

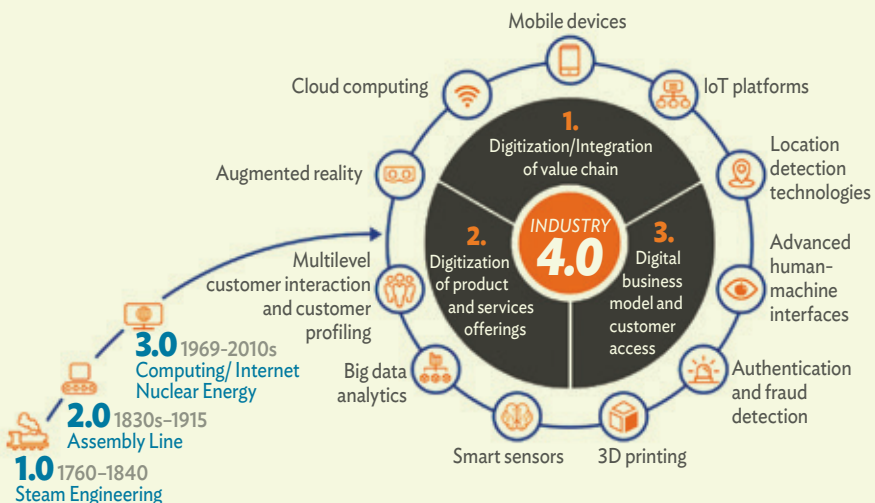
Introduction and Overview

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1.1. Background

Globally, the Fourth Industrial Revolution is fundamentally shifting the way we live, work, and create value. New technologies and applications are connecting individuals, organizations, and machines at unprecedented scale and speed. And this greater interface across the physical, digital, and biological worlds has been made possible by advances in artificial intelligence (AI), robotics, the Internet of Things, 3D printing, genetic engineering, quantum computing, and other technologies (Figure 1.1).

Figure 1.1: Situating the Digital Economy in the Fourth Industrial Revolution



IoT = Internet of Things.

Sources: Otañez (2017) and Moore (2019).

The revolution is transforming the services sector with wide-ranging applications in retail markets, financial sector, manufacturing, and agricultural production and value chain. Digital apps are matching supply and demand in real time, data analytics are improving credit scoring, the application of AI is improving crop yields, and automation in manufacturing is enhancing efficiency, among many others. The coronavirus disease (COVID-19) pandemic has also accelerated the adoption and application of digital and Fourth Industrial Revolution technologies, which offers essential tools for survival and business continuity while mitigating the risk of physical contact. The potential economic benefits are vast and, if harnessed properly, will contribute to inclusive and sustainable development.

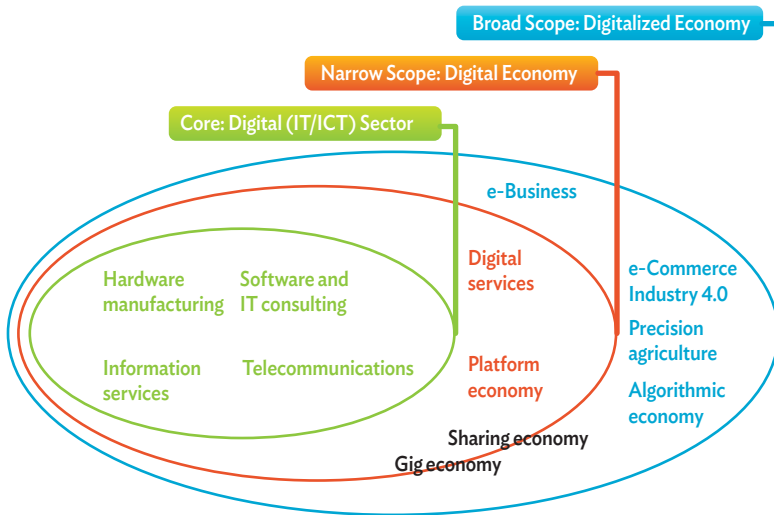
A key component of the Fourth Industrial Revolution is the digitalization of economic transactions and markets, underpinned by big data, data analytics, and Internet of Things. This digitalization, along with software development and application, has fueled the transition from the Third Industrial Revolution, which saw computers and the internet emerge.

This volume analyzes digital platforms or marketplaces, a segment of this emerging digitalized economy. Figure 1.2 shows that the digital economy has core, narrow, and broad scopes. The latter includes digital technologies for undertakings such as automation, AI, and e-commerce, as well as sharing and gig economies. Generally, digital platforms exhibit three defining characteristics: they (i) are mediated through technology, (ii) link user groups, and (iii) allow these groups to perform varied tasks.

A digital platform or a digital marketplace is defined as an intermediary and infrastructure that brings together different parties through the internet to interact, matching supply and demand in a multisided market. As a virtual matchmaker, the digital platform provides a mechanism for consumers and suppliers of products and services to conduct various value-creating transactions, including information exchange, demand matching, payment and receipt, and delivery of said goods and services.

Digital platforms are transforming how people work, socialize, and create economic value. Examples of successful social media digital platforms include Facebook, Instagram, LinkedIn, TikTok, and Twitter. In search and marketing, notable names are Google, Yahoo!, and Baidu. As regards video sharing and music streaming, popular platforms include YouTube and Spotify. In e-commerce,

Figure 1.2: Three Scopes of Digital Economy



ICT = information and communication technology, IT = information technology.
Source: Bukht and Heeks (2017).

Amazon and Alibaba are two of the well-known platforms. And in service-sharing segment, the prominent players include Airbnb, Grab, Uber, and GrubHub. These digital platforms use data obtained from their search and tracking facilities and algorithms to (i) lower the cost of obtaining and applying information, (ii) circumvent intermediaries, (iii) effectively weaken trade barriers, (iv) bundle the ordering of goods with efficient payment and delivery conduits, and (v) use idle assets to reduce production and distribution costs.

Like any “revolution,” digital transformation will create winners and losers. Specifically, digital platforms are a disruptive force in existing markets and to the incumbent players. Disruptive innovations are transforming business process, value chain structure, and employment arrangements. They are also a significant challenge for all market participants, particularly smaller businesses with fewer resources, as they adapt to new orders and changes. To cope with disruptive transformation, businesses need to better understand forces at work and form effective strategies and systems in a timely manner to continuously manage them.

This volume considers possible disruption in several areas:

Competition: There are ample merits for authorities to craft policies that encourage healthy competition and ease barriers to entry. They should also promote interoperability and sharing of data across platforms to encourage collaboration among market players and promote innovation for consumers' benefits.

Labor issues and social protection: As traditional labor conditions and arrangements may no longer be applicable to the jobs market that digital platforms create, online workers are typically categorized as contractors or self-employed. This leaves them with little job and income security, possible deterioration of working conditions, or uncertain social protection. Efforts are needed to strengthen employment protection for gig workers and strengthen social protections by making them digital, flexible, and portable.

Data access, privacy, and security: As the data value chain depends on data access, use, and sharing, substantial premium should be placed on regulations that foster greater transparency in using and sharing the collected data as well as in creating value from them. It is vital to uphold data privacy and at the same time ensure that access to data and information is secure. It is just as crucial to have safeguards against the use of data to discriminate against any specific group. Continuous cross-border policy coordination is equally important to ensure cybersecurity and fight cybercrimes.

Taxation: Taxing digital platforms and the activities within is a big challenge. There are regulatory gaps that make it difficult to identify taxable digital activities, especially as companies develop their businesses in a manner that does not necessarily entail having a physical presence within a specific tax jurisdiction, among many other issues. Preventing tax avoidance and evasion of national and multinational technology companies will ensure that benefits are fairly distributed both domestically and internationally.

The eight subsequent chapters in this volume deal with (i) defining digital platforms and measuring their aggregate economic contribution, (ii) assessing their benefits to other sectors and ensuring a more equitable distribution of these benefits, and (iii) identifying the areas of disruption and proposing measures to cope with these and mitigate adverse effects.

1.2. Measuring the Platform Economy: Concepts, Indicators, and Issues

Delineating the scope and features of digital platforms can lead to estimating their turnovers, purchases, employment costs, and marketing expenditures, as well as the use of online technologies by platform-enabled firms, in comparison with non-platform businesses. Many typologies are used in discussing platforms. They are either based on the type of interactions, roles, participation strategies, overall scope and structure, or profit motive. Nevertheless, it is challenging to have categories that are mutually exclusive given that some platforms, especially “superplatforms,” have features from several types. Furthermore, functional typologies get archaic as platforms evolve quickly, thus necessitates periodic adjustments in the typologies.

In Chapter 2, Albert presents possible approaches to obtaining data and indicators for measuring the digital platform economy using existing business and household surveys, dedicated surveys, and a process known as web-scraping. The chapter presents a case study of measurements of the platform economy in the Philippines using a household survey on the use of information and communication technology (ICT). It emphasizes that national statistics offices should incorporate various data sources into their national accounting system. For example, the household sector should not only be considered from the expenditure side, but also from the production side, given the rising incomes and production arising from their participation in platforms. Policy implications for the measurement of the digital platform economy in areas such as data privacy, competition, decent work and innovation policy, and taxation are also discussed in the chapter.

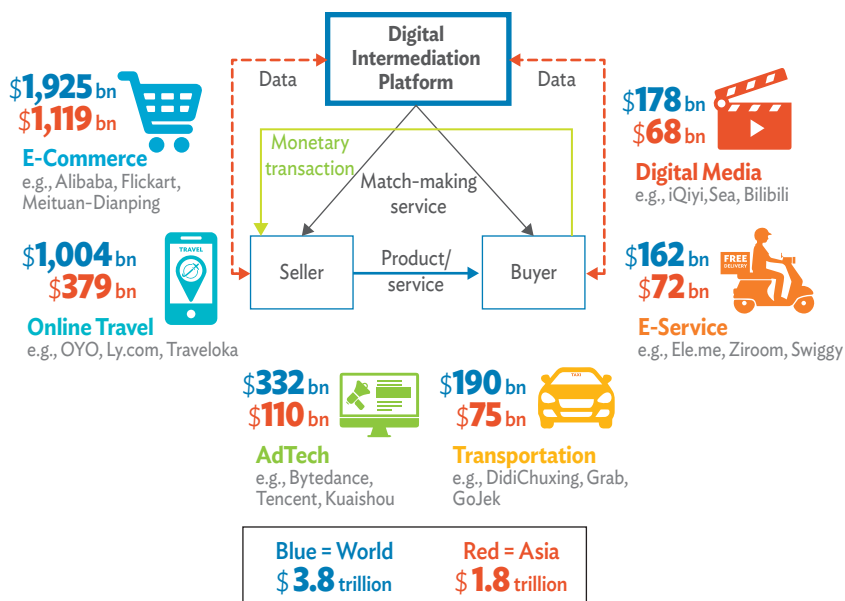
1.3. Digital Platforms, Technology, and Their Macroeconomic Impact

In Chapter 3, Villafuerte, Narayanan, and Abell present and analyze data showing the global reach of digital platforms. In 2019, digital platform business-to-consumer revenues reached \$3.8 trillion, equivalent to 4.4% of global gross domestic product (GDP). Asia and the Pacific accounted for about 48% (\$1.8 trillion; equivalent to 6% of regional GDP); the United States for 22% (\$836.7 billion; 3.9%); and the euro area 12% (\$445.3 billion; 3.3%). Within this region, the People’s Republic of China (PRC) is the biggest market for digital platforms, accounting for about \$1.2 trillion in revenue or

68.2% of Asia's total (about 8.8% of the country's GDP). Figure 1.3 shows the distribution of these revenues across the six major types of digital platforms: digital media, e-commerce, e-services, online travel, advertising technology, and transportation.

The digital economy in the region is expected to expand, providing opportunities to boost economic growth, create new businesses and jobs, and address various socioeconomic challenges. In order to estimate the impact on the macroeconomy of increased digital technology usage, the authors use a recursive-dynamic GDyn model developed by Ianchovichina and Walmsley (2012). The GDyn Model is the dynamic extension of the standard Global Trade Analysis Project (GTAP) model, a multi-region, and multi-sector Computable General Equilibrium (CGE) model. The dynamic CGE model used combines aspects of financial assets and associated income flows, capital accumulation, and investment theory.

Figure 1.3: Digital Platform Revenues, World and Asia, 2019



AdTech = advertising technology, bn = billion.

Note: Refer to Figure 8.4 in ADB (2021) for the country composition and the detailed sources.

Source: ADB (2021).

The dynamic CGE model is calibrated to represent the relevant changes during the COVID-19 outbreak. These include the shift to work from home, online education, and telehealth, as well as the increased patronage of e-commerce and reliance on digital media, among others. In particular, investment in the digital sector has increased, which in turn contributes to higher output of sectors that use digital inputs more intensively, raising overall economic productivity. The simulation results reveal that the size of the global digital sector is expected to rise by an average of about \$617 billion annually from the baseline levels, which total to \$3.1 trillion from 2021 to 2025. In comparison, Asia's digital sector size is forecast to increase by about \$184 billion per year from baselines, which translate to about \$919 billion in 5 years. This expansion will substantially impact economic growth, exports, and employment.

Globally, if the size of the digital sector expands by 20% by 2025 from the baseline, global GDP is estimated to increase by about \$4.3 trillion per year, which is roughly about 5.4% of the baseline 2020 GDP. Given this average annual gain, the total increase in global output will run up to \$21.4 trillion in 5 years. The increased size of the digital sector accounts for about a third of the GDP increase, while productivity enhancement accounts for the rest. Similarly, global trade is projected to increase by close to \$2.4 trillion annually to the baseline levels from 2021 to 2025, which represents about 5.5% of the 2020 baseline total trade. With this average markup, over \$11.8 trillion of additional trade value can be expected in the 5-year period to 2025.

Global employment will accordingly increase by almost 140 million jobs per year during the period, which is about 5.0% of the 2020 baseline global employment. Given this rate of expansion, the cumulative job generation will be about 698 million by the end of 2025.

Realizing potential gains from the growth of the digital economy, however, requires critical policy support and reforms in various areas. First, digital sector investments will have to increase substantially to provide a solid base that will support this projected expansion in digital sector output. Also crucial are better trade and logistics processes and infrastructure to address existing bottlenecks to goods delivery. Investing in digital skills and literacy of workers and the general population will also allow people's access to the economic opportunities of digital technologies and encourage their economic empowerment. Developing a digital, safe, and secure payment system is likewise critical. It is important to put together a robust, smart, and transparent regulatory system to prevent illegal activities, protect personal data, and strengthen cybersecurity.

1.4. Trade and E-Commerce in Asia: Policy Considerations

E-commerce—buying and selling of goods and services over the internet—comprises the bulk of transactions under the auspices of digital platforms. Global e-commerce sales to businesses and consumers are estimated to have breached \$25 trillion in 2018, or about 30% of GDP of the countries included in the assessment (UNCTAD 2020). The business-to-business segment accounts for about 83% of the sales, according to the report, and the rest by business to consumer sales.

In Chapter 4, Jacildo provides empirical evidence of the positive association between e-commerce development and consumer goods trade, with the linkage having strengthened in recent years. Poisson pseudo maximum likelihood estimations of gravity-model equations indicate that combined internet retailing activity of trading economies is positively and significantly associated with their bilateral consumer goods trade.

Cross-border e-commerce transactions highlight three important policy areas: (i) cross-border taxation, competition, and customs administration issues; (ii) the role of multilateral initiatives and trade agreements in resolving policy disconnects; and (iii) the responsiveness of free trade zone or economic processing zone strategies in light of the increasing role of platforms and other digital media in trade.

In this context, it is essential to strengthen official statistics for better monitoring of e-commerce development. Fostering e-commerce in line with the economic inclusion and development agenda also requires clear and targeted strategies to bolster the competitiveness of firms in the e-commerce space. Regional cooperation on cross-border taxation and related customs challenges is just as crucial. Similarly, multilateral and regional trade cooperation can help harmonize policies and regulations across economies to promote e-commerce and facilitate digital trade more broadly. Finally, free trade zone strategies can be revisited to support e-commerce development while facilitating compliance to customs regulations.

1.5. Retail Fintech Payments: Facts, Benefits, Challenges, and Policies

Financial technology (fintech) is the use of technology to support and deliver financial services and payment. In 2019, digital payments accounted for 77% of the global fintech transaction value; in Asia, it accounted for even more at 86%.

In Chapter 5, Huang examines the current fintech landscape, benefits, and challenges brought by retail fintech payment systems, and discusses policy options. Five stylized facts characterize the current fintech payments system:

- i. The relative importance—as measured by the average volume share—of card and e-money payments among cashless payment instruments is significant and rising in emerging economies.
- ii. The average value per transaction through card and e-money is substantially smaller than other cashless payments instruments.
- iii. Total mobile money transaction volume and value both increased substantially during 2011–2019.
- iv. Mobile money transaction volume is the highest for airtime top-up in general and relatively high for merchant payment in East Asia and the Pacific.
- v. The retail value of e-commerce is expanding exponentially, especially in Asia and the Pacific.

The study used the Alipay data in the PKU Digital Financial Inclusion Index of China data set covering 31 provinces from 2011 to 2018. Alipay, launched in 2004, is currently the dominant player in the payments space in the PRC. The econometric results show a strong relationship between e-commerce and fintech payments.

The study also provides evidence of the positive relationship between the adoption of fintech payments and transactions payment as well as remittances transfers. Fintech payments benefit from the unique characteristics of the platform economy in terms of big data, broad customer base, and multipurpose technology. They make retail payments more efficient, transparent, and inclusive, and act as an enabler for e-commerce, financial development, and financial inclusion.

As payment systems embrace new digital technologies and innovations to deliver more efficient and socially beneficial solutions, there is (need) to

address associated risks and challenges such as the divide in access to digital payments, data security and privacy, and competition issues emerging from big-tech payment platforms.

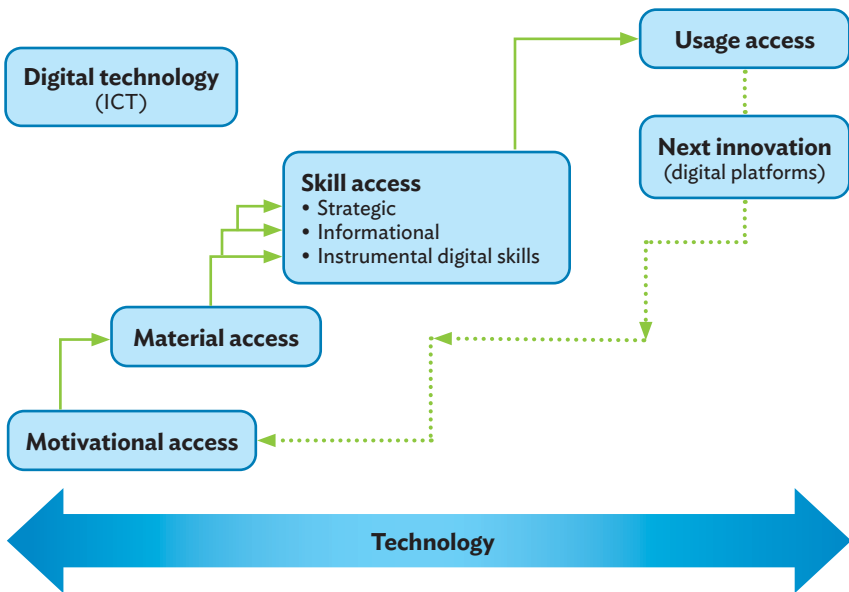
Policies can be generally categorized in line with the following goals: (i) close existing loopholes in the regulatory system to reflect critical changes brought about by digitalization; (ii) expand access, particularly for socially disadvantaged groups; and (iii) promote regional cooperation on regulation, competition, and taxation.

1.6. Digital Divide and the Platform Economy: Looking for the Connection from the Asian Experience

The benefits of the platform economy are not equitably distributed within and across countries. Gaps exist based on levels of income, education, gender, and geographic location. There are four kinds of barriers—the so-called divides—that relate to access: motivational or mental, material, skills, and usage (van Dijk 2006). In Chapter 6, Quimba, Rosellon, and Calizo Jr. present a model to explain the relationship between the digital divide and the platform economy, taking off from van Dijk's (2006) cumulative and recursive model (Figure 1.4). This model extends the basic concept of access—understood as material access or the counting of people with computers or access to internet connections—to include motivational access, skills access, materials access, and usage access.

Using data from a number of Asian economies, Chapter 6 shows that people who live in urban or more affluent areas, who are neither too old nor too young, mostly male, more skilled/educated, and who have high levels of trust, have better access to computers and the internet. Interestingly, the chapter shows that digital platforms also create inequalities. For instance, accommodation platforms have created a wider income gap between the more commercialized and touristy areas and the periphery. Capital platforms tend to increase income inequality. To address these inequalities caused by digital platforms, policy interventions should address not only material access but also the other forms of disparity.

Figure 1.4: Cumulative and Recursive Model of Successive Kinds of Access to Digital Technologies



ICT = information and communication technology.

Note: The figure is a slightly modified version of Figure 1 in van Dijk (2006).

Source: Quimba, Rosellon, and Calizo Jr. (2021).

Given its findings, the chapter recommends the following policy reforms:

- Define and measure various indicators in the four areas of access and participation in digital platforms.
- Address barriers to access simultaneously to maximize and distribute the gains from digital platforms.
- Support projects that would provide at least material access to ICT in developing economies.
- Work with governments to develop plans for utilizing digitization, to facilitate innovation, and to support start-ups in developing platforms based on mobile applications.
- Facilitate among countries to ensure the regulatory convergence of ICT access and participation in the platform economy, and to safeguard data privacy and maintain trust in the digital economy.
- Support digital skills development for youth.

1.7. Promoting Competition in the Digital Platform Economy

High concentration and the presence of dominant digital platforms are common features across the globe given the network effects. A number of platforms, such as Alibaba, Amazon, Apple, Facebook, Google, and TikTok, have already become household names given the size of their markets. Of interest to competition policy is the manner by which market leaders are expanding their businesses. Leveraging their dominant position in one market to establish themselves in adjacent markets, sometimes to the detriment of competitors, is seemingly the trend. Markets in developing economies, such as those in Southeast Asia, exhibit this pattern of high concentration. Evidently, an assessment of Southeast Asia's e-commerce market in 2019 covering Indonesia, Malaysia, the Philippines, Singapore, and Viet Nam shows that Lazada and Shopee, which are the two leading firms, account for more than 55% of visits to the top 10 e-commerce websites (Iprice Group, App Annie, and SimilarWeb 2020).

Evans and Schmalensee (2007) posit that five factors exert strong influence market on the level of concentration in digital platform markets. These are congestion, network effects, platform differentiation, scale economies, and “multi-homing.” Indirect network effects and scale economies are suggested to lead to higher concentration, whereas the other three are purported to have the opposite influence. The collection and use of big data is another prominent issue. Data can be utilized to ward off competitors. In some cases, data transferability is a material determinant of switching costs, stifling competition.

Figure 1.5 summarizes these factors in comparison with the ones considered by Libre, Jacildo, Diet, and Elvina in Chapter 7.

The chapter discusses the characteristics of digital platforms that significantly influence distribution of market power and identifies key areas for policy reforms.

- Instead of penalizing dominance and artificially creating a fragmented but inefficient market, *ex ante* policies that ensure contestability may be more appropriate.

Figure 1.5: Market Characteristics That Could Stifle Competition



Network effects: Value of the platform is positively correlated with the number of users.



Extreme returns to scale: Returns of producing digital goods and services are, in time, very large compared to its cost of production.



Data intensiveness: Perhaps the most important by-product of using digital platforms is the amount of data captured, e.g., targeted recommendations, behavioral nudges.



Switching costs: Real or perceived costs incurred by a consumer when changing suppliers for similar goods or services.

Source: Bernabe (2020).

- One way to ensure contestability is through “multi-homing” or by restricting exclusivity arrangements. Multi-homing means that users can join and use multiple platforms at minimal switching costs.
- Interoperability is a tool that can also promote and facilitate multi-homing. Interoperability pertains to the ease with which one system or platform integrates with another in access, exchange, and use of data.

In general, the growing market power of dominant digital platforms calls for more responsive rules on mergers and acquisitions, stronger *ex-ante* anti-trust regulations and mechanisms, and more vigorous cooperation between governments on cross-border issues to ensure that rules are complementary and consistent with each other.

1.8. Digitalization of Work and the Role of Universal Basic Income in Developing Asia

The emergence of labor platforms is changing the nature of work and employment enabled by these platforms. The jobs generated through digital service platforms are categorized into either cloud work or gig work, depending on whether the services and tasks are bound to a specific location or person. While many of these jobs are characterized by flexibility in terms of the number of work engagements and work schedule, income is sometimes not guaranteed and neither is social security.

The platform-based gig workers may be exposed to vulnerable labor conditions in the absence of legal protections such as a minimum wage, work safety, pension contribution, and health insurance. Many of them are considered self-employed or own-account workers as well, while work informality is highly present among the self-employed or own-account workers—86.2% of the region's self-employed are informal workers (ILO 2018).

These gig workers are similar to other informal workers in the sense that they usually lack coverage from social insurance or contributory schemes. Among other reasons are the exclusion from legal coverage, low and inconsistent earnings, and complicated administrative processes. They also tend to be excluded from social assistance or noncontributory schemes that are typically intended for the poor. Informal workers are often left without any social protection coverage, hence, the case of the “missing middle” exists (ILO 2017, 2019; Ulrichs 2016).

In this context, economies like the PRC and India have been examining the feasibility of a universal basic income (UBI). UBI is a social assistance mechanism that involves regular and unconditional transfer of uniform cash amounts to all individuals in a given country. This is particularly relevant to workers in the growing gig and platform economy. Although critics argue that UBI can disincentivize work, increase inflationary pressures, and add to the fiscal burden, it has potential to eliminate huge administrative costs and the inclusion or exclusion errors that are associated with targeted social assistance schemes.

In Chapter 8, Arbo and Kikkawa argue that UBI's potential impacts and feasibility depend on the program design, performance of existing social protection schemes, fiscal cost, and financing. A UBI can be considered

to improve coverage and adequacy of social security benefits and broaden social protection systems subject to the assessments of the country-specific conditions. The following are identifiable trade-offs when comparing UBI with other social protection programs:

- When social assistance has substantial coverage and slight progressivity, barriers to access, eligibility and coverage, and delivery should be carefully studied and addressed. A UBI may be better motivated by various objectives under a comprehensive framework for social equity and social protection system than simply focusing on poverty reduction.
- When social assistance has high coverage but is not progressive, a UBI may be feasible, especially if it is difficult to improve progressivity within the existing programs; however, UBI should be combined with progressive financing.
- When social assistance has low coverage but is progressive, a UBI may extend coverage but also flatten the distribution, especially if budget-neutral. Hence, a more generous UBI design is preferable to ensure adequacy of benefits particularly at the bottom of the income distribution.

1.9. Digital Platforms and International Taxation in Asia

The emerging digital economy have new features that have implications for tax systems. These include (i) the mobility of intangibles and platform players, (ii) the increasing reliance on data and other intangible assets, (iii) the network effects, (iv) the spread of multisided business models, (v) the tendency toward monopoly or oligopoly in a digital economy, and (vi) the volatility that accompanies the low barriers to entry owing to technological advances (OECD 2015). In Chapter 9, Avendano and Rosenkranz argue that these features not only pose challenges to national tax systems but may also exacerbate concerns over Base Erosion and Profit Shifting (BEPS) practices.

The ongoing evolution of the digital economy presents challenges for tax systems, broadly in terms of the reduced need for physical presence (nexus), the growing utilization of data, and the uncertainties surrounding the accurate measurement of business income. The digital economy poses three main challenges: (i) the ability of digital businesses to operate in an

area without a physical presence entails a review of the rules on physical presence (nexus rules), (ii) the extensive use and monetization of data requires examination of the economic value this generates and whether it is appropriately captured for tax purposes, and (iii) new business models such as cloud computing present difficulties in properly characterizing income for tax purposes (OECD 2015).

Meanwhile, the COVID-19 pandemic has substantially changed the digital economic landscape and has accelerated the adoption and use of digital technology and reorganization of business activities online and offline. Such changes complicate identification of taxable incomes and taxpayers creating possible tax leakages and loopholes. While several Asian economies have joined efforts to reach a global solution addressing BEPS and facilitating exchange of information, a strong and coordinated regional and international response is needed to ensure implementation of coordinated tax policies to stop tax evasion while avoiding costly unilateral measures. This will strengthen efforts to mobilize domestic resources to manage and control public debt in the aftermath of the COVID-19 pandemic.

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