced processes and by developing and deploying new technologies like internet of things, robotics and 3D printing.
	<u>AI-Powered Supply Chains Supercluster (SCALE.AI)</u>	Quebec and spanning the Quebec-Windsor Corridor	Bringing the retail, manufacturing, transportation, infrastructure, and ICT sectors together to build intelligent supply chains through artificial intelligence and robotics.
	<u>Canada's Ocean Supercluster</u>	Atlantic Canada	Harnessing emerging technologies to strengthen Canada's ocean industries, such as marine renewable energy, fisheries, aquaculture, oil and gas, defense, shipbuilding, and transportation.

Each supercluster will receive either up to CAD 153 million or up to CAD 230 million, with industry players matching these contributions at least dollar-for-dollar. Each will be led by an industry-driven, membership-based not-for-profit organisation, which selects projects and acts as a central organising body.

Impact: The selected proposals brought together more than 450 businesses, 60 post-secondary institutions and 180 other partners. All five superclusters are now in operation, and are expected to create over 50,000 jobs and add more than CAD 50 billion to the Canadian economy over the next 10 years.

Challenges and lessons: One key challenge was to activate as many high-potential industries and firms as possible, and to motivate them to come together around transformative proposals. This gave rise to a high-quality shortlist but it also generated high expectations among sectors, with keen interest in the government's ultimate selections. In response, Innovation, Science and Economic Development Canada (ISED) officials, other relevant federal organisations, third-party contractors, and expert reviewers administered a rigorous assessment of proposals. The assessment considered the ultimate value the applications would deliver for Canada, including the potential to create jobs. It also considered the superclusters' plans to increase the representation of women and other underrepresented groups in supercluster activities and leadership, and help them succeed in skilled jobs in highly innovative industries.

Another challenge was to encourage applicants to come together in new ways to achieve transformative results that will extend beyond their existing partnerships and lines of business. For many applicants, this challenge meant that they needed to think about shared challenges and interests in disruptive technologies, and how they might advance these interests by collaborating in new ways (including sometimes with their competitors). To bring new partners together around shared priorities, supercluster staff work actively with industry partners to think beyond the status quo, help shape projects, and promote frictionless collaboration. Projects are also evaluated for their benefits to the members' broader ecosystems, which provide incentive for them to consider potential partners and applications beyond their direct interests.

Source: Adapted from Canada's case study submission

2. Support for upgrading by firms particularly MSMEs

Some firms, especially MSMEs, can struggle with skills shortages and poor management practices. The rise of the digital economy, where firms need to employ digital technologies and tools to improve their productivity and maintain their competitiveness, may exacerbate this situation. For instance, MSMEs find it harder to develop, exploit and protect intellectual property (IP) and leverage other intangibles than larger firms. MSMEs may also not be familiar with new technologies such as cloud computing and their benefits. Consequently, there is room to provide MSMEs with information and **skills training programmes** geared to the digital economy. For instance, Indonesia's Regional IT Centers of Excellence (RICE) provide ICT-related training and seminars to start-ups in growth industries.²²⁴ In Singapore, the government launched a portal to make training programmes available to owners and directors of MSMEs which has attracted more than 10,000 users.²²⁵

Despite the availability of training programmes, data on OECD economies shows that employees of MSMEs participate in 50 percent fewer training activities compared to larger firms. Their lack of participation is usually driven by factors such as cost and lack of access to formal training opportunities. Additionally, in terms of cost of employee time, many MSMEs lack the critical mass that would enable them to allow employees to participate in training.²²⁶ To overcome some of these challenges, supporting policies such as **co-investment to participate in training programme** could be required in some cases. For instance, Hong Kong, China has launched the Reindustrialization and Technology Training Programme (RTTP) to subsidise firms on the cost of training their staff with digital skills deemed relevant for Industry 4.0.²²⁷ Similarly, Singapore provides 'enhanced training support' that includes subsidies of up to 90 percent of course fees for participating MSMEs.²²⁸

²²⁴ Tan and Tang, 'Managing Skills Challenges in ASEAN-5'.

²²⁵ Sue-Ann Tan, 'New Portal for SME Bosses to Reskill and Deepen Knowledge', *The Straits Times*, 14 March 2019, <https://www.straitstimes.com/business/new-portal-for-sme-bosses-to-reskill-and-deepen-knowledge>.

²²⁶ OECD, *Skills Development and Training in SMEs* (Paris: OECD, 2013), <https://doi.org/10.1787/9789264169425-en>.

²²⁷ Vocational Training Council, Hong Kong, China, 'Reindustrialisation and Technology Training Programme', accessed 19 September 2019, <http://rttp.vtc.edu.hk/>.

²²⁸ Enterprise Singapore, 'Enhanced Training Support for SMEs', SME Portal, modified 1 April 2019, <https://www.smeportal.sg/content/smeportal/en/moneymatters/grants/enhanced-training-support-for-smes.html>.

Furthermore, MSMEs usually require **support in identifying, adopting and applying new technologies** including ICT hardware and software into their businesses. Economies have rolled out some programmes to help firms on this front. In 2019, under the new Tech-celerate for Law programme, Singapore launched a one-year initiative providing funding of up to 70 percent for the adoption of new technologies by law firms. Its support now extends to more than just baseline solutions (e.g., online legal research and document management), but also advanced ones which such as AI.²²⁹

3. Increase data sharing between firms

Although technical, economic and social factors may determine the pace and extent of technology adoption, one way to promote the diffusion of technology across wider segments of the business community including MSMEs and non-frontier firms²³⁰ is to encourage greater data sharing. Access and analysis of valuable data have improved productivity in many frontier firms especially those in the technology sector. Data can be used by firms to create better quality products as well as to customise products to fit the needs of consumers. Without access to such data, which are usually collected by frontier firms such as platforms, it would be challenging for non-frontier firms to improve their productivity. This has led to discussions on whether existing competition policies can be enhanced to address issues such as data sharing, portability and interoperability. This is yet another illustration of why efforts to regulate the digital economy cannot be conducted in silos. For example, it is easy to foresee a situation where an economy's data security regulations or policy on data sharing could either reinforce or work at cross-purposes with other objectives of competition policy, such as encouraging new entrants and greater participation of MSMEs in the digital economy.

One way forward would be to create mechanisms that facilitate **data portability** between firms. Besides reducing the switching costs for consumers and hence allowing them to change service providers easily,²³¹ such mechanisms lower barriers to entry for new market players as they would no longer need an established customer base to compete effectively with incumbents.²³² The new players could also use the data to improve their products and services. For instance, Australia's Consumer Data Right was implemented to allow consumers to better compare products and services, and also to increase data transparency and promote competition between service providers. It is expected to be rolled out to the banking sector in 2019.²³³ Data portability has also been put in place by economies outside of APEC. The European Union's General Data Protection Regulation (GDPR) mandates data portability.²³⁴

Another option is for governments to create **data sharing frameworks and guidelines**, including on ways to ensure that datasets do not contain personally identifiable information. Singapore is addressing these challenges through a framework introduced by the Infocomm Media Development Authority and the Personal Data Protection Commission. This framework helps firms navigate the complexities of exchanging consumer data with other firms as well as provide information on: strategies and models through which firms can share data; anonymising and transmitting personal data; regulatory

²²⁹ Fiona Lam, 'Bigger S\$3.68m Scheme Launched To Boost Tech Use by Singapore Law Firms', *The Business Times*, 2 May 2019, <https://www.businesstimes.com.sg/government-economy/bigger-s368m-scheme-launched-to-boost-tech-use-by-singapore-law-firms>.

²³⁰ Non-frontier firms are those firms that are not at the productivity frontier and hence less productive than frontier firms.

²³¹ Joshua Gans, 'Enhancing Competition with Data and Identity Portability' (Washington, DC: The Hamilton Project, June 2018), https://www.hamiltonproject.org/assets/files/Gans_20180611.pdf.

²³² Personal Data Protection Commission, and Competition and Consumer Commission of Singapore, 'Discussion Paper on Data Portability' (Singapore: Personal Data Protection Commission, 25 February 2019), <https://www.pdpc.gov.sg/-/media/Files/PDPC/PDF-Files/Resource-for-Organisation/Data-Portability/PDPC-CCCS-Data-Portability-Discussion-Paper--250219.pdf>.

²³³ Australian Competition and Consumer Commission, 'Consumer Data Right (CDR)'.

²³⁴ European Commission, 'Guidelines on the Right to Data Portability' (16/EN WP 242 rev.01, 5 April 2017), https://ec.europa.eu/newsroom/article29/item-detail.cfm?item_id=611233.

consideration and required safeguards; as well as on good data sharing practices that ensure transparency and accountability.²³⁵

Supportive business environment for MSMEs

Efforts taken under the Ease of Doing Business (EoDB) Initiative have improved the business environment for all firms, with APEC economies collectively registering progress across five of the World Bank's Doing Business priority areas between 2016 and 2017.²³⁶ Despite the progress made, there is a risk that economies' efforts to reduce the regulatory burden and promote EoDB do not go far enough in taking into account the inherent challenges facing MSMEs. Given that a significant proportion of individuals in the APEC region are entrepreneurs or owners or employees of MSMEs, ensuring that MSMEs have access to tools, information and financing so that they can fully participate in the digital economy is an inclusion issue that needs to be addressed on an urgent basis.

1. Reducing impact of regulation

MSMEs are often disproportionately affected by a complex regulatory environment as they tend to be less efficient than larger firms and have fewer resources.²³⁷ The OECD notes that, on average, MSMEs bore over five times the compliance costs per employee as compared to larger companies, and that reduction in business regulations can greatly reduce MSMEs' fixed costs, thereby levelling the playing field in the market.²³⁸ Additionally, Bickerdyke and Lattimore have found that compliance cost as a proportion of turnover declined with respect to a firm's size.²³⁹ As such, minimising the impact of regulations on MSMEs would likely improve their ability to better adapt and grow within the digital economy.

Holistic policy frameworks for MSMEs. One possible reform mentioned in a study by the APEC Policy Support Unit is the **creation of government agencies** dedicated to MSMEs.²⁴⁰ Through direct interactions with MSMEs, such agencies would be able to better identify challenges faced by MSMEs and propose adjustments to existing policies as well as suggest new policies for their benefit.

Improved government services. Government agencies can also serve as one-stop shops for MSMEs to apply for licenses and other documents. For instance, Enterprise Singapore has established a business grant portal that makes it easier for MSMEs to search for business solutions and apply for grants.²⁴¹ Russian Small and Medium Business Corporation (RSMB Corporation) has set up the SME Business Navigator to consolidate relevant information for MSMEs in a single portal (see Box 3.5.). In a similar vein, the Korea SMEs and Startups Agency (KOSME) integrates all MSME government support into one agency, thereby creating a unified channel to provide policy information.²⁴²

²³⁵ Jun Sen Ng, 'New Framework Launched To Boost Trust in Data Sharing among Companies', *TODAY*, 28 June 2019, <https://www.todayonline.com/singapore/new-framework-launched-boost-trust-data-sharing-among-companies>.

²³⁶ Carlos Kuriyama, Denise Cheok and Divya Sangaraju, 'APEC's Ease of Doing Business – Interim Assessment 2015–2017' (Singapore: APEC, August 2018), <https://www.apec.org/Publications/2018/08/APECs-Ease-of-Doing-Business>.

²³⁷ OECD, 'Improving the Business Environment for SMEs through Effective Regulation' (*SME Ministerial Conference*, Mexico City, Mexico, 2018), <https://www.oecd.org/cfe/smes/ministerial/documents/2018-SME-Ministerial-Conference-Parallel-Session-1.pdf>.

²³⁸ OECD, *Businesses' Views on Red Tape* (Paris: OECD, 2001), https://read.oecd-ilibrary.org/governance/businesses-views-on-red-tape_9789264193468-en.

²³⁹ Ian Bickerdyke and Ralph Lattimore, 'Reducing the Regulatory Burden: Does Firm Size Matter?' (Canberra: Industry Commission, 1997), <https://www.pc.gov.au/research/supporting/regulatory-burden-firm-size/regburd.pdf>.

²⁴⁰ Ben Shepherd, Olivier Cattaneo and Charles Tsai, 'Regulatory Reform Case Studies on Improving the Business Environment for Small and Medium Enterprise' (Singapore: APEC, November 2015), <http://publications.apec.org/Publications/2015/11/Regulatory-Reform-Case-Studies-on-Improving-the-Business-Environment-for-Small-and-Medium-Enterprise>.

²⁴¹ Lee, 'Singapore Budget 2019: SMEs Go Digital Programme To Be Expanded'.

²⁴² Sangjik Lee, 'Korea SMEs and Startups Agency – Message from the President', accessed 23 August 2019, <https://www.kosmes.or.kr/sbc/SH/EHP/SHEHP005M0.do>.

Box 3.5. Russia's SME Business Navigator

Pre-reform: Improving the investment climate has long been a priority of Russia. Since 2012, Russia had introduced and implemented 12 roadmaps which include actions to digitalise public services related to business processes. Among the achievements of these roadmaps are online company registration, payment of customs duties, submission of customs transit declaration, and registration of property titles. However, several challenges remain, including the lack of entrepreneurship education as well as the absence of centralised information both on public support for SMEs and the regulatory prerequisites to start and run a business.

Response: To deal with these gaps, Russia introduced the SME Business Navigator in 2016. It serves as a one-stop shop to allow entrepreneurs to access a range of services. Some examples of services provided are:

- Creation of a preliminary business plan
- Information on bank loans and application for a guarantee
- Information on public support measures for SMEs
- Checking trustworthiness of partners
- Information on legal, accounting and management challenges on the help desk
- Preparation to exit from business

Impact: From its launch in 2016 to August 2019, 4.8 million unique users had visited the portal and the number of registered users had increased to 1.9 million. Additionally, the number of registered SMEs using the services provided reached 1.4 million in August 2019. Among the most popular services provided by the portal are checking the trustworthiness of partners, estimation of market niche and search for public procurement. Moving forward, the SME Business Navigator Portal will be integrated with the Public Services Portal to better support SME measures as well as technology and industrial parks.

Source: Adapted from Russia's case study submission and SME Business Navigator Portal website²⁴³

Regulatory tiering, or varying regulatory requirements according to firm size, is another way to make adhering to regulations less burdensome for MSMEs. This could be in the form of exemptions (e.g., exempting MSMEs from the substantive requirements of a regulation) and/or lighter requirements (e.g., less burdensome reporting and record keeping requirements). Regulatory tiering does not mean allowing MSMEs to act in a way that is contrary to the public policy objectives behind laws and regulations. Rather, it involves ensuring that MSMEs are not subjected to unnecessary requirements given their size. This can be implemented by exempting regulations for MSMEs where possible, or offering a partial exemption if a full exemption would make the regulation irrelevant. Economies can create thresholds for such exemptions based on specific criteria but these should be regulated such that firms are not dependent on these exemptions.²⁴⁴ For example, regulatory tiering has been implemented in Singapore where MSMEs with revenue below SGD 5 million are no longer required to provide

²⁴³ JSC RSMB Corporation, 'SME Business Navigator', Information Resources Portal, accessed 11 September 2019, <https://smbn.ru/msp.htm>.

²⁴⁴ European Commission, 'Models To Reduce the Disproportionate Regulatory Burden on SMEs: Report of the Expert Group' (Brussels: European Commission, May 2007), <https://ec.europa.eu/docsroom/documents/10037/attachments/1/translations/en/renditions/native>.

audited financial statements to participate in government tenders.²⁴⁵ The EU GDPR includes an exemption for organisations with fewer than 250 employees with regard to data record-keeping.²⁴⁶

Yet another way to minimise regulatory burden to MSMEs is to implement **regulatory impact assessment** (RIA). This can be done, for example, by disaggregating the calculations of regulatory costs and benefits by firm size, thereby enabling the cost impacts of regulations on MSMEs vis-à-vis their larger counterparts to be assessed. In turn, they can then be used as inputs to ensure that new regulations do not unduly burden MSMEs. The European Union has implemented the SME test to analyse the impact of legislative proposals. It includes consulting MSMEs, identifying affected businesses and analysing the impact of alternative measures.²⁴⁷ Among APEC economies, Viet Nam has required RIA to be conducted in the early stages of the rule-making process for all legal documents since 2016.²⁴⁸ In the United States, the Regulatory Flexibility Act requires the federal government to determine the impact of regulations on small businesses and explore alternative solutions to reduce their impact on MSMEs. Subsequently, these evaluations are submitted to the Small Business Association for comments.²⁴⁹ Canada has adopted a Small Business Lens as part of its RIA that requires its regulators to consider the impact that regulations have on small business to ensure they do not have unintended consequences.²⁵⁰

2. Improving access to credit

Apart from the burden of compliance with new and existing regulations, MSMEs often find it difficult to access credit for various reasons including asymmetric information, lack of collateralisation due to the lack of fixed assets and limited credit history from inability to access to traditional financing sources.²⁵¹ As an indication of this challenge, the median interest rate spread between MSMEs and larger firms in the OECD has increased from 0.82 percentage points in 2008 to 1.40 percentage points in 2015.²⁵² Consequently, limited access to finance may prevent MSMEs from investing in or utilising digital technology and tools despite their falling costs. A study by Bain & Company finds only 16 percent of MSMEs in ASEAN to be truly digitalised.²⁵³

One way to improve the situation is for governments to **adopt risk-sharing principles for MSME financing** through mechanisms such as credit guarantees, securitisation and insurance.²⁵⁴ For instance, Malaysia has created a Credit Guarantee Corporation to offer guarantees and loans to improve the credit

²⁴⁵ Bei Yi Seow, 'Rules Eased for SMEs Bidding for Public Projects', *The Straits Times*, 17 August 2018, <https://www.straitstimes.com/singapore/rules-eased-for-smes-bidding-for-public-projects>.

²⁴⁶ Small Business Team of the Bonhill Group, 'What Does GDPR Mean to Me and My Small Business?', [smallbusiness.co.uk](https://smallbusiness.co.uk/what-does-gdpr-mean-business-2538556/), 17 October 2018, <https://smallbusiness.co.uk/what-does-gdpr-mean-business-2538556/>.

²⁴⁷ European Commission, 'SME Test', https://ec.europa.eu/growth/smes/business-friendly-environment/small-business-act/sme-test_en.

²⁴⁸ Joseph Lemoine, 'Global Indicators of Regulatory Governance: Worldwide Practices of Regulatory Impact Assessments' (Washington, DC: World Bank, 2018), 10, <http://documents.worldbank.org/curated/en/905611520284525814/Global-Indicators-of-Regulatory-Governance-Worldwide-Practices-of-Regulatory-Impact-Assessments.pdf>.

²⁴⁹ Jacqueline Snijders et al., 'SME Promotion Agencies: Is There a Best Set-up? A Quest for Good Practices' (Geneva: International Labour Organization, 2016), https://ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/publication/wcms_532833.pdf.

²⁵⁰ Government of Canada, 'Small Business Lens', modified 8 July 2016, <https://www.canada.ca/en/treasury-board-secretariat/services/federal-regulatory-management/small-business-lens.html>.

²⁵¹ World Bank, 'Improving Access to Finance for SMEs: Opportunities through Credit Reporting, Secured Lending and Insolvency Practices' (Washington, DC: World Bank, May 2018), <https://www.doingbusiness.org/content/dam/doingBusiness/media/Special-Reports/improving-access-to-finance-for-SMEs.pdf>.

²⁵² OECD, *Financing SMEs and Entrepreneurs 2017: An OECD Scoreboard* (Paris: OECD, 2017), https://doi.org/10.1787/fin_sme_ent-2017-en.

²⁵³ Florian Hoppe, Tony May and Jessie Lin, 'Advancing towards ASEAN Digital Integration: Empowering SMEs To Build ASEAN's Digital Future' (Bain & Company, 2018), http://mddb.apec.org/Documents/2019/EC/WKSP2/19_ec_wksp2_006.pdf.

²⁵⁴ Miriam Koreen and André Laboul, 'G20/OECD High-Level Principles on SME Financing' (2015 G20 Antalya Summit, Antalya, Turkey, 2015), <https://www.oecd.org/finance/G20-OECD-High-Level-Principles-on-SME-Financing.pdf>.

worthiness of MSMEs.²⁵⁵ Similarly, Indonesia has launched both central and regional credit guarantee programmes such as the Indonesia Entrepreneur Credit Guarantee Institution (PKPI) and the Regional Credit Guarantee Corporation (Perum Jamkrida).²⁵⁶

In addition, governments can **reduce information asymmetries pertaining to MSMEs** by creating or enhancing the credit information infrastructure. This could include complementing the use of traditional information with non-traditional information (e.g., payment to retailers) to expand the data sources used in compiling credit information.²⁵⁷ Within APEC, Thailand has created FICO SME scores to allow financial institutions to evaluate the creditworthiness of MSMEs. The score aims to provide an indication of an SME's probability of delinquency based on data from the National Credit Bureau of Thailand and the Business Online Public Company Limited.²⁵⁸ Malaysia has established the Credit Guarantee Corporation (CGC) to offer services such as credit information.²⁵⁹

Enhancing gender equality

Enabling greater participation by all segments of the society is key to the effective utilisation of human capital and to achieving inclusive growth. Data from the ILO indicate that female participation in the labour force lags behind males in APEC economies (see Figure 3.5). The digital economy could potentially widen the gender gap, particularly if women are disadvantaged or face barriers that prevent them from benefiting from the opportunities brought by the digital transformation. Statistics show that on average, women are 26 percent less likely than men to own a smartphone. Fewer women who are active internet users, and the internet penetration rate among women is lower than that of men (45 vs. 51 percent).²⁶⁰

Women in digital economy jobs. Women are also less represented in technology-related occupations. Globally, men are four times more likely than women to become ICT specialists.²⁶¹ Based on LinkedIn data, only 22 percent of AI professionals are female despite both genders having acquired AI skills at approximately the same rate.²⁶² Moreover, women take up less than 20 percent of leadership roles and account for only 27 percent of all jobs in the software and IT services industry.²⁶³ The OECD also finds that only 0.5 percent of girls aspire to become ICT professionals at age 15, while the number is 5 percent for boys across OECD economies.²⁶⁴

²⁵⁵ Credit Guarantee Corporation, 'Credit Guarantee Corporation Malaysia Berhad – Mission', CGC, 2014, https://www.cgc.com.my/?page_id=5750#mission.

²⁵⁶ Naoyuki Yoshino and Farhad Taghizadeh-Hesary, eds, *Unlocking SME Finance in Asia: Roles of Credit Rating and Credit Guarantee Schemes* (New York: Routledge, 2019), 193.

²⁵⁷ World Bank, 'Improving Access to Finance for SMEs'.

²⁵⁸ World Bank.

²⁵⁹ United Overseas Bank, Dun & Bradstreet and EY, 'ASEAN SMEs: Are You Transforming for the Future?' (EY, 2018), <http://www.dnb.com.sg/pdfN/newsletter/ey-asean-smes-are-you-transforming-for-the-future.pdf>.

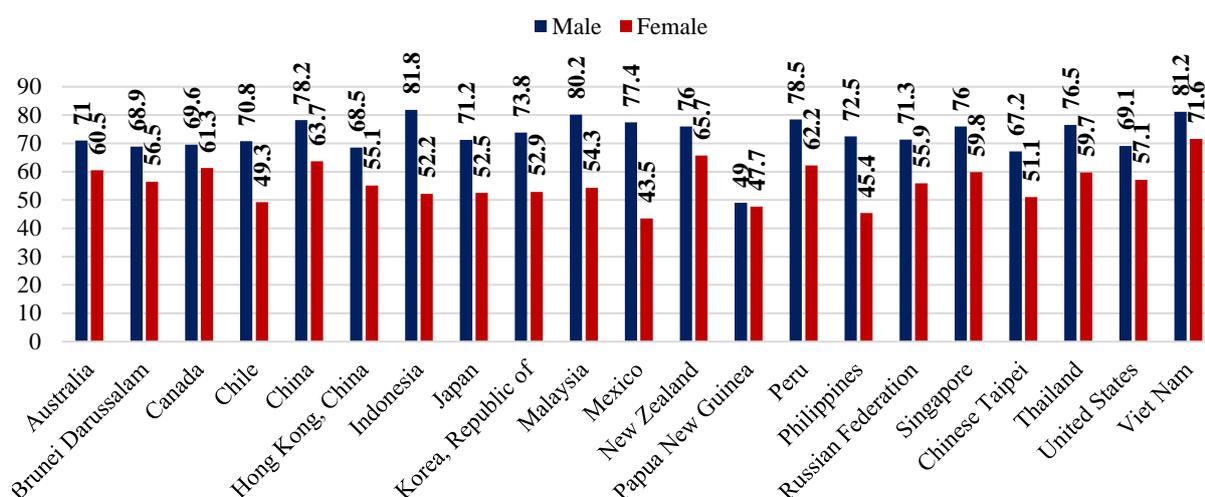
²⁶⁰ OECD, *Bridging the Digital Gender Divide: Include, Upskill, Innovate* (Paris: OECD, 2018), <https://www.oecd.org/going-digital/bridging-the-digital-gender-divide-key-messages.pdf>.

²⁶¹ OECD.

²⁶² World Economic Forum, *The Global Gender Gap Report 2018* (Geneva: World Economic Forum, 2018), http://www3.weforum.org/docs/WEF_GGGR_2018.pdf.

²⁶³ World Economic Forum, *The Global Gender Gap Report 2017* (Geneva: World Economic Forum, 2017), http://www3.weforum.org/docs/WEF_GGGR_2018.pdf.

²⁶⁴ OECD, *Bridging the Digital Gender Divide: Include, Upskill, Innovate*.

Figure 3.5: Labour force participation rate (%), aged 15+ for latest available year

Source: Compiled by APEC Policy Support Unit based on data from ILO Statistics, and the Census and Statistics Department of Hong Kong, China (see International Labour Organization, 'ILO Statistics', accessed 12 June 2019, <https://www.ilo.org/ilostat>; The Census and Statistics Department of Hong Kong, China, 'Labour Force', accessed 13 September 2019, <https://www.censtatd.gov.hk/hkstat/sub/sp200.jsp?tableID=007&ID=0&productType=8>)

Note: Data from latest available year are evaluated from either the labour force survey, population census and household income/expenditure survey. Latest available year for economy data are as indicated in brackets: Australia (2018); Brunei Darussalam (2017); Canada (2018); Chile (2018); China (2010); Hong Kong, China (2018); Indonesia (2017); Japan (2018); Korea (2018); Malaysia (2016); Mexico (2018); New Zealand (2018); Papua New Guinea (2010); Peru (2018); Philippines (2018); Russian Federation (2018); Singapore (2017); Chinese Taipei (2018); Thailand (2018); United States (2018); and Viet Nam (2017).

Various factors contribute to the observed gender divide. **First**, cultural norms may require women to do more domestic work than men. Indeed, data from UN Women reveal that women do 2.6 times the amount of unpaid care and domestic work than men do, which leads to less time to dedicate to their careers.²⁶⁵ **Second**, women are more affected by the absence of pro-inclusion regulations and social support, including maternity leave and childcare support. As an illustration, in 2018, the World Bank found that equal remuneration for work of equal value to be mandated by law only in 7 out of 21 APEC economies. Only half (11) of APEC economies offer 100 percent maternity leave benefits or parental leave benefits when maternity leave is unavailable. Additionally, only nine economies in the region prohibit discrimination by creditors on the basis of gender.²⁶⁶

A **third** factor that influences the digital gender divide is affordability and accessibility of internet and digital devices. A **fourth** factor is the lower digital illiteracy of women relative to men. This can be affected by biased socio-cultural norms and expectations that make girls less confident in maths and science courses.²⁶⁷ Collectively, the aforementioned factors can translate into a less favourable environment for girls and women to use digital technologies and seek employment in the digital economy.

Government interventions consisting of structural reforms, and supplementary reforms and supporting policies (see Box 3.2.) can be deployed to improve gender inclusion and bring more diversity to the digital economy. The World Bank notes 274 **reforms to laws and regulations** aimed at improving

²⁶⁵ UN Women, ed., *Turning Promises into Action: Gender Equality in the 2030 Agenda for Sustainable Development* (New York: UN Women, 2018), <http://www.onumulheres.org.br/wp-content/uploads/2018/02/SDG-report-Gender-equality-in-the-2030-Agenda-for-Sustainable-Development-2018-en.pdf>.

²⁶⁶ World Bank, *Women, Business and the Law 2019: A Decade of Reform* (Washington, DC: World Bank, 2019), <https://openknowledge.worldbank.org/bitstream/handle/10986/31327/WBL2019.pdf?sequence=4&isAllowed=y>.

²⁶⁷ OECD, *Bridging the Digital Gender Divide: Include, Upskill, Innovate*.

gender equality in 131 economies.²⁶⁸ These reforms came in various forms, including removing barriers for women to register businesses and open bank accounts, eliminating discrimination in social programs and employment, including by prohibiting the dismissal of pregnant women, enforcing mandatory paid maternity and paternity leave and improving working conditions for women including through laws and regulations prohibiting sexual harassment in the workplace. Other reforms are aimed at ensuring that women have equal access to education, financial services and other social and digital infrastructure. For instance, Maldives passed the Gender Equality Act in 2016, which mandates that financial institutions have to ensure that men and women have equal access to financial services and facilities.²⁶⁹

Besides reforming regulations, supporting policies such as **programmes and initiatives to raise awareness, provide training and mentorship, advocate gender equality and address gender stereotype** are vital to address structural barriers and create an enabling social and economic environment for women to participate in the digital economy. For instance, many programs have been put in place to encourage women and girls to pursue studies and careers in ICT and STEM. In Argentina, the *Ellas Hacen (They Do)* programme aims to improve digital literacy among unemployed women, and equip them with digital skills and technologies. In Mexico, *NiñaSTEM PUEDEN*, started in 2017, aims to create a professional network by inviting successful working women to mentor and encourage young students to participate in STEM studies.²⁷⁰ Similarly, the Australian government has adopted a series of measures such as expanding the Science in Australia Gender Equity (SAGE) pilot, and supporting the inaugural Women in STEM Ambassador, and a ‘Girls in STEM’ Toolkit to foster school-age girls’ interest in a STEM career.²⁷¹

Other supporting programmes focus on **improving ease of doing business for women and creating a more women-friendly business and working environment**. For example, Canada’s Women Entrepreneurship Strategy (WES) helps women grow their businesses through better access to financing, talent, networks and expertise. Since 2018, CAD 30 million has been allocated to the Women Entrepreneurship Fund and more than 325 projects at women-owned and -led businesses across Canada have been funded to pursue market opportunities abroad and to support scale-up, expansion and growth.²⁷² In Australia, the Future Female Entrepreneurs Program organises workshops and provides mentoring to help young women and girls to start their own small business. The Boosting Female Founders Initiative provides targeted funding to support women-led startups.²⁷³

Finally, it is possible to put in place cross-cutting approaches to ensure that gender issues are taken into account in the policymaking process and the implementation of structural reforms. The 2018 Canadian Gender Budgeting Act requires the government to take into account gender impacts of policies for all Canadians in the budget process.²⁷⁴ Other tools to mainstream gender concerns include Gender-based Analysis Plus (GBA+), which in 2016 became mandatory for all Memoranda to Cabinet and Treasury Board submissions and is now used across government departments in Canada.²⁷⁵

At the international level, ITU initiated the International Girls in ICT Day in 2018 to encourage girls and women to study for and pursue careers in the ICT sector. It has so far engaged over 377,000 girls

²⁶⁸ World Bank, *Women, Business and the Law 2019*.

²⁶⁹ World Bank.

²⁷⁰ Danielle Simone Robinson et al., ‘Digital Jobs for Youth: Young Women in the Digital Economy’ (Washington, DC: World Bank, 2018), <http://documents.worldbank.org/curated/en/503651536154914951/Digital-Jobs-for-Youth-Young-Women-in-the-Digital-Economy>.

²⁷¹ From Australia’s IER submission.

²⁷² From Canada’s IER submission.

²⁷³ From Australia’s IER submission.

²⁷⁴ Canada Justice Laws, ‘Canadian Gender Budgeting Act’, 20 June 2019, <https://laws-lois.justice.gc.ca/eng/acts/C-17.2/page-1.html>.

²⁷⁵ Government of Canada, ‘Introduction to GBA+’, Status of Women Canada, modified 26 September 2018, https://cfc-swc.gc.ca/gba-acsc/course-cours/eng/modA1/modA1_01_05.html#pop-11.

and young women in the celebration events held by UN agencies, governments and the private sector.²⁷⁶ UN Women has established an online learning platform called WeLearn to provide courses in areas such as fundamental digital skills, financial literacy and business development.²⁷⁷

In APEC, the Policy Partnership on Women and the Economy forum has established an APEC Women and Economy Sub-fund in 2018 to support projects focused on improving economic opportunities for women in the region. Ongoing initiatives include the APEC Women in STEM Initiative, which aims to increase women's participation in STEM education and careers; the Women Entrepreneurship in APEC Initiative, which supports capacity-building activities for women entrepreneurs; and the Women's Micro-Enterprise Trade Network Project, which connects local women-owned MSMEs with the global market.²⁷⁸

D. Optimising structural reforms – developing holistic policy frameworks

Structural reforms are important to maximise the benefits and economic opportunities brought about by the digital economy while overcoming challenges and avoiding harms. However, structural reforms need to be optimised to ensure their continued relevance. Prior to embarking on new structural reform efforts, it is crucial for economies to establish a baseline and identify their plans moving forward. Economies may wish to conduct a stocktake of their policies to identify those relevant to the digital economy and better understand the gaps and challenges. They will also need to recognise that implementing structural reforms is not a one-off activity but rather a process. They need to ensure that policies and regulations are regularly reviewed and updated, particularly in light of the ever-shifting challenges posed by the digital economy.

For the digital economy to work seamlessly, there are several aspects to be tackled. When implementing policies, policymakers need to ensure they are well-coordinated, coherent and complementary to one another. In other words, it is important for economies to approach policy issues and objectives in a holistic rather than in a piecemeal manner. As indicated in *Structural Reforms for Inclusive Growth: Three Approaches*, this would entail getting the basics right by focusing on core structural reforms, and complementing them with supplementary structural reforms and supporting policies. Otherwise, there are risks that policies in one area would have inadvertent negative impacts on another. Lack of coordination can also lead to missed opportunities regarding possible synergies with other structural reforms and supporting policies that would increase the likelihood of attaining policy objectives. This requires policymakers to reach across traditional policy silos as well as across different ministries and levels of government to develop an integrated, whole-of-government approach to policymaking.

Enhance labour market efficiency

If the policy objective is to assist workers with adjusting to the economic and technological shifts brought by the digital economy, economies have to first ensure that their labour markets are functioning well through core structural reforms to tackle issues such as hiring and firing practices, cooperation in labour-employer relations and flexibility in wage determination. Considering that the digital economy is likely to destroy jobs and disrupt entire sectors even as it creates new job opportunities, economies would also need to put in place active labour market policies (ALMPs). A well-coordinated ALMP would gather, analyse and make available accurate and timely labour market information, both from the supply-side as well as the demand-side. Concurrently, economies would need to develop skills definitions and certification mechanisms to recognise skills obtained outside formal channels.

²⁷⁶ ITU, 'Girls in ICT Portal', 2019, <https://www.itu.int/en/ITU-D/Digital-Inclusion/Women-and-Girls/Girls-in-ICT-Portal/Pages/Portal.aspx>.

²⁷⁷ United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), 'Virtual Skills School' (brochure, UN Women, 2017), <https://www.unwomen.org/en/digital-library/publications/2017/3/un-women-virtual-skills-school-brochure>.

²⁷⁸ Emmanuel A. San Andres et al., 'APEC Regional Trends Analysis: Trade, Policy, and the Pursuit of Inclusion' (Singapore: APEC, May 2018), <https://www.apec.org/Publications/2018/05/APEC-Regional-Trends-Analysis>.

Tackle the rural-urban divide

Similarly, if the policy objective is ensure that people in rural and remote communities benefit from the digital economy, enhancing competition policies and regulations (per Approach I) to give existing and new telecommunications providers incentives to improve their service offerings, while a good first step, would not be sufficient. Supporting policies (per Approach II) including incentives (e.g., grants, tax breaks) and in some cases mandates that private firms extend services to underserved areas would have to be put in place as well.

Improve MSME participation

Likewise, if the policy objective is to empower more MSMEs to participate in the digital economy, even as economies continue to simplify their EoDB procedures such as starting a business and accessing credit (per Approach I), they also need to put in place more targeted policies beyond core structural reforms (per Approach III). These include training and mentorship programmes and grants to facilitate technology adoption by MSMEs. As economies put in place a whole-of government effort to update regulations to meet the challenges of the digital economy, they should ensure that the policy process takes into account the particular needs of MSMEs as a cross-cutting issue.

Empower women economically

If the policy objective is to increase gender inclusion in the digital economy, economies need to explore and implement a full range of policy options which encompasses both core and supplementary structural reforms and supporting policies. Starting with core structural reforms, economies would have to ensure that competition policies and regulations are reformed in such a way that they create an enabling environment for businesses and investors (including venture capitalists) to operate. At the same time, there is a need for regulations and reforms in areas such as childcare and maternity leave to encourage women's participation in entrepreneurship and the labour force. Last but not least, supporting policies have to be implemented to counter the stereotypes associated with the digital economy and hence enhance the attractiveness of digital-related sectors to women. These include introducing STEM education for women, enhancing outreach activities to showcase women in high-tech jobs and promoting voluntary reporting of hiring by gender, among others.

While policies may be well-intended and well-targeted, achieving the desired outcome is not a given and could be affected by issues such as delivery mechanisms and resource availability. Communication is key to ensure that all stakeholders understand how proposed policies and regulations will affect them and that they can access relevant information. To ensure responsiveness, economies would need to build monitoring and evaluation (M&E) activities into the policymaking process. This is particularly so in the context of the digital economy whose rapid evolution can make even recent policies obsolete very quickly. A mix of specific and broad indicators would be useful, particularly given the challenges of measuring the digital economy outlined in Section B of Part 1 and elaborated in Annex A, as the different types of indicators can complement one another. Specific indicators will allow for better tracking of a particular policy objective, while broad indicators will allow for its economy-wide implications to be monitored. In the absence of ex post evaluation of the effectiveness of policies designed for the digital economy, it would be difficult for APEC economies to track progress and determine how policies and regulations can be enhanced and kept relevant.

PART 4: SUMMARY OF KEY POINTS FROM INDIVIDUAL ECONOMY REPORTS AND MAJOR APEC INITIATIVES RELATED TO THE DIGITAL ECONOMY

A. Highlights from Individual Economy Reports

Individual Economy Reports (IERs) are an integral component of the APEC Economic Policy Report (AEPR). The questionnaires provide first-hand insights from APEC economies relating to various aspects of the focus issue. Specifically on the digital economy, all 21 economies have submitted their IERs, providing valuable information in areas such as barriers and challenges; policy gaps; best practices; and action plans. Economies also shared information on their efforts to enhance inclusion in the new economy and their perspectives on how regional cooperation fora such as APEC can facilitate their efforts in maximising opportunities while overcoming the challenges presented by the digital economy. This section provides highlights from the IERs and a summary of the efforts taken by APEC economies to address challenges in the digital economy.²⁷⁹

Barriers and challenges

Several economies including Brunei Darussalam; China; Indonesia; Mexico; the Philippines; Singapore; Chinese Taipei; the United States; and Viet Nam noted the challenges in scoping and measuring the digital economy. The difficulty in accurately measuring the digital economy makes it harder for policymakers to prioritise projects, assess the costs and benefits of regulatory interventions, and communicate the benefits of the digital economy to the general public.

In the category of regulatory and legal frameworks, several economies including Australia; Canada; Chile; Hong Kong, China; Indonesia; Korea; Malaysia; Mexico; and the Philippines opined that balancing policies to achieve various objectives have become more challenging given the rapid evolution of the digital economy. On the one hand, there is a need to ensure that regulations are flexible, agile and adaptable to the changing market conditions so as to encourage innovation and the development of new business models. On the other, there is a need to ensure predictability of regulations, the integrity and stability of sectors, and that consumers are protected. Economies also noted the inconsistency of regulations across jurisdictions, the difficulty in classifying disruptive technologies into the remit of specific regulatory departments since they are often cross-sectoral in nature, and the lack of coordination among agencies.

On competition policy, economies noted the challenges in ensuring that the relevant authority strikes a balance between law enforcement and unnecessary intervention. Competition law enforcement and investigations have also become more challenging. For example, Chinese Taipei indicated that, due to the difficulty of obtaining certain kinds of business data relevant to the digital economy, it is challenging to evaluate firms' market power. Moreover, Japan noted that coordination of competition policy in the digital economy requires high-level expert knowledge and overcoming vertical divisions among ministries and agencies in order to facilitate timely responses amidst accelerating changes.

With regard to public sector governance, while economies acknowledged the need to build public trust and confidence in the governments' use of data, they observed that barriers such as the lack of regulations, privacy considerations and security risks may inhibit the ability of government agencies to share and realise the full potential of public sector data. Furthermore, economies noted the challenges in getting their public sector to adopt new technologies and tools.

Other challenges raised by economies relate to infrastructure availability and affordability; and low uptake of digital technology and tools by some segments of their society including firms.

²⁷⁹ Please refer to Annex B for the full Individual Economy Reports (IERs) submitted by economies.

Policy gaps

Amid the wide range of barriers and challenges, it is crucial that economies identify specific policy gaps to ensure more targeted efforts. Some indicated the need to focus efforts toward scoping and measuring the digital economy so that policymakers can have baseline data and can better understand the need and value of regulatory intervention.

Several economies including China; Chile; Indonesia; Korea; Malaysia; New Zealand; Papua New Guinea; the Philippines; Chinese Taipei; and Thailand identified that an important gap to address would be the lack of regulatory frameworks to support new business models and encourage the growth of digital economy firms. They seek a better understanding of how existing regulatory frameworks could limit the potential of the digital economy and how they could be improved. For example, Chile has identified policy gaps on the regulation and supervision of various alternative financial services and the transaction of securities and other virtual assets. The importance of overcoming the silo approach to policymaking through collaboration among different government agencies was also noted.

In addition, economies acknowledged the importance of improving trust in the digital economy and indicated that one way to do so would be to enhance regulations pertaining to digital identity. For example, Australia's Digital Transformation Agency with its Trusted Digital Identity Framework emphasised the need to better identify various online users (e.g., businesses, individuals and government agencies) to ensure users feel they are engaging in low-risk and transparent interactions with actual service providers.

Economies also noted the importance of enhancing public communication on the benefits and risks of digital transactions. Other gaps noted by economies include public sector digitisation, digital skills, and access to personal data held by governments and businesses.

Finally, some economies flagged the importance of addressing gaps pertaining to international cooperation on digital rules and standards. For example, there is a need to develop policy frameworks and international standards for the digital economy that enhance certainty for digital firms operating across borders, reduce entry barriers and create a supportive investment environment. Economies also noted the importance of ensuring alignment in areas such as data protection and cyber security.

Best practices

Improving metrics and undertaking structural reform can play an important role in enabling economies to overcome the challenges and policy gaps associated with the digital economy. To better scope and measure the digital economy, Chile's Ministry of Economy is currently surveying firms to obtain data on e-commerce, the digital economy and key ICT indicators. The United States' Bureau of Economic Analysis (BEA) is in the midst of developing tools to better measure high-tech goods and services and the digital economy's contribution to GDP as well as to provide a more complete picture of international trade.

With regards to legal and regulatory frameworks, economies have either undertaken or are in the midst of regulatory updates in areas such as cybersecurity, online identity management and data use. To coordinate efforts pertaining to the digital economy, Thailand has established the Ministry of Digital Economy and Society. Its role is to plan, promote, develop and implement activities related to a digital society and economy. To improve data availability and use, Australia, for example, announced a suite of reforms aimed at balancing privacy and security concerns with the benefits of sharing and using data more efficiently. These include: (1) establishing an Office of the National Data Commissioner (ONDC) and appointing an Interim National Data Commissioner; (2) developing a Consumer Data Right to give citizens greater data portability; and (3) developing legislation on Data Sharing and Release legislation to improve sharing, use and re-use of public sector data. Hong Kong, China announced a new open data policy that requires all government departments to release data in machine-readable formats for free

public use via the Public Sector Information (“PSI”) portal (data.gov.hk), subject to any justifiable policy, legal and/or operational reasons for not doing so. To enhance cybersecurity in a connected world, Mexico presented a National Cybersecurity Strategy in November 2017. This led to the cybersecurity provisions in the legal framework for banking institutions being modified to guarantee the protection of personal data. On online identity management, Russia has introduced the Unified System of Identification and Authentication and the Unified State Automated Information System. To better regulate e-commerce, China introduced the E-Commerce Law which came into force in January 2019. The law covers various aspects, including registration of legal entities, responsibility of platform, prohibition of false advertising, protection of intellectual property rights (IPR) and taxation.

On the competition policy front, Chinese Taipei’s Fair Trade Commission (FTC) has become more active, assessing 13 mergers of the digital economy’s firms and prohibiting 10 of them in the past five years. Mexico published the Federal Telecommunications and Broadcasting Law to regulate the use, development and operation of the radio spectrum and public telecommunications network and access to various components such as infrastructure and satellites.

In their efforts to improve the ease of doing business, Australia and New Zealand signed an e-invoicing arrangement to create and maintain a common approach based on the open Pan-European Public Procurement On-Line (PEPPOL) interoperability framework and standards employed widely in Europe since 2012 and in Singapore since January 2019 as an enabler for e-invoicing and wider e-procurement. The Philippines has introduced SEC-iView, an online pay-per-use facility that allows users to obtain copies of documents from companies registered with the Securities and Exchange Commission (SEC). Through the ‘your business in a day’ regulations, Chile has created an electronic registry that allows people to set up, modify, transform, merge and dissolve legal entities. It is administered by the Ministry of Economy, Development and Tourism. Indonesia has simplified business licensing processes through Government Regulation no. 24/2018, which allows a single electronic submission for all types of business licenses. Brunei’s BusinessBN aims to provide businesses with essential information on government services and reforms related to doing business, while OneBiz serves as a one-stop online portal to facilitate the starting up of businesses. Similarly, business registrations in Papua New Guinea can now be done online with a turnaround time of less than a day. Malaysia launched the Digital Free Trade Zone (DFTZ) to facilitate seamless cross-border e-commerce trade by connecting businesses and various services providers through an e-services platform (to manage cargo clearance and other processes needed for cross-border trade). China’s joint customs, immigration and maritime inspection has reduced the customs clearance time for export and import in 2018 by 61.2 and 56.4 percent respectively compared to 2017.

On public sector governance, Hong Kong, China established a Smart Government Innovation Lab in 2019 to facilitate the adoption of IT solutions and products to enhance public services delivery. Brunei Darussalam’s E-Government National Centre (EGNC) serves as the centralised organisation overseeing the development of IT personnel, procurement of IT equipment and providing common government-wide applications and shared IT services to all ministries. Since 2013, the Korean government has promoted administrative innovation to integrate government services and eliminate silos among ministries, in order to provide proactive and customised services to the citizens and facilitate the disclosure of government data. In the Philippines, the e-Government Master Plan led by the Department of Information and Communication Technology aims to improve government services through a wider e-government presence and reduction of bureaucratic red tape (e.g., payroll through mobile-based e-money or e-banking; and digital payments by the general public, specifically to local government units and non-government organisations). In 2015, Viet Nam adopted Resolution 36a/NQ-CP on e-government to promote the use of IT in public services provision. In line with its Digital Economy programme, Russia has implemented a federal project aimed at the digital transformation of state/municipal services through the ‘gosuslugi.ru’ website, which has proven effective at processing various public services. Peru’s GOB.PE platform aims to allow its citizens to access various public services within a single location, while the PAGALO.PE platform simplifies fee payment to different public entities.

To overcome the silo approach to policymaking, Brunei Darussalam has set up the Digital Economy Council (DEC) under the co-chairmanship of the Minister in the Prime Minister's Office and the Second Minister of Finance and Economy with the Minister of Transport and Infocommunications to give strategic leadership on initiatives for the digital economy at the economy level. Peru has established the High Level Committee for a Digital, Innovative and Competitive Peru chaired by the President of Peru and the Presidency of the Council of Ministers. The committee guides, directs, supervises and evaluates the development of the digital economy and government.

One sector that has benefited from such structural reform efforts is the financial sector. On the payments front, Australia developed the New Payments Platform (NPP) in February 2018 to enable households, businesses and government agencies to make near real-time funds available to recipients on a 24/7 basis. Papua New Guinea's Kina Automated Transfer System (KATS) led to a reduction in payment clearance from about four days to two days. The Philippines established the National Retail Payment System Framework in 2017 to facilitate more convenient, affordable and secure electronic fund transfers and payments, and aims to increase electronic retail payments from 1 percent in 2013 to 20 percent by 2020.

To enhance the regulation of new business models in the financial sector including fintech, Chinese Taipei's Financial Services Commission (FSC) revised regulations relating to requirements for the establishment of internet-only banks in April 2018. The Securities Commission Malaysia has adopted a facilitative approach to regulating equity crowdfunding, peer-to-peer financing and digital investment management activities, where regulation is imposed on a graduated scale depending on market growth and product complexity. Peru's Securities Market Superintendent (SMV), Central Reserve Bank, Superintendency of Bank and Insurance, and Ministry of Economy and Finance are working on a draft law to regulate financial crowdfunding activities and to consider implementing a regulatory sandbox to develop such activities. Mexico's National Banking and Securities Commission (CNBV) is working to develop and implement a supotech platform to receive regulatory reports from authorised fintech firms and to obtain data from commercial banks related to anti-money laundering and combating the financing of terrorism (AML/CFT) efforts. In 2019, New Zealand overhauled the regulation of financial advice by repealing and replacing the Financial Advisers Act 2008 and amending the Financial Service Providers Act 2008 to remove regulatory barriers that had prevented the provision of some types of financial advice including online or robo advice. Canada has made legislative amendments to enable federally-regulated financial institutions to invest in firms that blend financial and commercial services.

To promote technology adoption and innovation in the financial sector, Hong Kong, China set up the FinTech Facilitation Office under the Hong Kong Monetary Authority to improve the fintech ecosystem in the city. The office acts as a platform to exchange ideas, an interface between market participants and regulators, an initiator of industry research regarding the potential application and risks of fintech solutions and a facilitator to nurture talents to create a pipeline for the economy's growing fintech needs. Similarly, Japan's Financial Services Agency (FSA) has established the FinTech Innovation Hub to serve as a platform for interactions with fintech firms so as to better understand and make use of the insights to create a better environment for such firms to thrive. Chile's Central Bank has created a Tech Observatory to detect the opportunities and potential impacts of new technologies in the financial sector and other areas. The United States Commodity Futures Trading Commission (CFTC) has established LabCFTC to promote responsible fintech innovation and fair competition for public benefit. Thailand's Central Bank, the Office of Insurance Commission and the Securities and Exchange Commission have put in place regulatory sandboxes to promote innovation in the financial sector. The Bank of Russia established a regulatory sandbox for fintech projects in April 2018 and is considering the introduction of a special licensing regime for new market participants to test their service on real customers for a set period of time. The Philippines' Central Bank, Bangko Sentral ng Pilipinas (BSP) is in the final stages of the pilot implementation of an Application Programming Interface (API) system to automate the collection, processing and analysis of data from BSP-supervised financial institutions.

Action plans

Many APEC economies have recently launched or are in the midst of implementing economy-wide strategies related to the digital economy. Australia launched its Digital Economy Strategy in December 2018 setting out a seven-year vision (2018-2025) on how businesses, governments and local communities can work together to maximise the benefits and opportunities enabled by digital technology. In Russia, the “Digital Economy of the Russian Federation” programme is in force until 2024 and focuses on normative regulation in the digital environment, information infrastructure, personnel, information security, digital technologies and digital public administration. In May 2018, Singapore’s Ministry of Communication and Information, in collaboration with the Infocomm Media Development Authority of Singapore launched the Digital Economy Framework for Action to build Singapore’s competitive edge in the digital era through promoting collaboration and building a vibrant ecosystem. The Philippines’ E-Commerce Roadmap 2016-2020 aims to increase the contribution of e-commerce to 25 percent of its GDP by 2020. It is currently updating the roadmap and plans to launch the Philippine E-Commerce Roadmap 2020-2022 before the end of 2019. Thailand’s Digital Economy and Society Development Plan (2018-2037) aims to drive the economy and build an equitable and inclusive society through digital technology.

On the competition policy front, Chinese Taipei’s Fair Trade Commission has formed the Digital Economy and Competition Policy Task Force in April 2017 to collect and study relevant literature and to observe trends in competition enforcement globally. In the same vein, Japan has made plans to establish the Digital Markets Competition Headquarters to better promote competition, improve the environment for digital firms and provide recommendations to further develop the digital market.

Chile has launched its Digital Agenda 2020, a roadmap whose goal is to reduce inequality through the widespread use of technologies, and by creating more and better opportunities. In November 2018, Korea has introduced a comprehensive strategy called ICT for ALL aimed at building ‘a human-centred intelligent information society for all’. Hong Kong, China has a Smart City Blueprint for Hong Kong that covers 76 initiatives, including launch of the Faster Payment System as well as the provision of Electronic Identity (eID) for free to all residents.. Bank Indonesia’s Payments System Blueprint 2025 aims to support the development of a supportive ecosystem such as implementation of an open API standard and facilitation of digital technology deployment to promote digital transformation within the banking industry, while ensuring monetary and financial system stability. Malaysia has launched the National eCommerce Strategic Roadmap and the National Policy on Industry 4.0 (Industry4WRD) to enhance the e-commerce ecosystem and drive digital transformation in the manufacturing and services sectors, respectively.

Inclusion

APEC economies are making efforts to minimise gaps and ensure that the domestic digital divide does not prevent them from benefiting from the opportunities presented by the digital economy. According to *Structural Reforms for Inclusive Growth: Three Approaches* (hereafter referred to as *Three Approaches*), an EC document endorsed at the High-Level Structural Reform Officials Meeting (HLSROM) in 2018, one strategy for promoting inclusive growth is to focus structural reform efforts in areas that have strong pro-inclusion externalities. These include infrastructure, human capital development and efforts to promote financial inclusion (see Part 3 for more details).

Infrastructure. Australia has committed to delivering high-speed broadband to all homes and businesses over the National Broadband Network (NBN) by mid-2020, including to regional and remote areas that have traditionally had poor broadband availability. Chinese Taipei is continuing with its free public wifi deployment so that people in remote areas are able to access the internet. In addition, internet service providers (ISPs) are required to reduce access fees gradually. Indonesia’s Palapa Ring project, which aims to enhance telecommunications and communication networks across the archipelago, has been completed for the western and central parts of the economy. New Zealand has undertaken an Ultra-

Fast Broadband (UFB) programme which is expected to enable 87 percent of its population spread over 390 towns and cities to access fibre broadband by the end of 2022. Canada's Connect to Innovate program is helping to build high-capacity internet connection in more than 900 rural and remote communities. The Philippines' National Broadband Plan aims to improve overall internet speed and service availability and affordability across the economy particularly in remote areas through the deployment of fibre optics and wireless technologies. The United States has several initiatives including the American Broadband Initiative, the BroadbandUSA Program and the United States Department of Agriculture (USDA) ReConnect Program whose objectives include expanding broadband coverage across the economy. Malaysia has set a target that fixed broadband cost should not be more than 1 percent of gross national income per capita, and it has managed to reduce fixed broadband cost by more than 40 percent through common infrastructure sharing and greater transparency in wholesale level pricing. Japan aims to extend 5G-related services to all prefectures by 2020 by providing necessary assistance for the development of ICT infrastructure such as 5G base stations and optical fibres. Furthermore, it plans to deploy artificial technologies through the use of geospatial information. China notes that its basic telecommunication companies are required to provide universal telecommunication services and to ensure that network rates in poor areas are not higher than the average rates of the surrounding areas. In addition, it has facilitated faster and more affordable internet connections to schools, especially those in rural areas. China's Ministry of Education is currently coordinating with basic telecommunication firms to connect the approximately 30,000 schools that have yet to be connected to the internet. It also plans to provide broadband network to 24,085 schools by 2020.

Skills. To overcome skills shortages in the digital age, New Zealand has established the Future of Work Tripartite Forum which brings together government, business and unions to improve the use of technology, create more productive workplaces and improve the skills of its workers. Furthermore in 2016, New Zealand's Ministry of Education undertook a review of the positioning and content of digital technologies within the New Zealand Curriculum and Te Marautanga o Aotearoa, which led to digital technologies becoming more prominent in the curriculum. Canada has introduced programs such as #PromoScience to support hands-on learning experiences for young students and their teachers to promote understanding of science and engineering (including mathematics and technology). The Youth Employment and Skills Strategy (YESS) has been modernised and will focus on providing support to youth, particularly those facing barriers to employment, to gain essential skills including digital skills and work experience.

Women's economic empowerment. Since 2016, in response to the gender barriers in the digital world, Australia has invested significantly in boosting the participation of girls and women in STEM education and careers. Examples include: (1) 'Girls in STEM' Toolkit to help school-age girls to understand what a STEM career may entail and assist them in matching their interests to a STEM career; and (2) SheStarts to help women to build tech start-ups. Statistics Canada publishes on a regular basis a gender-based statistical report which provides an overview of women and education, including their integration into STEM fields and their entry into and exit from the field. Tracking such metrics is critical in supporting greater gender inclusion in the digital economy.

Specifically on promoting entrepreneurship in the digital age, Malaysia has introduced digital entrepreneurship programmes such as eUsahawan and eRezeki, whose objectives encompass providing training and matching digital tasks to relevant individuals particularly those from lower income groups so as to enable them to take advantage of potential business opportunities created by the sharing/gig economy.

To ensure that the disadvantaged and the elderly are able to access government subsidies and other services in the absence of computer and internet access, civil servants in Chinese Taipei visit their homes and serve them using tablet PCs. Hong Kong, China started the ICT Outreach Programme in 2014 for the Elderly to help institutionalised and "hidden" (i.e., socially isolated) elderly and those who receive day or home care services experience how ICT can promote active and healthy ageing. Activities such as programmes on using smart bracelets for health monitoring, virtual reality games for reminiscence therapy, intelligent robots and brain-training interactive games to help slow down the

deterioration of elderly people with dementia. There is also an ICT Training Programme for the Elderly where senior citizens are equipped with basic ICT knowledge so that they can serve as trainers for their peers. With regard to efforts to promote rural inclusion in the digital economy, Korea is operating information villages in rural and mountainous areas that take part in e-commerce (InVil Shopping), providing local delicacies and tour programmes to consumers from larger cities.

Financial inclusion. The Bank of Russia approved the Financial Inclusion Strategy for Russia 2018-2020 to improve the accessibility and quality of financial services available to consumers in remote or inaccessible areas, as well as MSMEs and other groups with limited access to financial services. Through its Federal Telecommunications Institute (IFT), Mexico is currently implementing the Financial Inclusion Global Initiative (FIGI) to accelerate the implementation of reform actions so as to meet the economy's financial inclusion targets. Papua New Guinea's Financial Inclusion Policy and Strategy aims to ensure that all residents are financially competent and able to access a wide range of financial services. Thailand has introduced the Basic Banking Account (BBA) to improve access to financial services for low-income earners. Bank Indonesia has put in place initiatives such as non-cash social assistance programmes (i.e., transfers to bank account), which in addition to enhancing efficiency and security, promotes financial literacy among recipients as it encourages them to learn how to access financial services.

Regional cooperation

Economies noted the value of regional cooperation such as APEC in responding to the shared challenges of the digital economy. They stressed the importance of APEC's role in facilitating discussion and knowledge sharing on best practices and innovative regulatory approaches to emerging technologies and business models. Dialogues, workshops and other capacity-building activities involving academia, the private sector and other international organisations can also contribute to enhancing collaboration in areas such as competition enforcement.

To improve measurement of the digital economy, APEC can consider taking actions to: (1) develop common definitions, measurement approaches and standards across the region; (2) develop an approach to collecting data in the digital economy that includes services, productivity and inclusion; and (3) strengthen the capacity of statistical agencies to measure the digital economy through best practice and experience sharing.

In the areas of structural reform, APEC can encourage: (1) the development of approaches such as regulatory sandboxes and innovation hubs that support firms in employing new business models; (2) continued improvements in the business regulatory environment; (3) the development of knowledge repositories and the production of guidebooks on digital economy-related topics to serve as additional reference materials; and (4) the facilitation of greater public and private sector data sharing including experience sharing on how to improve public trust on data usage by government and the private sector.

B. Major APEC initiatives on the digital economy

As early as two decades ago, APEC had recognised the importance of the digital economy including e-commerce in linking member economies. Through its 1998 Declaration, APEC Leaders commended the **APEC Blueprint for Action on Electronic Commerce** which sets out principles for promoting and developing e-commerce in the region.²⁸⁰ In 1999, the Electronic Commerce Steering Group (ECSG) was established as an APEC Senior Official's Special Task Force before it was aligned with the Committee on Trade and Investment (CTI) to ensure a stronger focus on trade and investment issues. Besides coordinating e-commerce activities based on the principles identified in the blueprint, the ECSG works to promote the development and use of e-commerce by supporting the creation of legal, regulatory and policy environments in the APEC region that are predictable, transparent and consistent.

²⁸⁰ APEC, '1998 Leaders' Declaration' (Singapore: APEC, 1998), https://www.apec.org/Meeting-Papers/Leaders-Declarations/1998/1998_aelm.

In 2014, APEC Leaders endorsed the **APEC Initiative of Cooperation to Promote Internet Economy** and established the Ad-hoc Steering Group on Internet Economy (AHSGIE) to guide the discussion on issues arising in this area.²⁸¹ In 2017 APEC Leaders welcomed the **APEC Internet and Digital Economy Roadmap (AIDER)**²⁸² that had been developed by AHSGIE. The roadmap is a living document designed to promote the development and growth of the internet and the digital economy in the region and to highlight potential areas of cooperation among APEC fora. Economies will concentrate, but not limit, their work to the following 11 focus areas: (1) development of digital infrastructure; (2) promotion of interoperability; (3) achievement of universal broadband access; (4) development of holistic government policy frameworks for the internet and the digital economy; (5) promoting coherence and cooperation of regulatory approaches affecting the internet and the digital economy; (6) promoting innovation and adoption of enabling technologies and services; (7) enhancing trust and security in the use of ICTs; (8) facilitating the free flow of information and data for the development of the internet and the digital economy, while respecting applicable domestic laws and regulations; (9) improvement of baseline internet and the digital economy measurements; (10) enhancing the inclusiveness of the internet and the digital economy; and (11) facilitation of e-commerce and advancing cooperation on digital trade.

The **APEC Framework on Cross-border E-commerce Facilitation**, endorsed in 2017 has five main objectives: (1) create a favourable regulatory ecosystem for e-commerce to promote predictability, transparency, security, fair competition and consistency; (2) promote the development of ICT infrastructure to facilitate cross-border e-commerce; (3) encourage and facilitate greater participation of businesses in global commerce, in particular MSMEs; (4) enhance cooperation between the public and private sectors, including on consumer protection; and (5) contribute to trade and investment facilitation in the region, and support the achievement of the Bogor Goals and post-2020 vision.

Five working pillars were identified to achieve these objectives. They are: (1) promoting transparent and predictable legal and regulatory approaches and measures that are business-friendly and coherent to facilitate cross-border e-commerce in the region; (2) enhancing capacity building so that APEC economies can assist MSMEs to increase their cross-border e-commerce participation in global and regional markets; (3) strengthening cross-border data privacy protection through increased implementation of existing APEC programs; (4) facilitating cross-border paperless trade in the region; and (5) addressing emerging and cross-cutting issues in cross border e-commerce. Specific activities were placed under each of the pillars to encourage action and monitor progress.²⁸³

Furthermore, in 2018, the **APEC Action Agenda for the Digital Economy** commits economies to prepare a comprehensive work programme on future implementation with contributions from committees and sub-fora as well as to develop further the digital economy-related work areas.²⁸⁴ Additionally, it aims to develop a programme for future data and analytical support for APEC work under the roadmap. The action agenda also welcomed the establishment of the **Digital Economy Steering Group (DESG)**, a new governance mechanism that monitors and reports the progress made within focus areas identified in AIDER to Senior Officials. The DESG was established by restructuring the former ECSG and will carry forward the ECSG's existing work program.²⁸⁵

²⁸¹ APEC, '2014 Leaders' Declaration' (Singapore: APEC, 2014), https://www.apec.org/Meeting-Papers/Leaders-Declarations/2014/2014_aelm.

²⁸² APEC, 'APEC Internet and Digital Economy Roadmap' (2017/CSOM/006, Singapore: APEC, 2017), https://www.apec.org/-/media/Files/Groups/ECSG/17_csom_006.pdf.

²⁸³ APEC, 'Annex A: APEC Cross-Border E-Commerce Facilitation Framework' (Singapore: APEC, 2017), https://www.apec.org/Meeting-Papers/Annual-Ministerial-Meetings/2017/2017_amm/Annex-A.

²⁸⁴ APEC, *APEC Economic Policy Report 2018*.

²⁸⁵ APEC, 'Terms of Reference of the APEC Digital Economy Steering Group (Endorsed)' (Singapore: APEC, 2019), http://mddb.apec.org/Documents/2019/SOM/SOM3/19_som3_022.pdf

As seen in the previous sections, maximising opportunities provided by the digital economy while overcoming its challenges requires work to be undertaken in specific key areas. In the area of infrastructure, for example, the **APEC Connectivity Blueprint** was formulated with the aim of ensuring a ‘seamless and comprehensively connected and integrated Asia-Pacific’. Digital connectivity falls under the blueprint’s physical pillar, specifically the area of ICT infrastructure.²⁸⁶ In its efforts to promote infrastructure development, the Finance Ministers’ Process (FMP) has created a **Collaborative Action Plan between APEC Member Economies and the Global Infrastructure Hub (GIH)**. The action plan aims to create a voluntary, non-binding and non-exclusive framework to facilitate cooperation and collaboration on regional infrastructure.²⁸⁷

The **APEC Services Competitiveness Roadmap (ASCR)**, which commits members to steps to facilitate the trade and investment of services and to enhance the competitiveness of the sector. Specifically, one of its APEC-wide actions calls for collaboration in response to the rapid developments in internet-based technology.²⁸⁸ This is expected to promote a regulatory approach that provides appropriate prudential oversight and addresses consumer and security protection concerns while enabling the flow of trade-related data in an increasingly digitalised world.

With regard to trade facilitation, the **APEC Supply-Chain Connectivity Framework Action Plan Phase II** was initiated to increase the competitiveness of businesses in the region by reducing the cost of trading across borders and improving the reliability of the supply chain. The action plan identifies five chokepoints. Improving the policy and regulatory infrastructure for e-commerce falls under Chokepoint 5. Additionally, initiatives proposed in response to other chokepoints have called for the application of digital technologies and tools. For instance, Chokepoint 1, which tackles the lack of coordination between border management and underdeveloped border clearance and procedures, has identified single window systems and global data standards as possible solutions.²⁸⁹

The **APEC Privacy Framework** provides guidance and direction to businesses and government entities on common privacy issues.²⁹⁰ The framework was updated in 2015 to reflect major shifts in business operations and consumer expectations because of technology advancements and the nature of information flows.²⁹¹

Building on the Privacy Framework, the **APEC Cross Border Privacy Rules (CBPR)** system seeks to balance the flow of information and data across borders with the need for effective protection of personal information. It is a voluntary certification scheme allowing companies to transfer personal data (inter and intra company) across APEC participants. There were eight APEC economies participating in the CBPR system in 2019: Australia; Canada; Japan; Korea; Mexico; Singapore; Chinese Taipei; and the United States.²⁹²

²⁸⁶ APEC, ‘APEC Connectivity Blueprint’ (Singapore: APEC, January 2015), https://www.apec.org/-/media/APEC/Publications/2015/1/APEC-Connectivity-Blueprint/APEC-Connectivity-Blueprint-2014_22012015.pdf.

²⁸⁷ APEC, ‘Annex C: Collaboration Action Plan between APEC Member Economies and the Global Infrastructure Hub’ (Singapore: APEC, 2016), https://www.mof.go.jp/english/international_policy/convention/apec/20161015_3.pdf.

²⁸⁸ APEC, ‘APEC Services Competitiveness Roadmap Implementation Plan (2016–2025)’ (28th APEC Ministerial Meeting, Lima, Peru, 17–18 November 2016), http://mddb.apec.org/Documents/2016/MM/AMM/16_amm_012.pdf.

²⁸⁹ APEC, ‘2018 Stocktake: The APEC Supply-Chain Connectivity Framework Action Plan (SCFAP) II 2017–2020’ (Singapore: APEC, 2018), <https://www.apec.org/-/media/APEC/Publications/2018/11/2018-CTI-Report-to-Ministers/TOC/Appendix-7---Stocktake-of-APEC-Initiatives-for-SCFAP-II.pdf>.

²⁹⁰ APEC, ‘APEC Privacy Framework’ (Singapore: APEC, December 2005), <http://publications.apec.org/Publications/2005/12/APEC-Privacy-Framework>.

²⁹¹ APEC, ‘Updates to the APEC Privacy Framework’ (2016/CSOM/012app17, Singapore: APEC, 2016), http://mddb.apec.org/Documents/2016/SOM/CSOM/16_csom_012app17.pdf.

²⁹² APEC, ‘Cross Border Privacy Rules System’, CBPRs, accessed 19 September 2019, <http://cbprs.org/>.

The CBPR is further complemented by the **Privacy Recognition for Processes (PRP)** system²⁹³ and the **APEC Cross-border Privacy Enforcement Arrangement (CPEA)**.²⁹⁴ The former is a system designed to help personal information processors assist controllers in complying with relevant privacy obligations and identify qualified and accountable processors. The latter is a multilateral arrangement providing the first APEC mechanism for privacy enforcement authorities to voluntarily share information and provide assistance for cross-border data privacy enforcement. APEC is also exploring the possibility of achieving interoperability between CBPR and the European Union General Data Protection Regulation (EU GDPR).²⁹⁵

APEC is in the midst of developing the **APEC Collaborative Framework for Online Dispute Resolution (ODR) of Cross-Border Business-to-Business (B2B) Disputes** to help businesses including MSMEs resolve B2B cross-border disputes.²⁹⁶ Many MSMEs are reluctant to engage in international trade out of fear of the high costs of litigation in case of a dispute. Current arbitration systems are also too costly and time-consuming, hence inappropriate for small value disputes. This project is an example of harnessing digital tools to help MSMEs access global opportunities, thereby promoting inclusion.

On the human capital development front, the **APEC Framework on Human Resources Development in the Digital Age** proposes a set of policy directions and measures to help economies ensure citizens are better prepared to deal with the challenges of the working world today.²⁹⁷ Additionally, the **APEC Education Strategy** has been implemented by the Human Resources Development Working Group (HRDWG) to guide its projects and initiatives. One of the objectives of the strategy is to improve the use of education and technological capabilities in learning through better use of ICT.²⁹⁸ In 2012, the APEC Finance Ministers released a policy statement on the importance of financial literacy and education.²⁹⁹ Subsequently, they introduced the **Cebu Action Plan (CAP)** to serve as a voluntary roadmap to increase prosperity, financial integration, transparency, resilience and connectedness. Under the CAP, APEC has organised activities such as the Workshop on Improving Digital Finance Literacy in APEC³⁰⁰ and the Policy Seminar on Advancing Financial Inclusion.³⁰¹

The **Action Agenda on Advancing Economic, Financial and Social Inclusion in the APEC Region**, calls on members to take measures to empower women, youth, the elderly, persons with disabilities, rural communities and other underrepresented and vulnerable groups by removing barriers to training and employment, strengthening active labour market policies, bridging the gap between market needs

²⁹³ APEC, 'APEC Privacy Recognition for Processors System' (Singapore: APEC, November 2015), [http://www.apec.org/~media/Files/Groups/ECSCG/2015/APEC PRP Rules and Guidelines.pdf](http://www.apec.org/~media/Files/Groups/ECSCG/2015/APEC_PRP_Rules_and_Guidelines.pdf).

²⁹⁴ APEC, 'APEC Cross-Border Privacy Enforcement Arrangement (CPEA)', accessed 12 June 2019, <https://www.apec.org/Groups/Committee-on-Trade-and-Investment/Electronic-Commerce-Steering-Group/Cross-border-Privacy-Enforcement-Arrangement>.

²⁹⁵ The European Union General Data Protection Regulation came into force in May 2018.

²⁹⁶ APEC, 'APEC Collaborative Framework for Online Dispute Resolution' (*APEC 2019 First Economic Committee Meeting*, Santiago, Chile, 2019), http://mddb.apec.org/Documents/2019/EC/EC1/19_ec1_012.pdf.

²⁹⁷ APEC, 'APEC Framework on Human Resources Development in the Digital Age', 15 May 2017, <https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Human-Resources-Development/Framework>.

²⁹⁸ APEC, 'APEC Education Strategy' (*2017 APEC Education Network Meeting*, Nha Trang, Viet Nam, 2017), http://mddb.apec.org/Documents/2017/HRDWG/EDNET/17_hrdwg_ednet_003.pdf.

²⁹⁹ APEC, 'Policy Statement – APEC Ministers of Finance', 2012, https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Finance/2012_finance/annex.

³⁰⁰ APEC, 'APEC Improving Digital Financial Literacy Workshop' (*APEC 25th Finance Ministers' Meeting*, Port Moresby, Papua New Guinea, 2018), http://mddb.apec.org/Documents/2018/MM/FMM/18_fmm_016.pdf.

³⁰¹ APEC, 'Seminar on Financial Inclusion in APEC: Financial Capability, Education and Technology, Madang, Papua New Guinea, 5-6 June 2018 – Seminar Report' (*APEC 25th Finance Ministers' Meeting*, Port Moresby, Papua New Guinea, 2018), http://mddb.apec.org/Documents/2018/MM/FMM/18_fmm_015.pdf.

and individual competencies, and strengthening human resource development policies such as efforts on re-skilling and life-long learning.³⁰²

The **Boracay Action Agenda to Globalize MSMEs** calls for ICT and e-commerce to be harnessed to promote the internationalisation of MSMEs and integrate them into global value chains. It specifically calls for APEC to: (1) cooperate with the APEC Business Advisory Council (ABAC) in identifying and promoting strategic e-commerce platforms and innovative business models for MSMEs to support buying and selling activities (business-to-consumer), business matching opportunities (B2B), and online-to-offline (O2O) commerce; (2) implement capacity building in order to promote international networking and to increase cross-border business opportunities for MSMEs by localising/customising ABAC's Cross-Border E-Commerce Training (CBET) Programme and other similar platforms; (3) encourage the availability of next-generation high-speed broadband/internet and promote its use by MSMEs; and (4) ensure that policies and regulatory frameworks do not unnecessarily constrain the ability of MSMEs to participate in e-commerce.³⁰³

³⁰² APEC, 'Annex A: APEC Action Agenda on Advancing Economic, Financial and Social Inclusion in the APEC Region', 11 November 2017, https://www.apec.org/Meeting-Papers/Leaders-Declarations/2017/2017_aelm/Annex-A.

³⁰³ APEC, 'Boracay Action Agenda to Globalize MSMEs', 2015, https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Trade/2015_trade/2015_mrt_standalone.

POLICY RECOMMENDATIONS

The digital transformation in the form of new technologies and business models will continue to impact the economy and daily lives of people across the Asia-Pacific region. Whether the digital economy will turn out to be a boon or a bane will depend on the ability of economies to implement reforms and policies that can harness its opportunities while overcoming its challenges. Based on the report's analysis, the following policy recommendations are proposed for APEC economies to consider, bearing in mind their differing circumstances and levels of development:

- 1. Progress toward agreed definition(s) and clear measurement frameworks for the digital economy.** Definitions delineate the scope of coverage and allow statisticians to develop a corresponding measurement framework. A clear, well-elaborated measurement framework, supported by reliable statistics and regularly updated data that is comparable across sectors and economies will in turn allow policymakers to plan and make more informed decisions. Without baseline measures and data that can be tracked, it will be difficult to determine if policy objectives have been met or if adjustments should be made.
- 2. Develop and agree on policy-relevant indicators.** While measuring digital flows is important, it is also important to monitor the pace of digital transformation as it allows policymakers to better understand how digitalisation is changing the economy and to devise appropriate policy responses. Moreover, the advent of the digital economy has fundamentally changed the way business is conducted and the products and services that are traded. In this environment, it is also important to be able to monitor policies and regulations that have implications on the digital economy.
- 3. Get core structural reforms right with respect to the digital economy.** Core structural reforms in areas such as competition policy and law; regulatory reform; ease of doing business (EoDB); and public sector governance can be applied to the digital economy's opportunities and challenges. For instance, up-to-date competition policies can facilitate new market entrants and the uptake of new business models, while at the same time ensuring that digital technologies and tools are not exploited to the detriment of competition. Properly implemented, regulatory reform can lead to policies that are more in tune with the needs of businesses in the digital economy. Governments can play an important role in charting the direction of the digital economy by applying digital technology and tools in their public sector governance frameworks.
- 4. Supplement core structural reforms.** While new technologies and business models have created opportunities for many, not all have benefited. The digital economy can impact inclusion through different channels including destroying jobs and disrupting entire sectors of the economy. Furthermore, if not addressed, the lack of skills and limited access to infrastructure, technology and social protection can lead to exclusion and widening disparities. With regard to efforts to promote inclusive growth, this report has recommended two approaches based on the EC's *Three Approaches* document. The first (i.e. Approach II in the *Three Approaches* document) is to make structural reforms pro-inclusive by targeting areas such as education and skills, infrastructure and social security. The second (Approach III) involves implementing supporting policies alongside core structural reforms. This approach is often necessary to address deep-seated structural barriers that prevent women, MSMEs and traditionally marginalised groups from fully participating in the digital economy. The two approaches are often applied simultaneously.
- 5. Adopt a holistic approach to structural reforms for the digital economy.** When implementing structural reforms and supporting policies, policymakers need to ensure that they are well-coordinated, coherent and that they complement one another. For the digital economy to work seamlessly, it is important for economies to approach policy issues and objectives in a holistic rather

than in a piecemeal manner. Otherwise, there are risks that policies in one area would have inadvertent negative impacts on another. As an illustration, policies by one government agency to improve the business environment for digital firms could be offset by policies of another agency due to the lack of coordination or failure to consider other factors such as the effect on MSMEs. This requires policymakers to reach across traditional policy silos as well as across different ministries and levels of government to develop an integrated, whole-of-government approach to policymaking. In such efforts, it is important to include the private sector and other sectors of society. In this regard, there is potential for greater cooperation on digital economy issues between APEC fora and the APEC Business Advisory Council (ABAC).

- 6. Monitor trends and developments in the digital economy, including policy reforms and adapt accordingly.** The digital economy is relatively new and in constant flux. Structural reforms and supporting policies that work today may no longer be appropriate one to two years down the road. Therefore, they should continuously be reviewed along with the trends and developments of the digital economy.
- 7. Leverage and contribute to regional cooperation.** In the context of the digital economy, regional organisations such as APEC and their component fora can play an important role in facilitating discussion and knowledge sharing on best practices and innovative regulatory approaches to the emerging technologies and business models. Dialogues, workshops and other capacity building activities involving academia, private sector and other international organisations (IOs) can also contribute to driving conversations and collaborations on a variety of topics such as competition enforcement. In addition, APEC is well-placed to serve as a platform to identify opportunities presented by the digital economy, and to advance particular initiatives for cross-border collaboration. These can include using digital technology to facilitate cross border trade and investment, to enhance transactions through efficient and reliable payment systems, and to increase transparency and confidence in the provider-customer relationships. To avoid duplication and reinventing the wheel, APEC's regional cooperation efforts should refer to relevant digital economy work of IOs such as the World Bank (WB), the Organisation for Economic Co-operation and Development (OECD), the International Monetary Fund (IMF), the World Economic Forum (WEF), the Asian Development Bank (ADB), the Inter-American Development Bank (IADB), and others.



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