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Emerging tax issues in the digital economy

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Emerging Tax Issues in the Digital Economy

Janet S. Cuenca



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Emerging Tax Issues in the Digital Economy

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Abstract

The issues and challenges in taxation in the digital economy stem from the complex and multifaceted nature of digital economy. Reaching a common understanding and measurement of the size and impact of digital economy is critical in devising a tax regime for the digital economy. In APEC Secretariat (2019), the Philippines identified the major barriers and challenges (i.e., scoping and measurement of the digital economy, the regulatory and legal framework, i.e., including sandboxes, and digital infrastructure gap) to implementing structural reforms relating to the digital economy. It also identified the major policy gaps with regard to regulatory and legal framework, competition policy, and internet infrastructure improvements and consumer education on digital economy. The opportunities and challenges that the digital economy brings are particularly important for developing countries, including the Philippines. Thus, it is deemed critical for the Philippine government to eliminate the barriers and challenges and also, address the identified policy gaps to fully reap the benefits from the digital economy. The need for development strategies for the digital economy cannot be overemphasized. This paper argues that development strategies should first focus on developing domestic digital capacities.

Keywords: digital economy, digitalized economy, platform economy, electronic commerce, e-commerce, information and communication technology/ICT, taxation, digital tax, base erosion and profit shifting/BEPS

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Emerging tax issues in the digital economy

Janet S. Cuenca¹

1. Introduction

Digital economy has evolved with the rapid advances in technology since the term was first coined in the mid-1990s.² It reflects the varying nature and uses of technology across the years. As accounted in UNCTAD (2019), analyses of the digital economy in the late 1990s focused on the adoption of the Internet and its economic impacts (i.e., referred to as the Internet economy) while those in the mid-2000s centered on the conditions that are conducive for the Internet economy's emergence and growth. In subsequent years, analyses underscored digital technologies and various policies as well as the growth of information and communication technology (ICT) and digitally oriented firms. More specifically, recent studies emphasized on how digital technologies, services, products, techniques and skills are spreading across economies (i.e., through the process called digitalization)³ and also, on how digital products and services are disrupting traditional sectors (i.e., through digital transformation). In this light, the concept of digital economy is better understood in the context of digital technologies.

Advances in ICT have fueled digital transformations, improved business processes, and promoted innovation in all sectors of the economy. New business models have emerged thus altering the global business landscape. In this sense, the digital economy has changed the process by which goods and services are produced and marketed across borders (UNCTAD 2017a). In particular, "trade in goods is being replaced by services, as digital information transferred over the Internet takes the place of paper books, music CDs, and other tangible goods. The Internet is displacing newspapers and magazines as the dominant advertising medium. Amid these developments, platform-based businesses, which harness digital networks to facilitate transactions between other businesses and users, are expanding rapidly in scale, scope, and influence" (Morinobu 2018, p.1).

The digital economy is depicted by unprecedented reliance on intangibles, the massive use of data (particularly personal data), and the pervasive adoption of multi-sided business models (OECD 2014). As UNCTAD (2019, p. xv) put it, "the digital economy continues to evolve at breakneck speed, driven by the ability to collect, use and analyse massive amounts of machine-readable information (digital data) about practically everything. These digital data arise from the digital footprints of personal, social and business activities taking place on various digital platforms." On the other hand, digitalization has spawned challenges (e.g., digital divide and regulatory issues, among others) for policymakers at all levels of development across the globe.

"It would be difficult, if not impossible, to ring-fence the digital economy" (OECD 2018, p.2). More specifically, "given the increasingly pervasive nature of digitalization it would, however, be difficult, if not impossible, to "ring-fence" the digital economy from the rest of the economy for tax purposes (Kofler, Mayr, and Schlager 2017, p.523)." "In the digital domain, products and services are uploaded, downloaded and used without any product or

¹ The author was a research fellow at the Philippine Institute for Development Studies when she wrote the study.

² Don Tapscott coined the term "digital economy" in 1995 and discussed its concept in his book "The Digital Economy: Promise and Peril in the Age of Networked Intelligence," which was published by McGraw-Hill in 1996 (ILO 2018).

³ Defined as "the transition of businesses through the use of digital technologies, products and services" (UNCTAD 2019, p.4)

person physically crossing international borders. Significant profits often are generated from sources within countries without establishing a physical presence in those countries. This online environment presents complex and unique taxation challenges” (AICPA 2018, p.2). Governments are now facing the huge challenge of devising a taxation regime that generates revenue but at the same, does not reduce the benefits from digitalization.

Taxation of the intangibles (i.e., digital and cross-border flow of goods and services) has been a big challenge to tax policymakers and administrators, particularly because the current international tax framework was originally designed for “brick and mortar” economy. “Brick and mortar” businesses refer to those companies which have a physical presence or permanent establishment that is used to assign tax jurisdiction. In contrast, the new business models do not require a physical presence and so they easily cut across borders. With the rise in the digital economy, opportunities for tax avoidance have been unveiled. The business models that were pioneered by US-based technology giants such as Google, Apple, Facebook, and Amazon.com are grounded on international tax avoidance. Heavy reliance on digital technology, borderless economy, and outdated tax rules enables these business models to escape taxation in the jurisdictions where they do business (i.e., countries of consumption) and shift profits to low-tax countries (Moribonu 2018), otherwise known as tax havens.

“The taxation of digital transactions in a cross-border context presents several challenges to the concepts of the right to tax and the allocation of profits between countries (AICPA 2018, p.2).” Policymakers have exerted efforts in finding solution to ensure fair and effective taxation as the digital economy thrives (Kofler, Mayr, and Schlager 2017). These efforts can be traced back to the advent of the electronic commerce (or e-commerce for short) in the 1990s. International organizations (e.g., OECD, EU, and UN) have endeavored to define the challenges and come up with an international consensus on the best strategy to address these challenges (AICPA 2018). For instance, the OECD’s Base Erosion and Profit Sharing (BEPS) Action Plan recognizes the need for modernization (i.e., moving away from the traditional “brick and mortar” approach in taxation). Nevertheless, efforts by international bodies do not preclude individual countries from unilaterally proposing their own solutions.

With the growing internet economy in the Philippines, emerging tax issues in the digital economy certainly have implications for the country. In this regard, it is deemed critical to navigate and examine the various tax issues and challenges in the digital economy and explore the experience of other countries in taxation of digital transactions, taking note of the lessons and insights that are relevant to the Philippines. It requires good understanding of what digital economy is, what it covers, and how it works as well as the new business models that emerged in the digital economy. Such understanding is crucial in determining prospective tax base and drawing up tax measures that will generate revenues but at the same time, will not reduce the benefits from digitalization.

In this light, the paper attempts to address the following research questions:

1. What are the implications of digitalization for taxation? Example: potential implications for the existing international tax framework (e.g., fundamental concepts on allocating the taxing rights between jurisdictions and determining the relevant share of profits generated by multinational enterprises subject to taxation in a given jurisdiction).

2. What measures do different countries have indicated they would implement?
3. What is the framework for designing the tax regime as identified by different countries?

The rest of the paper is organized as follows. Section 2 provides an overview of the digital economy and what it covers. Section 3 delves into the emerging issues in the digital economy. The paper ends with the concluding remarks in Section 4.

2. Overview of the digital economy

There is no consensus yet on the definition of digital economy (UNCTAD 2019, APEC Secretariat 2019, UNCTAD 2017b). Bukht and Heeks (2017, p.1) noted that “the digital economy is growing fast, especially in developing countries. Yet the meaning and metrics of the digital economy are both limited and divergent.” Likewise, Lovelock (2018, p.5) pointed out that “there is no universally accepted definition of the digital economy.”

Based on UNCTAD (2019, p.3), “as the world is only at the early stages of digitalization, the evolving digital economy and several other related economic terms lack widely accepted definitions.” Due to novelty and lack of sufficient understanding or clarity on the concept of digital economy, various interpretations of the same term abound in the literature. In addition, digital economy “may reflect the high speed of technological progress. The time required for agreeing on standard definitions often lags behind the velocity of technological change.” In this regard, the UNCTAD report emphasized the importance of striking a balance between avoiding straitjacketing definitions (i.e., detrimental to progress) and achieving a common understanding of relevant concepts. “In a rapidly evolving situation, it is important to have some dynamic flexibility with definitions.” Nevertheless, the said report recognized the need for common ground on the meaning of terms used as this has implications for analysis of issues and formulation of policy responses.

According to APEC Secretariat (2019, p.5-6), “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... 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.” Moreover, the APEC report recognized the APEC economies’ varying interests and priorities relating to the digital economy. Given the complex and multifaceted nature of digital economy, it noted the challenge for APEC economies to have a common overarching definition of the term. However, the said report emphasized that “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.” Apparently, it attempted to contribute in APEC’s effort in addressing digital economy challenges and drawing up strategies to measure the many aspects of the digital economy.

As pointed out in UNCTAD (2019), the term digital economy may have many interpretations in relevant literature. In particular, Lovelock (2018, p.5-6) adopted a broader concept of digital economy, i.e., “the entirety of sectors that operate using Internet Protocol (IP)-enabled

communications and networks irrespective of industry.” Based on the difference in sectoral impact, it distinguished between the Internet economy (i.e., referring to the economic activities, inputs, outputs and employment directly associated with the use of the Internet) and digital economy (i.e., reliance on enhanced interconnectivity of networks and the interoperability of digital platforms in all sectors of the economy and society to offer convergent services).

According to ILO (2018, p.1), the generally agreed definition of digital economy is that “the term refers to all economic activities using the Internet as a platform and digital information and knowledge as key inputs for the process of producing, marketing and distributing goods and services. The concept is also defined as the economic processes made possible thanks to the existence of, and interaction with, the Internet, mobile networks and information technologies.”

In APEC Secretariat (2019, p.3-4), digital economy is defined in many ways, as follows:

1. Tapscott’s broad definition - 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’
2. IMF definitions - based on narrow definition, digital economy refers to ‘online platforms, and activities that owe their existence to such platforms’; based on broad definition, digital economy covers ‘all activities that use digitized data’, which arguably could refer to the entire economy.
3. World Bank definition - digital economy represents a new paradigm of accelerated economic development based on real-time data exchange; the prominent role of online platforms and data in such an economy is noted.

To provide other concepts of the digital economy, the said APEC report discussed Mesenbourg’s three (3) principal components of the structured accounting framework for the digital economy. To wit:

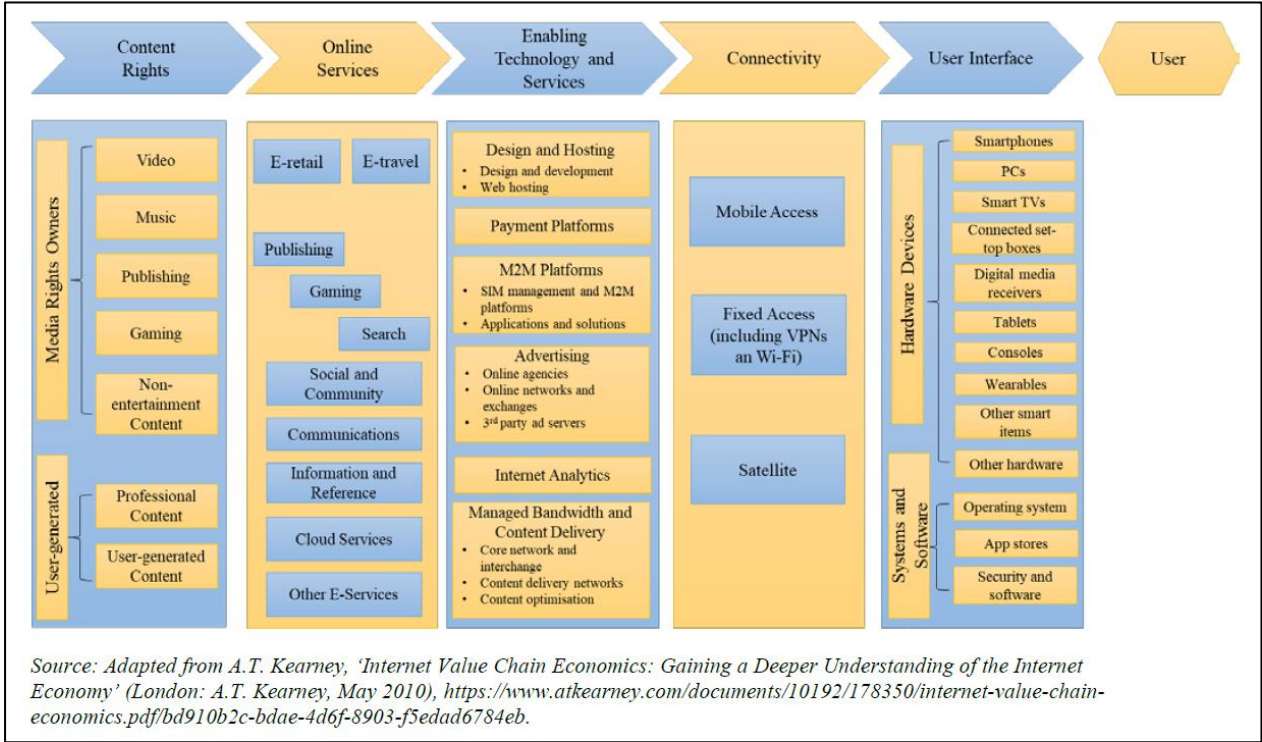
1. Electronic business (e-business) infrastructure –refers to the hardware, software, information and communications technology (ICT) services, and human capital that power and maintain the digital economy, including computers, software (such as operating systems), support services, and human programmers
2. E-business processes –refer to the processes business organisations conduct over computer-mediated networks, such as online procurement, electronic payments, teleconferencing, and management systems
3. Electronic commerce (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

In addition, it presented A.T. Kearney’s value chain perspective and also, the OECD-WTO conceptual framework for digital trade as the APEC Secretariat (2019, p. 5) pointed out that the digital economy can also be understood through the lens of digital trade. As illustrated in

Figure 1, the value chain perspective breaks down the internet ecosystem into five main clusters, namely:

1. First cluster - covers content rights which include copyright and media rights to movies, music and books as well as rights associated with content generated by users in digitally-enabled platforms;
2. Second cluster - pertains to online services such as ecommerce providers, including e-retail services (e.g., Amazon, MercadoLibre and Rakuten) and etravel 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);
3. 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;
4. 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); and
5. Fifth 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. Internet Value Chain: A Framework for Measuring Value in the Digital Economy



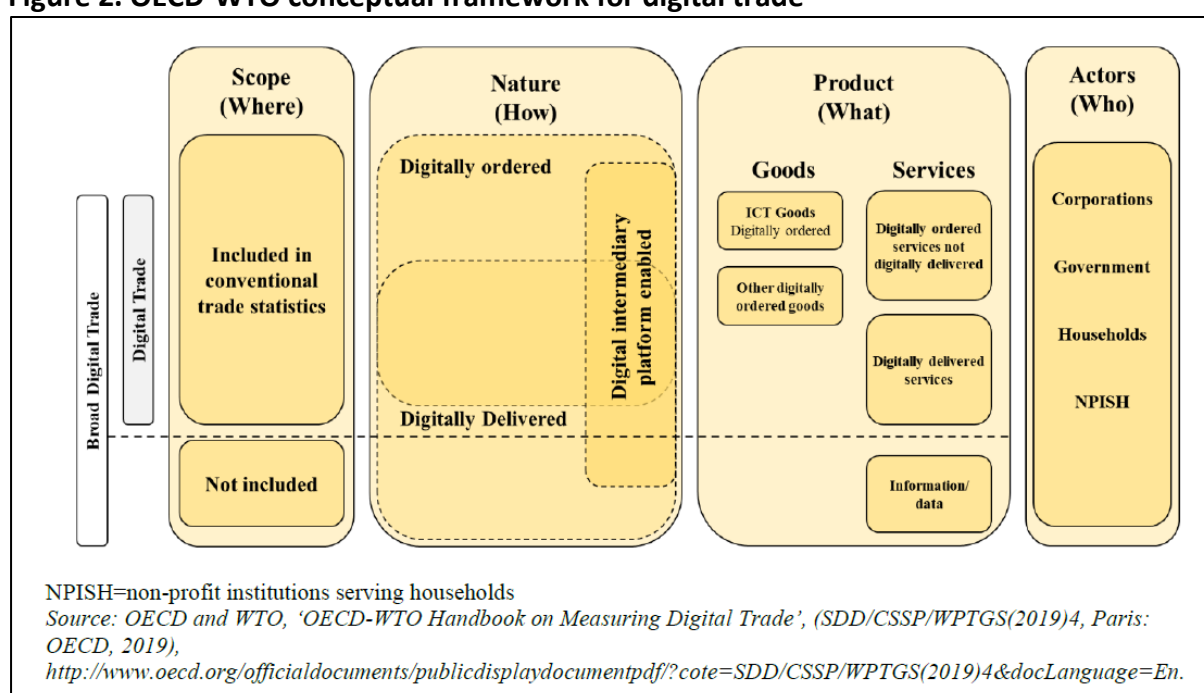
Note: Lifted from APEC Secretariat (2019)

Figure 2 shows the OECD-WTO conceptual framework for digital trade, which is defined as “all trade that is digitally ordered and/or digitally delivered.” The said framework represents “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)". It considers data and information as "a key and distinct product traded in the digital economy" (APEC Secretariat 2019, p.5). The three main non-exclusive modes of transaction in the digital economy are the following:

1. Digitally ordered transactions – cover the sale or purchase of goods and services conducted over computer networks (e.g., purchases of books via the publishers' website)
2. Digitally delivered transactions – include services and data flows delivered digitally as downloads for consumers, such as e-books, music and software
3. Digital intermediary platform transactions – refer to those transactions facilitated by intermediaries which include online e-commerce platforms (but without the platforms taking economic ownership of the goods or services being sold)

Figure 2. OECD-WTO conceptual framework for digital trade



Note: Lifted from APEC Secretariat (2019)

On the other hand, a compilation of the evolving definitions and concepts of the digital economy is provided in Table 1 (Bukht and Heeks 2017, p.6-10). Based on these definitions and concepts, the authors identified various perspectives on the digital economy (Box 1).

Table 1. Evolving definitions and concepts of the digital economy

Source	Definition	Focus
Tapscott 1996: <i>The Digital Economy: Promise and Peril in the Age of Networked Intelligence</i>	No direct definition but called it the "Age of Networked Intelligence" where it is "not only about the networking of technology... smart machines..."	Said to have first coined the term "digital economy". Emphasized that the digital economy explains the relationship between the new economy, new business, and new

Source	Definition	Focus
	but about the networking of humans through technology" that "combine intelligence, knowledge, and creativity for breakthroughs in the creation of wealth and social development".	technology, and how they enable one another.
Lane 1999: <i>Advancing the Digital Economy into the 21st Century</i> (Assistant to the US President for Science and Technology)	"the convergence of computing and communication technologies in the Internet and the resulting flow of information and technology that is stimulating all of electronic commerce and vast organisational changes".	Focused on e-commerce and the wider ramifications of the digital economy around issues such as privacy, innovation, standards, and the digital divide.
Margherio et al. 1999: <i>The Emerging Digital Economy</i> (US Commerce Department)	No explicit definition but identified four drivers: "Building out the Internet ... Electronic commerce among businesses ... Digital delivery of goods and services ... Retail sale of tangible goods".	First clear segmentation of the digital economy. Emphasized foundations of digital economy more than economy itself.
Brynjolfsson & Kahin 2000b: <i>Understanding the Digital Economy: Data, Tools, and Research</i>	"...the recent and still largely unrealized transformation of all sectors of the economy by the computer-enabled digitization of information".	Emphasized understanding the digital economy from various angles: macroeconomics, competition, labor, organizational change.
Kling & Lamb 2000: in Brynjolfsson & Kahin 2000a	"...includes goods or services whose development, production, sale, or provision is critically dependent upon digital technologies".	Segmented the digital economy into four parts: "Highly digital goods and services ... Mixed digital goods and services ... IT-intensive services of goods production" and the IT industry.
Mesenbourg 2001: <i>Measuring the Digital Economy</i> (US Bureau of the Census)	Defined the digital economy as "having three primary components": - "E-business infrastructure is the share of total economic infrastructure used to support electronic business processes and conduct electronic commerce" - "Electronic business (e-business) is any process that a business organization conducts over computer-mediated networks" - "Electronic commerce (e-	Focused on how to measure the emerging phenomena of e-business and e-commerce.

Source	Definition	Focus
	commerce) is the value of goods and services sold over computer-mediated networks".	
Economist Intelligence Unit 2010: <i>Digital Economy Rankings 2010</i>	No explicit definition but ranking of digital economy is based on: "The quality of a country's ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit".	Emphasis on the foundations for a digital economy rather than the digital economy itself with measures of: connectivity and technology infrastructure, business environment, social and cultural environment, legal environment, government policy and vision, and consumer and business adoption.
OECD 2013: <i>The Digital Economy</i>	"The digital economy enables and executes the trade of goods and services through electronic commerce on the Internet".	Main content relates to competition and regulation in digital markets, with additional discussion of network effects, interoperability, and open vs. closed platforms.
Department of Broadband Communications and the Digital Economy (DBCDE), Australia 2013: <i>Advancing Australia as a Digital Economy: An Update to the National Digital Economy Strategy</i>	"The global network of economic and social activities that are enabled by digital technology, such as the internet and mobile networks".	Key elements seen as readiness, environment and usage, and focus on policy measures to enhance the digital economy.
European Commission 2013: <i>Expert Group on Taxation of the Digital Economy</i>	"...an economy based on digital technologies (sometimes called the internet economy)".	Identifies characteristics of digital economy companies: <ul style="list-style-type: none"> • innovation through new sources of finance (venture capital) • importance of intangible assets • new business models based on network effects • cross-border e-commerce
British Computer Society 2014: <i>The Digital Economy</i>	"The digital economy refers to an economy based on digital technologies, although we increasingly perceive this as conducting business through markets based on the internet and the World Wide Web".	Key digital economy issues seen as innovation, rights, cyber-security and digital literacy.

Source	Definition	Focus
European Parliament 2015: <i>Challenges for Competition Policy in a Digitalised Economy</i>	"A complex structure of several levels/layers connected with each other by an almost endless and always growing number of nodes. Platforms are stacked on each other allowing for multiple routes to reach end-users and making it difficult to exclude certain players, i.e., competitors".	Focus on competition and regulation of the digital economy.
House of Commons 2016: <i>The Digital Economy</i>	"The digital economy refers to both the digital access of goods and services, and the use of digital technology to help businesses".	Focus on policies for regulation and support of the digital economy.
G20 DETF 2016: <i>G20 Digital Economy Development and Cooperation Initiative</i>	"...a broad range of economic activities that include using digitized information and knowledge as the key factor of production, modern information networks as an important activity space, and the effective use of information and communication technology (ICT) as an important driver of productivity growth and economic structural optimization".	Emphasis on networked and intelligent ICTs that enable economic activities. Focus on policy, including cross-national policy, priorities for the digital economy.
Elmasry et al. 2016: <i>Digital Middle East: Transforming the Region into a Leading Digital Economy</i> (Digital McKinsey)	No explicit definition: "less as a concept and more as a way of doing things", but with three attributes: "creating value at the new frontiers of the business world, optimizing the processes that execute a vision of customer experiences, and building foundational capabilities that support the entire structure".	Covers measurement of digitization, under-performance of the region, and strategies for government and business to accelerate progress towards a digital economy.
Bahl 2016: <i>The Work Ahead: The Future of Businesses and Jobs in Asia Pacific's Digital Economy</i> (Cognizant)	No explicit definition: instead, differentiation between "doing" and "being" digital (see also Asen & Blechschmidt 2016).	Focus on business value and profitability with advice to move from doing to being digital: "Businesses need to inject digital into the very core of what they do and how they interact and transact with customers, partners and employees. This means digitizing processes to supercharge profitability."

Source	Definition	Focus
Knickrehm et al. 2016: <i>Digital Disruption</i> (Accenture)	"The digital economy is the share of total economic output derived from a number of broad "digital" inputs. These digital inputs include digital skills, digital equipment (hardware, software and communications equipment) and the intermediate digital goods and services used in production. Such broad measures reflect the foundations of the digital economy".	Covers how to improve micro- and macro-economic growth through better use of digital economy foundations.
Rouse 2016: <i>Digital Economy</i>	"The digital economy is the worldwide network of economic activities enabled by information and communication technologies (ICT). It can also be defined more simply as an economy based on digital technologies".	Brief review of definitions.
Dahlman et al. 2016: <i>Harnessing the Digital Economy for Developing Countries</i> (OECD)	"The digital economy is the amalgamation of several general purpose technologies (GPTs) and the range of economic and social activities carried out by people over the Internet and related technologies. It encompasses the physical infrastructure that digital technologies are based on (broadband lines, routers), the devices that are used for access (computers, smartphones), the applications they power (Google, Salesforce) and the functionality they provide (IoT, data analytics, cloud computing)".	Emphasizes the potential of digital economies to deliver inclusive and sustainable growth, but only if key enablers are put in place.
OUP 2017: <i>Digital Economy</i>	"An economy which functions primarily by means of digital technology, especially electronic transactions made using the Internet".	Definition only.

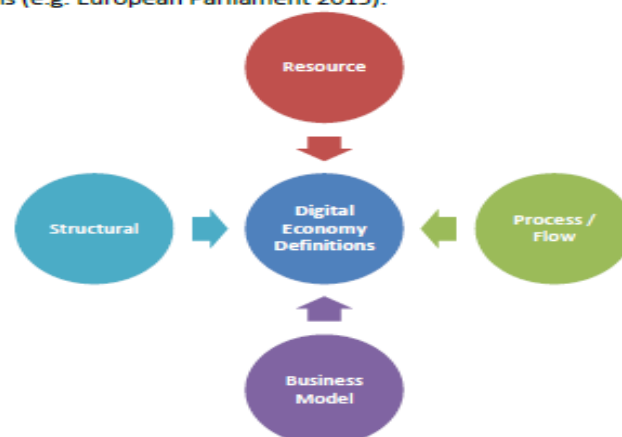
Source	Definition	Focus
Deloitte n.d.: <i>What is Digital Economy?</i>	"...the economic activity that results from billions of everyday online connections among people, businesses, devices, data, and processes. The backbone of the digital economy is hyperconnectivity which means growing interconnectedness of people, organisations, and machines that results from the Internet, mobile technology and the internet of things (IoT)".	Sees four main areas of digital transformation: future of work, customer experience, digital supply networks, and Internet of things.

Note: Lifted from Bukht and Heeks (2017)

Box 1: Perspectives on the Digital Economy

Analysing the digital economy definitions in Table 1, one can identify a number of different perspectives reflected:

- **Resource Perspective:** most obviously this rests on a *technology perspective* with many definitions identifying the technologies on which the digital economy is founded; but some include a *content perspective* that typically relates to the handling of data or information (e.g. Brynjolfsson & Kahin 2000b), and a *human resource perspective* that goes further to incorporate human knowledge or creativity or skills that are enabled by ICTs (e.g. Tapscott 1996).
- **Process/Flow Perspective:** many definitions cover the use of technologies to support particular business processes such as transactions/commerce (e.g. Kling & Lamb 2000, Mesenbourg 2001), while a few acknowledge the new flows of data or information that are enabled by ICTs (e.g. Lane 1999). This would include talking about the changes to processes that are occurring (e.g. Bahl 2016).
- **Structural Perspective:** may be rather generic in talking about economic transformation (e.g. Brynjolfsson & Kahin 2000b, G20 DETF 2016) or more specific in identifying the new web-/network-based structures that emerge as part of the digital economy (e.g. DBCDE 2013, European Parliament 2015).
- **Business Model Perspective:** lying between the process and structural perspectives, are the few definitions that bring in the idea of the new business models that are being enabled e.g. those that mention e-business or e-commerce (e.g. Mesenbourg 2001, European Commission 2013) or digital platforms (e.g. European Parliament 2015).



Alongside these direct components of definitions, we can identify:

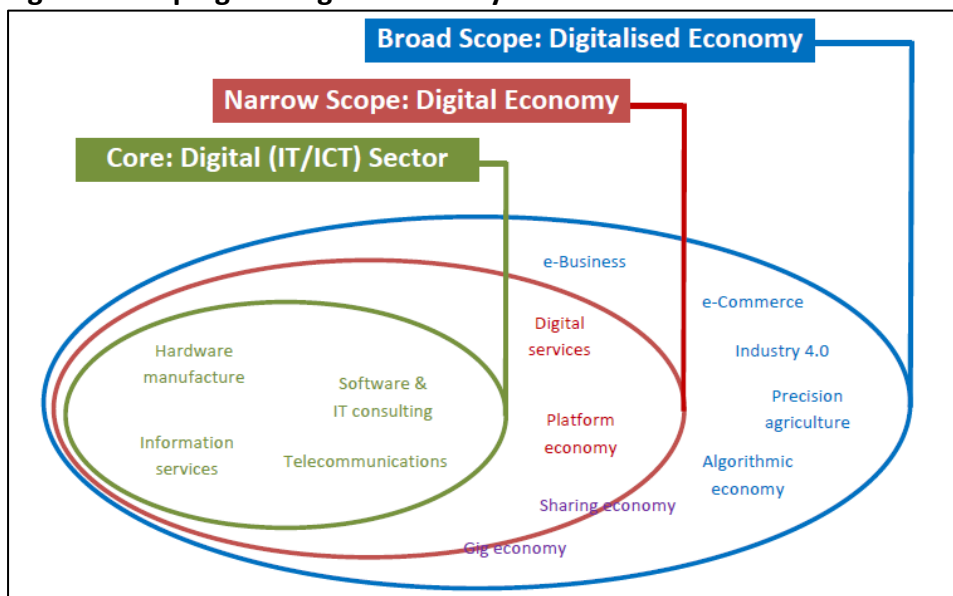
- **Discourse of Novelty, Urgency, Inevitability:** "Don't blink: the future is rushing straight at us" (Dean et al. 2012). Within the definitions and their surrounding discussion there is a continuous sense of novelty and change in relation to the digital economy: new technologies, new organisational forms (from processes through business models to structures), and implicit within this new values and norms. Particularly by consulting firms, but also by others, there is a sense of urgency; of action being needed now to put in place new business strategies and new government policies. And there is no questioning of the importance and inevitability of the digital economy's emergence. The questions are not whether the digital economy will grow or should be allowed to grow or in what ways it should grow; it is going to grow – especially in your competitor firms and nations – and the devil take the hindmost.

Note: Lifted from Bukht and Heeks (2017)

In addition, Bukht and Heeks (2017, p.1) developed a definition of the digital economy based on three scopes of relevance (Figure 3), as follows:

1. Digital sector - core of the digital economy which refers to the IT/ICT sector producing foundational digital goods and services;
2. True digital economy - part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services; covers the digital sector and the emerging digital and platform services; and
3. Digitalized economy – broad scope of the digital economy which refers to the use of ICTs in all economic fields.

Figure 3. Scoping the Digital Economy



Note: Lifted from Bukht and Heeks (2017)

In the same vein, UNCTAD (2019, p.4-5) elaborated the three (3) broad components of the digital economy. To wit:

- i. Core aspects or foundational aspects of the digital economy - include fundamental innovations (e.g., semiconductors, processors), core technologies (e.g., computers, telecommunication devices) and enabling infrastructures (e.g., Internet and telecoms networks);
- ii. Digital and information technology – refers to IT sectors which produce key products or services that rely on core digital technologies, including digital platforms, mobile applications and payment services; digital economy is greatly affected by innovative services in these sectors, which are making a growing contribution to economies, as well as enabling potential spillover effects to other sectors; and
- iii. A wider set of digitalizing sectors - includes those where digital products and services are being increasingly used (e.g., for e-commerce); comprises digitally enabled sectors in which new activities or business models have emerged and are

being transformed as a result of digital technologies (e.g., finance, media, tourism and transportation); digitally literate or skilled workers, consumers, buyers and users are crucial for the growth of the digitalized economy.

UNCTAD (2019) emphasized that the measurement of the extent and impact of the digital economy is based on these components. Table 2 shows the potential impacts on value creation and capture from an expanding digital economy.

Table 2. Potential impacts on value creation and capture from an expanding digital economy, by its components and actors

DIGITAL ECONOMY COMPONENT	ACTORS				ECONOMY-WIDE IMPLICATIONS
	Individuals (as users / consumers and workers)	MSMEs	Multinational enterprises / digital platforms	Governments	
Core, digital sector	<ul style="list-style-type: none"> New jobs for building and installing ICT infrastructure. New jobs in telecom and ICT sector, especially ICT services. 	<ul style="list-style-type: none"> Greater inclusion under suitable circumstances or spillovers/domestic linkages. Increased competition from cloud-service providers. 	<ul style="list-style-type: none"> Investment opportunities for companies that meet high capital, technological and skills requirements. 	<ul style="list-style-type: none"> Attracting investment. Tax revenues from the economic activity created. 	<ul style="list-style-type: none"> Increased growth, productivity and value added. Employment creation. Investment and diffusion of technologies; R&D likely located in high-income countries. Mixed trade impacts.
Digital economy	<ul style="list-style-type: none"> New jobs in digital services, especially for highly skilled people. New forms of digital work, including for the less skilled. 	<ul style="list-style-type: none"> New opportunities in digital ecosystems. Increased competition from foreign digital firms. 	<ul style="list-style-type: none"> Enhanced productivity from data-driven business models. Greater control of value chains using platform-based business models. New opportunities in the sharing economy. 	<ul style="list-style-type: none"> More tax revenue resulting from increased economic activity and formalization of enterprises. Lost customs revenue from digitalization of products. 	<ul style="list-style-type: none"> Higher growth, productivity and value added. Employment creation/losses. Higher investment. Aggregation of digital firms in some locations. Mixed trade impacts. Market concentration.
Digitalized economy	<ul style="list-style-type: none"> New jobs in ICT occupations across industries. Need for new skills as higher-value roles are redesigned using digital tools. Greater efficiency of services received. Job losses or transformation due to digitalization. Risk of worsened working conditions. Improved connectivity. More choice, convenience, customization of products for users and consumers. Lower consumer prices. 	<ul style="list-style-type: none"> Platform-enabled market access. Reduced transaction costs. Risk of "race to the bottom" in markets vs. ability to find a niche. Lost opportunities due to automation (e.g. logistics, business processes). New roles in service provision. New business opportunities for digitalized enterprises. 	<ul style="list-style-type: none"> Emergence of platform firms with data-driven models. Gains from efficiency, productivity and quality. Opportunities for the monetization of data. Increased competitive advantage to digital platforms. Increased market power and control of data value chain. Leading digitalization in different sectors. 	<ul style="list-style-type: none"> Increased efficiency of services through e-government. Increased revenue from customs automation. Unclear impact on tax revenue: increases from higher economic activity; losses from tax optimization practices by digital platforms and MNEs. Data-driven opportunities to meet various SDGs. 	<ul style="list-style-type: none"> Growth through improved efficiency in sectors and value chains. Productivity improvements. Innovation impacts. Potential crowding out of local firms in digitally disrupted sectors. Potential automation in low- and medium-skill jobs. Wider inequality. Mixed trade impacts. Impacts on structural change.

Source: UNCTAD.

Note: Lifted from UNCTAD (2019)

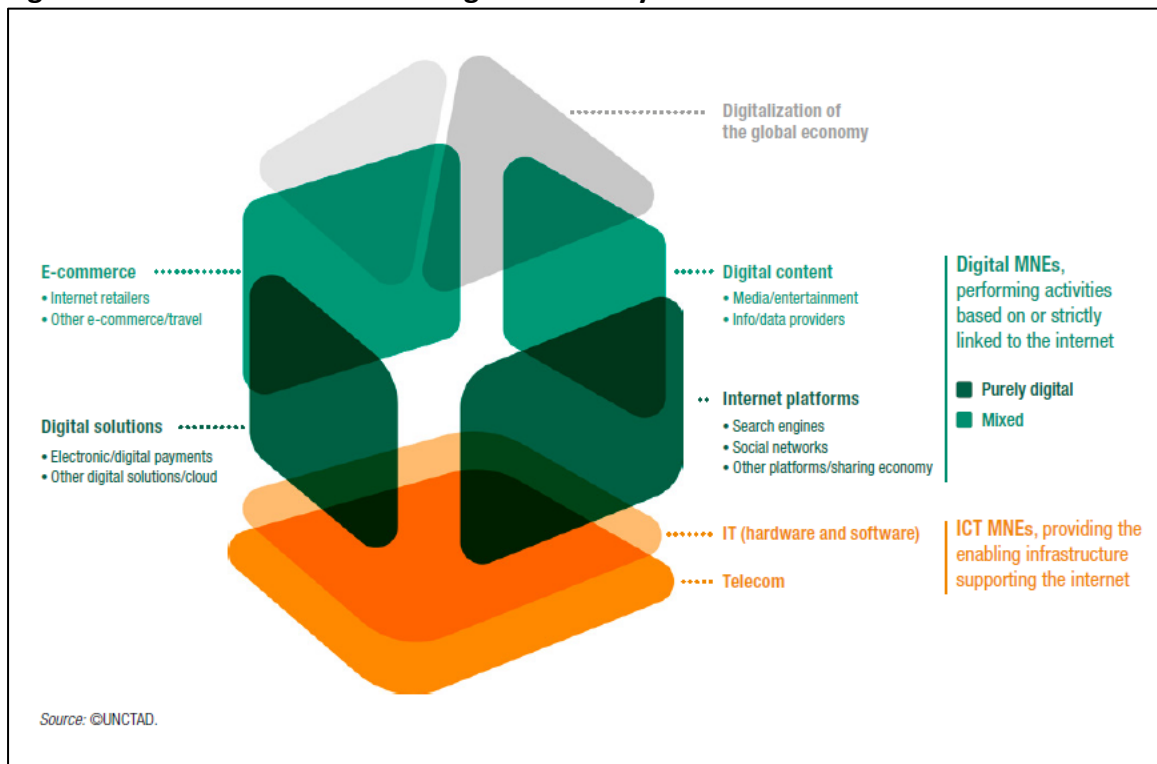
In contrast, UNCTAD (2017a, p.156) defined digital economy as “the application of internet-based digital technologies to the production and trade of goods and services.”⁴ As illustrated in Figure 4, it mapped the digital economy into two classifications of multinational enterprises (MNEs) (UNCTAD 2017a, p.165), as follows:

1. Digital MNEs are characterized by the central role of the internet in their operating and delivery model. They include purely digital players (internet platforms and providers of digital solutions) that operate entirely in a digital environment and mixed players (e-commerce and digital content) that combine a prominent digital dimension with a physical one.

⁴ In contrast, UNCTAD (2017b, p.3) defined digital economy as “the application of digital technologies for the conduct of economic activities within or between national economies. Digital economy encompasses both the production and use of digital technologies, good, and services.”

- a) Internet platforms: digitally born businesses, operated and delivered through the internet, e.g., search engines, social networks and other platforms, such as for sharing.
 - b) Digital solutions: other internet-based players and digital enablers, such as electronic and digital payment operators, cloud players and other service providers.
 - c) E-commerce: online platforms that enable commercial transactions, including internet retailers and online travel agencies. Delivery may be digital (if the content of the transaction is digital) or physical (if the content is tangible).
 - d) Digital content: producers and distributors of goods and services in digital format, including digital media (e.g., video and TV, music, e-books) and games, as well as data and analytics. Digital content can be delivered through the internet but also through other channels (e.g., cable TV).
2. ICT MNEs provide the enabling infrastructure that makes the internet accessible to individuals and businesses. They include IT companies selling hardware and software, as well as telecom firms.
 - a. IT: manufacturers of devices and components (hardware), software developers and providers of IT services
 - b. Telecom: providers of telecommunication infrastructure and connectivity

Figure 4. The architecture of the digital economy



Lifted from UNCTAD (2017a)

3. Emerging tax issues in the digital economy⁵

The issues and challenges in taxation in the digital economy spring from the complex and multifaceted nature of digital economy. IMF (2018, p.1) emphasized that “the lack of a generally agreed definition of the “digital economy” or “digital sector” and the lack of industry and product classification for Internet platforms and associated services are hurdles to measuring the digital economy.” Similarly, APEC Secretariat (2019, p.18) argued that the lack of consensus on a definition of the digital economy poses serious challenges in efforts to measure it. This raises important questions such as:

1. Should the digital economy be defined narrowly as those activities facilitated by online platforms, such as online purchasing and online movie streaming?
2. 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?

In addition, (IMF 2018, p.6) pointed out that “improved measurement of digital products and transactions could improve measurement of inflation, balance of payments developments affecting external sector stability, and financial stocks and flows of relevance for countering money laundering and tax evasion” In this light, reaching a common definition and measurement of the size and impact of digital economy is critical in devising a tax regime for the digital economy.

As evident in Section 2, digitalization covers a wide spectrum of ICT applications in business models and products and services. As such, digitalization can be viewed as “both an enabler and disruptor of businesses (IMF 2018, p.1).” Digital technologies and tools created new business models that disrupt traditional sectors and their practices. Lovelock (2018) and APEC Secretariat (2019, p.7-8) discussed the various digital disruptions that occur considering three (3) business models.

1. First model (i.e., based on substitution of existing products or services, enabled by digitalization) or product or service substitution; examples of which include the following:
 - a. music cassettes and compact disks being displaced by streamed music online (e.g., Line Music and Spotify)
 - b. movies that were previously store in physical media such as CDs and DVDs are now digitally delivered (e.g., Netflix)
 - c. printed motorway maps being displaced by GPS systems in smartphones (e.g., Google Maps and Waze) that are currently widely used in navigation
 - d. books and magazines that used to be available in physical form being displaced by e-books/e-magazines (i.e., saving costs related to printing and storage)

⁵ Some parts of this section were quoted in Serafica, Quimba, and Cuenca (2020, p.24-28)

2. Second model (i.e., involving digital services that by-pass traditional channels and reduce costs for end-users) or by-pass; For example:
 - a. payment no longer goes through existing gatekeeper, thus eliminating demand for its services (e.g., fund transfers through financial technology or fintech, for short like P2P funds transfer offered by TransferWise, i.e., by-passing banks or online insurance sales platforms, i.e., eliminating the need for an agent network)
 - b. firms that provide crowd-funding services and offer borrowers an alternative to bank financing such as Kickstarter and RocketHub
 - c. online purchase of insurance (e.g., FWD and DirectAsia)
 - d. online purchase of airline tickets/customized tickets (e.g., Expedia or Traveloka)
3. New digitally-enabled business model or technological paradigm shift (e.g., cloud computing, i.e., a fundamental change in how consumers procure, access and use IT infrastructure while offering lower costs and rapid scalability); to elaborate:
 - a. businesses subscribe to cloud services (e.g., Alibaba Cloud, Google Cloud, Amazon Web Services, and Microsoft Azure) instead of procuring and maintaining their own servers, thus providing firms the flexibility of adjusting their subscription based on needs and also, the benefit from some features (e.g., protection against hackers and cyberattacks, and enterprise solutions such as database management, data analytics, web hosting, and various human resources applications)

More specifically, APEC Secretariat (2019, p.8) provided examples of firms with new business models in Asia-Pacific Economic Cooperation (APEC) (Box 2).

On the other hand, Lovelock (2018, 7-12) explained that cloud computing, blockchain, or the Internet are referred to by economists as General Purpose Technology (GPT), which indicates their significant impact on all sectors of the economy and society. The study pointed out that “GPTs’ rate of adoption may vary from sector to sector, but as economies become increasingly interconnected they become embedded and ubiquitous.” It provided examples of these GPTs, highlighting their impact and associated challenges (Table 3). Nevertheless, the study cautioned that “the impact potential of most of these GPTs is yet to be fully revealed, but their applications are already being widely forecast likely giving rise to shifts in technology paradigms.”

In the same vein, IMF (2018, p.1) pointed out that “digitalization has penetrated many activities, and, indeed, almost the entire economy could be included in the “digital economy” broadly defined.” On the other hand, APEC Secretariat (2019, p.5) argued that “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.” The study posed thought-provoking questions such as these: “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?” Questions of this sort stir debate between one group contending that “it should be part of the non-digital economy since it is neither digitally ordered nor digitally delivered” and another group arguing

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.”

Box 2. 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 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 revolutionize the gaming industry.

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Note: Lifted from APEC Secretariat (2019)

Table 3. Examples of transformative and disruptive digital technologies

Technologies	Impact	Challenges
Infrastructure (or Connectivity) Issues		
5G (or ubiquitous connectivity)	5G networks will enable data collection and computation with billions of devices by providing seamless and continuous connectivity. More than just being faster than 3G and 4G LTE, 5G will "become the underlying fabric of an entire ecosystem of fully connected intelligent sensors and devices, capable of overhauling economic and business policies, and further blurring geographical and cultural borders." 5G is predicted to create 22 million jobs worldwide and USD 12.3 trillion of revenue across a broad range of industries.	The capacity, transmission speeds and latency that 5G needs to achieve requires operators to invest heavily in network trials and rollouts, with no guarantee as to returns on investment. In China alone, mobile network operators are forecast to spend a combined USD180 billion by 2023. Also, challenging will be standardizing spectrum bands and network interconnectivity, both of which will enable the low-cost access and universal interoperability demanded by core 5G use-cases, and which will be key to recouping investment.
Internet-of-Things and Machine-to- Machine networks	By 2020, there will be more than 20 billion installed IoT devices around the world generating massive amounts of data. With access to this kind of information, industries of all kinds will be able to reach new levels of efficiency as they add products, services, and capabilities.	Security is a major challenge to the IoT as newly connected "things" bring about new vulnerabilities. The hacking of baby monitors, surveillance cameras, smart fridges and so on exemplify the security threat that can only grow with the scale of the IoT. As the number of connected "things" increases, so will the amount of personal data collected, stored and transmitted over networks, therefore exacerbating risks that such data is compromised. Moreover, as data can be compromised at any one point in the IoT ecosystem, stakeholders (device maker, platform, network provider, end-user etc.) throughout the ecosystem should be vigilant and responsible for IoT security.
Cloud computing	Cloud computing technology delivers IT resources (such as software, computing power for data analytics, data storage) online as a service. Cloud services are scalable and on demand, accessible from all connected devices. They are changing procurement models both in the private and public sector and offer flexibility and lower costs with	While the benefits of cloud computing are widely understood and accepted, successful cloud adoption requires organisations to remove internal roadblocks by re-training employees and rethinking processes, in order to successfully overcome the constraints of legacy IT infrastructure.

Technologies	Impact	Challenges
	increased security features compared to traditional IT resources.	
Platform (or Management) Issues		
Data analytics	Big data is the fuel of the digital economy and data analytics is essential to make data-driven decision making possible. Data analytics also aid the optimization of service delivery and create competitive value chains in every industry.	A lack of interoperability - and standards or guidelines that facilitate the adoption of common methodologies and data formats - across different platforms limits the impact of big data.
Digital identity	Digital identity schemes are largely biometric and state-operated platforms, which enable the identification, verification and authentication of citizens. As a cornerstone of government services, such initiatives allow for targeted public service delivery without intermediaries, and increased participation.	The creation of a single digital identity will need to accommodate heightened security risks from a centralized digital identity management system, which can become a prime target for cybercriminals as it establishes a single point of failure for the entire identification system.
Blockchain	Blockchain technology can optimize the time and costs of any transaction with fast, verified, and highly secure movement of records based on decentralized and publicly validated distributed ledger. Blockchain has the potential to enable applications that allow to keep, identify and track exchanges and registers at minimum cost avoiding the potential risk of corruption. It allows community collaboration and business consolidation in various industries including payments, business services and logistics.	A standardization of blockchain technologies, or the ability for different blockchain technologies with different consensus algorithms to communicate with each other, is a missing piece of the puzzle in the applicability of blockchain. While there have been various initiatives, including the formation of an ISO technical committee, to examine standardization issues related to blockchain, a lack of internationally accepted standards has made firms developing blockchain Proof of Concepts (PoCs) wary about committing to the technology.
Quantum computing	Quantum computers will become the sixth paradigm in computing replacing bits with quantum bits, which allow them to solve complex problems beyond the capabilities of conventional computers. This leap forward in computing capability will enhance data processing and pattern recognition in machine learning, and significantly improve modelling capability in drug development, material science,	Development of actual quantum computers is still at an early stage due to the complexities in building an actual practical quantum computer. The quantum system needs to be protected from outside interference, yet still able to be used to make calculations and churn out an answer. Current solutions involve features like dampeners and extreme cold (approaching absolute zero) to

Technologies	Impact	Challenges
	climate change research and AI development.	insulate the actual quantum computer chip.
Application (or end-user) Issues		
Cryptocurrencies	Cryptocurrencies are digital currencies, where encryption technologies regulate the generation of units of currency and verify the transfer of funds, operating outside of the banking system. Bitcoin or Ethereum are well-known examples, though even they face public uncertainty about security and operational resiliency.	The real-life values of cryptocurrencies are highly volatile as they are dependent on demand and supply of users. A cryptocurrency's value is largely determined by the number of users and the amount of transactions that indicate the demand. In addition, liquidity is dependent on the demand and supply, where the lack of demand or supply may lead to a vicious cycle. Governments are still pensive on recognizing cryptocurrencies as a preferred mode of currency due to their inability to regulate it.
Artificial Intelligence	Artificial Intelligence (AI) enables new form of automation combining robotics and machine learning. AI will improve the speed, quality, and cost of available goods and services, but is also likely to displace large numbers of workers.	In addition to the challenges AI will face in its application to robotics and autonomous vehicles, the reliance of AI development on data input can lead to AI inheriting human- originated biasness that may limit the possibilities of applying AI in certain regards. For example, the dominance of white males in the AI industry has led to skewed outcomes such as AI-judged beauty contest that awarded mostly white candidates.
Robotics	Robots have been reshaping the division of labor between men and machines, and will increasingly do so outside of large factories as small- scale, adaptable production becomes more common in manufacturing processes. Robots will have a significant role in plastics, medical devices, food and beverages and the high-tech industries.	A common concern among policy-makers, workers and consumers is the ability to balance the economic and social impacts of robotics advancement. In Dongguan, China, a factory replaced 90% of its human workforce with machines, resulting in a 250% increase in productivity and 80% reduction in defects. Tax, liability and the displacement of workers are some issues that need to be addressed amid the coexistence of robots and humans in the workplace.

Technologies	Impact	Challenges
3D printing (Additive manufacturing)	3D printing makes products via an additive layer-by-layer approach and is a game changer in manufacturing as it enables mass-customization and reduces waste. It reduces time- to-market, eliminates the need for large inventories, lowers labor costs and transportation needs. By 2025, 3D printing can have an impact of USD 577 billion annually.	3D printing may bring forth copyright issues as strict enforcement of intellectual property rights on digital files containing information required for 3D printing may prove to be difficult, expensive and even counter-productive. In addition, the ability to use 3D printing technology to manufacture proprietary items, as well as illegal or controlled items such as guns, could trigger the need to regulate access to machines and materials, keeping costs high and out of reach of the mass market.
Autonomous vehicles	Enabled by 5G and sensor networks, autonomous vehicles (AVs) are a significant technological innovation as they will increase energy efficiency and have a significant impact on the labor market both in terms of job loss/creation and time savings.	Safety and accountability concerns go hand-in-hand. While a key factor driving the movement towards autonomous driving is its promise of reducing safety hazards, the new technology also presents new safety risks, especially in early stages of deployment. However, without the presence of a human driver, it is difficult to pin the responsibility on any one person (e.g., the car manufacturer, owner, software developer etc.) for any accident that may be caused by an autonomous vehicle.

Note: Lifted from Lovelock (2018)

Based on the discussion in Section 2 and examination of the examples of “disruptive” business models and GPTs presented in this section, it can be gleaned that the very nature of the digital economy makes taxation in the digital economy complicated. OECD (2014), particularly its Chapter 7, tackled broader tax challenges raised by the digital economy. In particular, it delved into the challenges relating to direct taxation (e.g., nexus, tax treatment of data, and characterization of payments under new business models) as well as indirect taxation (e.g., exemptions for imports of low-valued goods, and remote digital supplies to consumers). It also discussed the administrative challenges that tax administrations encountered in the application of the current rules (See Box 3). OECD (2014, p. 125) enumerated the major policy challenges with respect to direct taxation as follows:

1. Nexus - The continual increase in the potential of digital technologies and the reduced need in many cases for extensive physical presence in order to carry on business, combined with the increasing role of network effects generated by customer interactions, can raise questions as to whether the current rules to determine nexus with a jurisdiction for tax purposes are appropriate.
2. Data – The growth in sophistication of information technologies has permitted companies in the digital economy to gather and use information across borders to an

unprecedented degree. This raises the issues of how to attribute value created from the generation of data through digital products and services, and of how to characterize for tax purposes a person or entity's supply of data in a transaction, for example, as a free supply of a good, as a barter transaction, or some other way.

3. Characterisation – The development of digital products or means of delivering services creates uncertainties in relation to the proper characterisation of payments made in the context of new business models, particularly in relation to cloud computing.

Box 3. Administrative Challenges in the Digital Economy

The borderless nature of digital economy produces specific administrative issues around identification of businesses, determination of the extent of activities, information collection and verification, and identification of customers. There is a pressing need to consider how investment in skills, technologies and data management can help tax administrations keep up with the ways in which technology is transforming business operations. Operational work is underway with respect to these administrative issues within the Forum on Tax Administration.

• **Identification:** While global business structures in the digital economy involve traditional identification challenges, these challenges are magnified in the digital economy. For example, the market jurisdiction may not require registration or other identification when overseas businesses sell remotely to customers in the jurisdiction, or may have issues with implementing registration requirements, as it is often difficult for tax authorities to know that activities are taking place, to identify remote sellers and to ensure compliance with domestic rules. Difficulties in identifying remote sellers may also make ultimate collection of tax difficult.

Determining the extent of activities: Even if the identity and role of the parties involved can be determined, it may be impossible to ascertain the extent of sales or other activities without information from the offshore seller, as there may be no sales or other accounting records held in the local jurisdiction or otherwise accessible by the local revenue authority. It may be possible to obtain this information from third parties such as the customers or payment intermediaries, but this may be dependent on privacy or financial regulation laws.

Information collection and verification: To verify local activity, the market jurisdiction's tax administration may need to seek information from parties that have no operations in the jurisdiction and are not subject to regulation therein. While exchange of information can be a very useful tool where the proper legal basis is in place, this is predicated on knowledge of where the offshore entity is tax resident and information retained or accessible by the reciprocating tax authority. This can create challenges for a market jurisdiction revenue authority seeking to independently verify any information provided by the offshore entity.

• **Identification of customers:** There are in principle a number of ways in which a business can identify the country of residence of its client and/or the country in which consumption occurs. These could include freight forwarders or other customs documentation or tracking of Internet Protocol (IP) and card billing addresses. However, this could be burdensome for the business and would not work where customers are able to disguise their location.

Source: Lifted from OECD (2014, p. 137-138)

According to OECD (2014, p. 126), the above-mentioned policy challenges raised questions relating to the following:

1. Whether the current international tax framework is still appropriate or relevant in dealing with the changes that digital economy brings and the business models it creates;
2. Allocation of taxing rights between source and residence jurisdictions;
3. Paradigm used in determining where economic activities are carried out and value is created for tax purposes;
4. Double non-taxation that may arise from the lack of nexus in the market country under current rules and also, lack of taxation in the jurisdiction of the income recipient and of the ultimate parent company;
5. Issues relating to base erosion and profit shifting (BEPS)

More specifically, OECD (2014, p.126) provided examples of the challenges related to corporate income tax:

1. The characterisation of payments may trigger taxation in the jurisdiction where the payor is resident or established and hence overlap with the issue of nexus.
2. The collection of data from users located in a jurisdiction may trigger questions regarding whether it should give rise to nexus with that jurisdiction, and if so, whether and how the income generated from the use of these data should be attributed to that nexus. It also raises questions regarding how income from transactions involving data should be characterized for tax purposes.

On the other hand, the challenges associated with value added tax (VAT) systems arise particularly when goods, services, and tangibles are purchased from suppliers abroad in the absence of an effective international framework to ensure VAT collection in the jurisdictions of consumption. “For economic actors, and in particular small and medium enterprises, the absence of an international standard for charging, collecting and remitting the tax to a potentially large number of tax authorities, creates difficulties and high compliance costs. From a government viewpoint, there is a risk of loss of revenue and trade distortion, as well as the challenge of managing tax liabilities generated by a high volume of low value transactions, which can create a significant administrative burden but marginal revenues.”

In contrast, Evans et al. (2021) simply put the tax challenges from the digital economy as follows:

1. How to tax a multinational business (and other businesses) on sales into a territory where it has little or no physical presence?
2. How to assign a value to user-generated data and content and then tax that value?
3. How to compensate for the possible reduction in labor tax revenues resulting from the automation of routine tasks?

As mentioned earlier, “given the increasingly pervasive nature of digitalization it would, however, be difficult, if not impossible, to “ring-fence” the digital economy from the rest of the economy for tax purposes (Kofler, Mayr, and Schlager 2017, p.523).” “In the digital domain, products and services are uploaded, downloaded and used without any product or person physically crossing international borders. Significant profits often are generated from sources within countries without establishing a physical presence in those countries. This online environment presents complex and unique taxation challenges (AICPA 2018, p.2).

According to Lovelock (2018), the challenges are associated with extra-jurisdictional issues (e.g., domestic earnings flowing overseas and may be by-passing local taxation authorities). Taxing the intangibles (i.e., digital and cross-border flow of goods and services) is a big challenge to tax policymakers and administrators because the current international tax framework (i.e., originally designed for “brick and mortar” economy) has not yet been modified to take into account the complexities of the digital economy. As mentioned also earlier, heavy reliance on digital technologies, borderless economy, and outdated tax rules allow new business models to escape taxation in the jurisdictions where they do business (i.e., countries of consumption) and shift profits to low-tax countries (Moribonu 2018). “The taxation of digital transactions in a cross-border context presents several challenges to the concepts of the right to tax and the allocation of profits between countries (AICPA 2018, p.2).”

In the case of China, Yumin and Minquan (2021) pointed out the challenge in identifying taxation objects in digital economy. Currently, many consumer-to-consumer online transactions are not subject to tax. In addition, the said study noted that some multinational

companies are avoiding establishing physical business entities in China and thus, directly selling goods or services to Chinese residents through the portals of low tax countries, which result in by-passing of the tax supervision in China. To address the issues, Yumin and Minquan (2021) pointed out the need for China to (i) hasten the legislative process in the light of rapid development of the digital economy, (ii) to standardize tax collections in various types of digital businesses, and (iii) tap digital platforms as the tax withholding agent to ease the government's burden in tax collection, among others.

The latter has already been adopted in Indonesia. As of December 28, 2020, Indonesia appointed 52 digital companies as cross-border VAT collectors. According to Astuti (2021), 23 digital companies were able to collect VAT amounting to Rp616B (i.e., approximately US\$ 41M) via electronic system. Nevertheless, some issues remain to be addressed such as (i) minimizing compliance costs to get more overseas digital platforms on board, (ii) managing reliable data for appointing cross-border VAT collector, and (iii) tackling VAT fraud through law enforcement (e.g., the detail and procedures of imposing penalties are not yet clear).

Indeed, governments are now facing the huge challenge of devising a taxation regime that generates revenue but at the same, does not reduce the benefits from digitalization. More specifically, e-commerce⁶ poses a major challenge to the existing international tax framework, which was developed before the advent of digital economy.⁷ The tax issues are complex and thus far, there have been no reasonable and easily administrable scheme to tax e-commerce. E-commerce spawns tax policy and tax administration issues and so formulation of tax rules of e-commerce with practical administrative schemes will be difficult (Spencer 2014).

As Owens and Zhan (2019, p. 2) put it, “the inexorable march of technological advances and rapid evolution of business models across entire industries, in both the digital and the digitalized economy, are transforming international production, trade and GVCs, and they are challenging traditional norms of international taxation. Blockchain technology, fintech, cloud computing, artificial intelligence, the Internet of Things, 3D printing and Industry 4.0, among others, are disrupting modes of operation and cross-border processes, pushing the bounds of taxation. At the same time, these technologies open up new opportunities to transform the ways that tax administrations operate and interact with taxpayers.” Governments’ tax policy response to these pressures differed depending on their economic, political, and social contexts and also, on their tax systems’ level and structure.

Based on Evans et al. (2021), responding to the challenges involves the development of a new tax architecture through multilateral and unilateral approaches as well as the evolution of digital tax administration. Carrasco (2021) deemed it critical for developing economies in Asia to set goals for domestic resource mobilization and international tax cooperation that (i) necessitate tailored-fit approach appropriate for their specific contexts and level of development; (ii) develop strong ownership of reforms and political commitments, (iii) include medium-term revenue strategies and digital road maps of tax administration, and (iv) will promote development coordination. The said study noted the membership of ADB developing members (DMs) in global taxation efforts. In particular, as of January 2020, 27 DMs are members of The Global Forum while 19 DMs are members of the Inclusive Framework (IF) on Base Erosion and Profit Shifting (BEPS). In other words, 19 out of 46

⁶ Refers to “purchases and sales conducted over computer networks, using multiple formats and devices, including the web and electronic data interchange and the use of personal computers, laptops, tablets and mobile phones of varying levels of sophistication” based on OECD definition; “may involve physical goods, as well as intangible (digital) products and services that can be delivered digitally; payments and delivery can be made offline or online” (UNCTAD 2017b, p.3)

⁷ Another strand of literature on e-commerce tackles issues related to the WTO moratorium on customs duties on electronic transmissions (Serafica, Quimba, and Cuenca 2020)

DMs have not joined The Global Forum and thus, not committed to automatic exchange of information. Also, 27 out of 46 DMs have not joined the IF on BEPS. It should be noted that the Philippines was invited to participate as observer in the IF on BEPS. Policymakers have exerted efforts in finding solution to ensure fair and effective taxation as the digital economy thrives (Kofler, Mayr, and Schlager 2017). These efforts can be traced back to the advent of the electronic commerce in the 1990s. International organizations (e.g., OECD, EU, and UN) have endeavored to define the challenges and come up with an international consensus on the best strategy to address these challenges (AICPA 2018). Addressing Base Erosion and Profit Sharing (BEPS)⁸ has been a key priority in OECD/G20 (OECD 2013).

In 2013, OECD and G20 countries adopted a 15-point Action Plan (AP) to address BEPS. Such Action Plan was envisioned “to ensure that profits are taxed where economic activities generating the profits are performed and where value is created” (OECD 2014, p.3). For instance, the OECD’s BEPS Action Plan recognizes the need for modernization (i.e., moving away from the traditional “brick and mortar” approach in taxation). In 2015, OECD released the 2015 Final Report that contains the BEPS issues and broader tax challenges that BEPS raises as well as some recommendations (OECD 2015). In 2018, OECD released an interim report that provides an in-depth analysis of the main features of highly digitalized business models and value creation, as well as potential implications for the existing international tax framework (OECD 2018). In 2020, the OECD/G20 Inclusive Framework (IF) on BEPS issued a statement on the two-pillar approach to address the tax challenges arising from the digitalization of the economy. On Pillar One, IF endorses the Unified Approach that aims to address the issue on nexus and profit allocation. Pillar Two is work in progress which is meant to ensure a minimum level of taxation (OECD 2020).

While OECD/G20 countries recognize that digital economy cannot be separated from the rest of the economy, they are also aware that certain features of the digital economy may intensify the risks of BEPS for tax purposes. Advances in technological capabilities enable the business models of the digital economy (e.g., e-commerce, online advertising, and cloud computing) to leverage BEPS opportunities. Saint-Amans (2017, p.2) pointed out that “the techniques used to achieve BEPS by these businesses however, are generally not different from the ones used in other parts of the economy, and as such, countries agreed that the digital economy does not generate any unique BEPS issues, and that the solutions designed to tackle BEPS practices in the 14 other points of the BEPS Action Plan should suffice to address these concerns.

Aside from the issue of BEPS and tax avoidance, the key features of the digital economy pose more systematic challenges for tax policymakers that can be categorized into “broader tax challenges” such as (i) the difficulty of collecting VAT/GST in the destination country where goods, services and intangibles are acquired by private consumers from suppliers based overseas which may not have any direct or indirect physical presence in the consumer’s jurisdiction; (ii) the ability of some businesses to earn income from sales from a country with a less significant physical presence in the past, thereby calling into question the relevance of existing rules that look at physical presence when determining tax liabilities; and (iii) the ability of some businesses to utilize the contribution of users in their value chain for digital products and services, including through collection and monitoring of data, which raises the issue of how to attribute and value that contribution (Saint-Amans 2017, p2).

⁸ Refers to tax planning strategies employed by multinational enterprises (MNEs) that exploit gaps and mismatches in tax rules for tax avoidance (OECD 2015)

As regards VAT/GST collection, the BEPS project elicited international agreement with respect to the recommendations “to allocate the collection of VAT on cross-border B2C supplies to the country where the customer is located.” On the other two broader tax challenges, the technological developments and business models (e.g., the Internet of things, robotics and the “sharing economy,” among others), “may prove influential and disruptive in the near future.” This raises questions “as to whether the existing paradigm used to determine where economic activities are carried out and where value is generated for income tax purposes continues to be appropriate” (Australian Government 2015; Saint-Amans 2017, p3).

Whether these challenges are sufficiently critical in scale and impact is not yet determined so as to justify changes in the current international framework that are beyond what is proposed in the package of measures to address BEPS as of October 2015. Some potential options have been identified and analyzed to address these challenges. They include, among others, withholding tax on digital sales and defining a new concept of nexus based on having a “significant economic presence” (Saint-Amans 2017, p3).

Nonetheless, there is need to monitor new technological developments and new tax policy responses that governments adopt to tackle tax challenges. It is critical to assess whether policy solutions (or options) are appropriate in addressing these challenges, cognizant of the implications of a fully-digital world for the fundamental assumptions of the international tax system. In particular, the increasing contribution of consumers to value creation by just providing information is not yet captured in rules of international taxation. It is critical to develop “nexus” rules by expanding the definition of permanent establishment to include “digital presence” as determined by the location of consumers or users. In addition, it is important to modify the formulas for allocating taxable income to incorporate the users’ contribution. The BEPS IF is considering these recommendations (Morinobu 2018).

To date, international consensus on the best strategy to address tax issues and challenges in the digital economy has not been attained. Nevertheless, members of BEPS IF are committed to reach an agreement on a consensus-based solution by end of 2020 (OECD 2020). While waiting for the international consensus, individual countries are not precluded from unilaterally proposing their own solutions. A number of countries have proposed/enacted tax rules/measures to generate revenues from the digital economy.

In the case of the Philippines, the Bureau of Internal Revenue (BIR) issued the Revenue Memorandum Circular (RMC) 55-2013, which reiterates that the taxation rules and guidelines on non-online transactions are applicable to online transactions (e.g., business to consumer, consumer to consumer, and business to business. More specifically, Section II of RMC 55-2013 stipulates that “existing tax laws and revenue issuances on the tax treatment of purchases (local or imported) and sale (local or international) of goods (tangible or intangible) or services shall be equally applied with no distinction on whether or not the marketing channel is the internet/digital media or the typical and customary physical medium.” In 2020, the BIR issued the RMC 60-2020 to notify all persons engaged in business and earning income, particularly those who are into digital transactions to register their businesses. The said RMC covers all partner sellers/merchants as well as other stakeholders (e.g., payment gateways, delivery channels, internet service providers, and other facilitators).

In addition, there are pending bills in the House of Representatives that aim to levy tax on digital transactions. In particular, House Bill (HB) 6122 (i.e., An Act Protecting Consumers and Merchants Engaged in Internet Transactions, Creating for this Purpose the Ecommerce

Bureau and Appropriating Funds Therefor) proposes the creation of the E-commerce Bureau, registration of online businesses/enterprises, and exemption from business tax in the first two years of operation. On the other hand, HB 6765 (i.e., An Act Establishing a Fiscal Regime for the Digital Economy, Amending for the Purpose Sections 57, 105, 108, and 114 of the National Internal Revenue Code, and for Other Purposes) proposes changes in the way the digital economy is being taxed, i.e., to better capture the value created into the tax system. More specifically, the said bill has the following objectives:

1. It will make “network orchestrators” like Grab, Angkas, and other similar services that link customers and providers withholding agents for income taxes, to ease their partners of the burden of having to pay their own taxes, while also encouraging tax compliance.
2. It will clarify that services rendered electronically in the course of trade or business are liable to VAT. This will, once and for all, set a statutory clarification of a long-standing question of whether services rendered electronically can be subjected to VAT.
3. It will clarify that such services as digital advertising by internet giants (e.g., Google and Facebook and subscription-based services such as those of Netflix and Spotify, are subject to VAT.
4. It will make network orchestrators for lease services such as AirBnB, and ecommerce platforms such as Lazada and Shopee withholding agents for VAT, easing their partners of regulatory and tax compliance burden while improving overall tax compliance.

Annex A presents AICPA (2018)’s summary of these tax laws/measures proposed and adopted by various countries. Morinobu (2018) noted that the growing digital economy may prompt a shift toward consumption-based taxation. As mentioned earlier, the growing international consensus is for VAT/GST to be applied to digital products and services imported by consumers (e.g., Japan, Norway, South Africa, South Korea, Switzerland, and EU member countries) [Australian Government 2015].

Nevertheless, Vasal (2018) argued that the absence of effective tax rules for digital transactions leaves tax authorities the option to force-fit existing tax rules, which are designed for non-digital world. As a result, there is asymmetry, double tax burden, and in some cases, excessive profit allocation. Although the OECD Action Plan offered possible options such as nexus-based test (i.e., significant economic presence), withholding tax for digital transactions, and equalization levy, he cautioned countries to adopt these methods in domestic laws provided they are consistent with their international legal commitments (e.g., tax treaties). Furthermore, some country’s digital taxation initiatives like those of EU, UK, and Australia have met retaliation (e.g., US Pres. Trump’s policy responses) and negative repercussions (e.g., Amazon’s geoblocking of Australians, i.e., diverting them to local websites).

In the final analysis, there are remaining issues and challenges that need to be addressed for countries to fully benefit (i.e., through tax revenue generation) from the digital economy. Valente (2018, p.7) posed seven (7) pending questions that should be addressed to be able to move forward:

1. On what conditions can a jurisdiction tax income where it considers that its economy has effectively contributed to value creation by the taxpayer in the total absence of any physical presence? Could, for example, the remote programming of a robot constitute a sufficiently connective link?

2. Is the collection of value adding data from a specific jurisdiction a sufficient link for that jurisdiction to claim taxing rights on the value so created? What volume of data should be collected? Is there any difference if the collection of data is agreed to by the consumer?
3. Which jurisdiction has what power to tax the value created from the analysis of data, i.e. (a) the jurisdiction of the entity benefiting from the results extracted from the data analysis; (b) the jurisdiction where the collection and/or analysis of data takes place, regardless of how remote; (c) the jurisdiction(s) of the persons whose data is collected and analyzed, taking into account ownership of the data; or (d) the jurisdiction to which the data relates?
4. How should the following be evaluated: (a) raw data; (b) analyzed data; (c) the extraction of conclusions; and (d) how should the value arising therefrom be apportioned between and among jurisdictions?
5. How should transactions taking place exclusively between consumers, i.e., C2C transactions, and the income so arising be characterized for the allocation of taxing rights?
6. Should the avoidance of a loss be considered to be taxable profit? Should consumers and/or users be taxed in respect of the deemed benefits derived from the transmission of data owned?
7. Can mere online surfing be considered to be value adding and, therefore, taxable?

4. Conclusion

The issues and challenges in taxation in the digital economy stem from the complex and multifaceted nature of digital economy. Reaching a common understanding and measurement of the size and impact of digital economy is critical in devising a tax regime for the digital economy. Based on APEC Secretariat (2019, p.211-212), the Philippines identified scoping and measurement of the digital economy as one of the barriers and challenges (i.e., along with regulatory and legal framework including sandboxes and digital infrastructure gap) to implementing structural reforms relating to the digital economy.

In particular, the APEC report noted the country's "lack of official industry data that will measure the contribution of digital trade to the economy's overall economic growth. There is no single standard definition of digital trade and technical innovations and new business models do not exactly fit with in the traditional sectoral classifications (e.g., Grab). Nonetheless, the Philippine Statistics Authority has started efforts in August 2018 to measure the contribution of the digital economy to the gross domestic product (GDP)." Nevertheless, according to Ilarina, Polistico, and Pascasio (2019), the satellite accounts are not yet formulated and still, there is lack of statistics that explicitly measure the digital economy. The said study also pointed out the lack of international definition and statistical framework as well as international guidelines with regard to measurement of the digital economy.

As regards regulatory and legal framework (including sandboxes), the said report noted that “regulatory barriers inhibit businesses to explore and invest in more digital technology solutions. Reforms and initiatives are needed to clear bottlenecks and obstacles to functioning digital economy.” On digital infrastructure gap, the report listed some problems concerning internet availability (i.e., 74% of secondary schools lack internet access), affordability (e.g., prices of ICT services are among the highest in ASEAN), and reliability/quality of digital infrastructure (i.e., slow internet speed, which is at the lowest among economies in the Asia Pacific).

In the same APEC report, the Philippines also identified major policy gaps relating to the digital economy, particularly with regard to regulatory and legal framework (including sandboxes), competition policy, and internet infrastructure improvements and consumer education on digital economy. With respect to regulatory and legal framework (including sandboxes), the said report noted that entry of new players in the ICT sector is hindered by limitation in ownership. Eliminating such restrictions will foster competition and innovation. Nevertheless, the report emphasized that legislation on easing the limitation of foreign participation, particularly in transportation and telecommunication is yet to be enacted. Moreover, there is no legal framework yet to regulate business platforms and facilitate new digital products. Furthermore, there is lack of standard permit issued across LGUs, thus hampering the accelerated deployment of needed infrastructure.

As regards competition policy, the report underscored the need for competitors in the private sector, particularly telecommunications companies that are crucial in the digital economy. On internet infrastructure improvements, it is critical to explore the minimum standards for reliable and affordable internet access. Lastly, the report noted the importance of consumer education on digital economy which can be provided by key players in the digital economy from both the public and private sector. Consumer education should include awareness on the value that can be derived from the digital economy and also, the strength of security of digital transactions.

According to UNCTAD (2017a), the opportunities and challenges that the digital economy brings are particularly important for developing countries, including the Philippines. Thus, it is deemed critical for the Philippine government to eliminate the barriers and challenges and also, address the identified policy gaps to fully reap the benefits from the digital economy. The need for development strategies for the digital economy cannot be overemphasized. The development strategies should first focus on developing domestic digital capacities. In particular, the gap in digital infrastructure must be addressed. This necessitates estimation of investment requirements.

Based on UNCTAD (2019, p.5), digital infrastructure is another concept that still lacks a universally accepted definition. However, the said report proposed different levels of digital infrastructure such as (i) ICT networks (i.e., the core digital infrastructure for connectivity); (ii) data infrastructure (i.e., data centers, submarine cables and cloud infrastructure); (iii) digital platforms (i.e., not strictly infrastructure but can also be agents participating in the activity that takes place on them, or performing infrastructure-like functions by connecting two or more sides of a market.; and (iv) digital devices and applications. According to some experts, data can be considered part of the digital infrastructure. The UNCTAD report also identified electricity infrastructure as essential in enabling the use of digital infrastructure, which requires power to operate. The available digital infrastructure in the country can be assessed against these categories.

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ANNEX A

Annex Table 1. Description of existing and proposed taxes on digital economy: Preliminary Discussion

Country	Summary
Australia	The release of a discussion paper exploring options for taxing digital business in Australia is expected soon.
Austria	Introduction of the concept of a virtual permanent establishment, aimed at taxing profits of multi-national enterprises (MNE) active in the digital economy having an online presence but no physical presence
Chile	Plans to introduce a tax on revenues of foreign companies that provide digital services in Chile through online platforms
Germany	Coalition agreement of the current ruling parties expressly supports taxing large digital companies.
Malaysia	Practice note issued on the tax treatment of digital advertising provided by non-residents. Payments made to a nonresident digital advertiser subjected to withholding tax if the nonresident does not have a PE or a business presence in Malaysia.
Norway	Proposal issued requesting an assessment of different ways MNEs with a digital business model are taxable
OECD	Released an interim report on the taxation of the digital economy, including a history, as well as discussions related to business models and value creation, implementation, relevant tax policy developments, adapting the international tax system, interim measures, and the impact of digitalization on other aspects of the tax system
Singapore	Singapore advocates tax certainty for businesses; tax neutrality between traditional and digital business models; and international consensus on issues relating to the taxation of the digital economy.
United Kingdom	Her Majesty's Revenue and Customs (HMRC) issued an updated position paper on the challenges posed by the digital economy for the corporate tax system and its preferred solutions. The update includes plans for a sales levy on internet-based companies as a temporary solution.

Source: (AICPA 2018)

Annex Table 2. Description of existing and proposed taxes on digital economy: Proposed Laws/Rules

Country	Summary
Estonia	In response to the EU's digital tax package, Estonia suggested different thresholds apply for each member country considering the size of each member country.
EU	Two proposals issued for the taxation of digital economy companies: (i) Temporary Digital Services Tax imposed on revenue or turnover (ii) Long-term solution requiring companies to pay tax in each EU member where they maintain a "significant digital presence" or a "virtual permanent establishment"
Indonesia	Proposal to introduce a 0.5% tax rate on digital economy transactions
Latvia	Draft tax bill released for digital economy transactions that includes measures to track transactions occurring through online platforms, including joint ventures that conduct online transactions; and provide rules for nonresident websites whose only economic activity is advertising
Romania	Approved the EC's recommendation for a temporary Digital Services Tax
Spain	Announced intention to introduce a digital services tax, in line with the EU draft directive. Expected to send a proposed law to Spanish Congress within 3 months of approval of the 2018 budget

Source: (AICPA 2018)

Annex Table 3. Description of existing and proposed taxes on digital economy: Enacted Laws/Rules

Country	Effectivity	Summary
Brazil	Jan. 1, 2018	A federal law was approved that authorizes cities to create a minimum service tax on companies that provide video, imaging, sound, and text for downloading, as well as the sale of applications. San Paulo and Rio de Janeiro have both imposed a minimum service tax.
Colombia	Jan. 1, 2017	New law provides that provision of digital services by non-resident companies to a Colombian beneficiary are subject to VAT. Credit and debit card issuers and other payment processors will withhold Colombian VAT, subject to implementation regulations that are not yet issued.
Hungary	July 1, 2017	Enacted new law on the taxation of online advertising revenues
India	April 1, 2019	Enacted new law that “significant economic presence” of a non-resident in India will constitute a “business connection”
Israel	April 11, 2016	Establishes new digital “significant economic presence” PE rules
Italy	Jan. 1, 2019	The new law introduces a 3% tax on digital services provided to Italian companies and PEs.
Saudi Arabia	July 30, 2015	Establishes new virtual service permanent establishment rules
Singapore	Jan. 1, 2020	Extended goods and services tax on imported services
Slovakia	Jan. 1, 2018	Digital platforms facilitating transport and lodging services in Slovakia are subject to a new regulatory regime. Digital platforms that act as a marketplace for such services in Slovakia must register a PE.
South Africa	Oct. 1, 2018	VAT rules were amended to include in the definition of “enterprise” the supply of “electronic services” by a nonresident to a recipient in South Africa.
Taiwan	May 1, 2018	Enacted new law clarifying the taxation of income obtained by foreign companies from cross-border sales of electronic services to residents
Thailand	May 14, 2018	Two emergency decrees issued on taxation of digital asset business operations and Thai tax ramifications on certain income earned from digital assets

Source: (AICPA 2018)