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Towards Measuring the Platform Economy: Concepts, Indicators, and Issues

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Abstract

As digital platforms provide consumers opportunities to interact with suppliers of goods and services through the internet, these platforms have radically transformed business activities as well as the nature of work. The disruptions from the novel corona virus pandemic also show how platforms enable people to cope with disruptions, and to increasingly produce goods and services themselves in some sectors such as transportation services, food and accommodation, and culture and recreational industries. These platforms provide intermediary and sometimes financial services, either implicitly or explicitly, and it is important for policy makers, businesses, and people, in general, have a better sense of the platform economy. National statistical systems, however, hardly give a clear and integrated portrait of the role, nature and size of the platform economy in large part because of measurement issues. In this paper, we define platforms, typologies and related definitions and classifications, describe drivers of value creation and capture in platforms, and discuss policy implications. These frameworks can lead to estimating the turnover, purchases, employment costs and marketing expenditures of platforms (especially those in the sharing economy), as well as the use of online technologies by platform-enabled firms, in comparison with non-platform businesses. We also discuss major challenges in data collection, arising from the cross-border nature of platforms, and the complex activities of platforms. We describe possible approaches for obtaining data and indicators for measuring the (digital) platform economy using existing business and household surveys (especially on ICT use), dedicated surveys, and web-scraping (complemented by ad hoc methods using site usage data). We also discuss albeit briefly some policy implications for the measurement of the platform economy (and the wider digital economy) especially as measurements will allow policy makers, businesses and the public, in general, to better understand the socioeconomic implications of increasing digitalization and the rise of the platform economy.

Keywords: digital platforms, platform economy, sharing economy, digital economy, data, indicators

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Towards measuring the platform economy: Concepts, indicators, and issues[*]

Jose Ramon G. Albert[**]

1. Introduction

In recent decades, the rapidly increasing diffusion of digital technology into social and economic activities, known as "digitalization," has been transforming national, regional and the global economies, including the nature of work (World Bank 2019). Aside from the growing deluge of digital data, a major driver of the emerging digitalization is the increasing use of the internet. According to the International Telecommunications Union (ITU), as of the end of 2019, more than half (53.6%) of the global population (corresponding to 4.1 billion of the world's 7.6 billion inhabitants) are using the internet. The global internet penetration rate in 2019 is a considerable escalation from 2005, when only less than a fifth (16.8%) of the population had access to the net (ITU 2019). However, past and current data also suggest a persisting digital divide that if unchecked can further exacerbate inequalities of opportunities and of outcomes. These inequalities have undoubtedly contributed to the normal conditions prior to COVID-19 that has made it challenging for the world to manage the effects of the pandemic.

Concomitant to improved internet use and increased digitalization (including the growth of digital footprints) is the rise of the platform economy, i.e. a growing number of socio-economic activities involving online intermediaries which provide a mechanism for customers and suppliers of goods and services to interact and transact (Kenney and Zysman 2016). Online platforms, which facilitates interactions and transactions of different groups and individuals, are becoming a primary mechanism of organizing a vast set of human activities, including economic, socio-cultural, and political interaction. They may be v iewed as online digital arrangements with algorithms organizing and structuring economic, socio-cultural and political activity.

Platforms manifest in different forms, by purpose and size (OECD 2019). In the Philippines, where citizens are very active on social media, (digital or online) platforms such as Facebook, YouTube, Instagram, Google+, Twitter, Skype, Viber, LinkedIn, Pinterest, Snapchat and WhatsApp are used by netizens to communicate with their social networks. The Facebook

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platform, aside from enabling the sharing of digital media content, also offers a marketplace that competes with e-commerce platforms, of which, popular examples in the Philippines include Lazada, Shopee and Zalora. Aside from social media and e-commerce platforms mentioned, other popular online platforms in the Philippines include Google (search engine); Grab, Lalamove and *Angkas* (for ride-sharing or logistics services); Netflix (for media-streaming); Airbnb (accommodation services); CrowdFlowers and Microworkers (for crowdwork) and Zoom and Webex (for video conferencing, online meetings and group messaging).

The emergence of online platforms, also called digital platforms, (hereafter simply: platforms) is shifting competition towards platform-centric ecosystems in any economy. Platforms are putting forward new (market) possibilities to businesses and job-seekers, as well as benefits to consumers, enabling 'innovative forms of production, consumption, collaboration and sharing through digital interactions' (OECD, 2018, p. 7). The huge disruptions caused in economic activities by the novel coronavirus (COVID-19) pandemic have provided people a means to cope with these disruptions, and businesses an opportunity to stay ahead of others that have not undergone a digital transformation.

As of 2018, the total market size of companies in the global platform economy is estimated at $7.2 trillion (Dutch Transformation Forum 2018), up from an estimated $ 4.3 trillion two years earlier (Evans and Gawer 2016). About half (46%) of the platform companies with a value of +$1 billion are based in the US, while a third (35%) are based in Asia, mostly in the People's Republic of China (PRC). These platform companies have a strong presence in four sectors, viz., Internet Software & Services, Ecommerce & Retail, Social and Search, though in recent years, platform companies have also shifted focus to a variety of other sectors. Platform companies are highly concentrated around seven 'Super platforms' (that have a combined market value of over $ 250 billion): US-based Apple, Amazon, Microsoft, Google, Facebook and the PRC-based Alibaba and Tencent, which together have an aggregate market value of $4.9 trillion (or 69% of the total market value of the 242 platform companies).

About eight decades ago, Joseph Schumpeter predicted that competition from "the new commodity, the new technology, the new source of supply, the new type of organization" (Schumpeter 1943, p. 84) would be more relevant than perfect competition. He described this as competition which "strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives" (Schumpeter 1943, p.84). His prophecy has certainly come true with platforms getting more and more integrated with businesses and the economy as a whole.

The importance of platforms in today's business environment is indicated by the fact that seven of the top eight companies across the world by market capitalization use platform-based business models (UN 2019). The rise of platforms has brought about a host of positive economic outcomes. Platforms reduce inefficiencies in markets, create new markets, as well as bring more choice, products and services to consumers (often at a lower cost), and a flexible income to platform workers. Thus, platforms have driven up productivity through highly efficient matching of buyers and sellers in e-commerce (which corresponds to goods and

services sold and bought online). Platforms also create a lot of social good. E-bay, Facebook, Instagram and Google, together with leading animal welfare charities. have cooperated to reduce the black-market trade for prohibited products such as ivory and rhino horn (Bale 2018). Platforms, however, are also causing major disruptions in doing business: radically changing all elements of the value chain including product design, supply chain, manufacturing and customer experience, while creating new business models. But while these disruptions can lead to a lot of advantages in the economic, platforms can also be putting pressure on fair competition, causing privacy issues and making it more difficult for governments to raise taxes (especially given cross-border transactions of platforms).

In the advent of the effects of the COVID-19 virus and the responses to contain the virus that have yielded reduced economic activities, some platforms, such as Zoom, Webex, Skype, to name a few, have also provided opportunities for people to meet in digital space through online meetings, and webinars. These also have become mechanisms for online learning. Facebook and Google have themselves offered video conferencing thru Facebook Messenger Rooms and Google Meet, respectively.

On the negative scale, platforms have ushered in extensive personal data extraction, privacy breaches, and internet addiction issues to consumers; winner-take-all monopolies for the big companies and income insecurity for contracted, pay-per-piece employees; and decreased social cohesion from social media echo chambers and fake news that propagate easily. Thus, while creating new business models, platforms have also been disrupting entire industries at scale, causing more vulnerability, uncertainty, complexity, and ambiguity (VUCA)[1].

This study aims to describe various concepts on the platform economy, based on an examination of past studies, and enriched by results of interviews with some key informants. It proposes a framework toward measurement of the platform economy, describes some key indicators from a household survey on internet use in the Philippines, as well as discusses policy implications. Some research questions that the study intends to answer include: (i) What exactly do we mean by the platform economy and related terminology, and what key indicators can be used to measure economic activities of online platforms? (ii) What are key drivers of value creation and capture in the platform economy ? (iii) What policy responses can facilitate and stir value creation and capture, and ensure an inclusive transformation from the growth of the platform economy? To answer these research questions, this paper is organized as follows: the next section depicts the context of the platform economy, i.e. digitalization. This section also discusses issues pertaining to measurements of the wider digital economy. The third section then describes challenges and solutions to measurements of the platform economy. The discussion also includes a definition and typology of platforms that identifies the main characteristics of digital platforms, a listing of requisite data and indicators for describing platforms, and possible data sources for the needed indicators. The fourth section provides a summary of key issues and some policy implications.

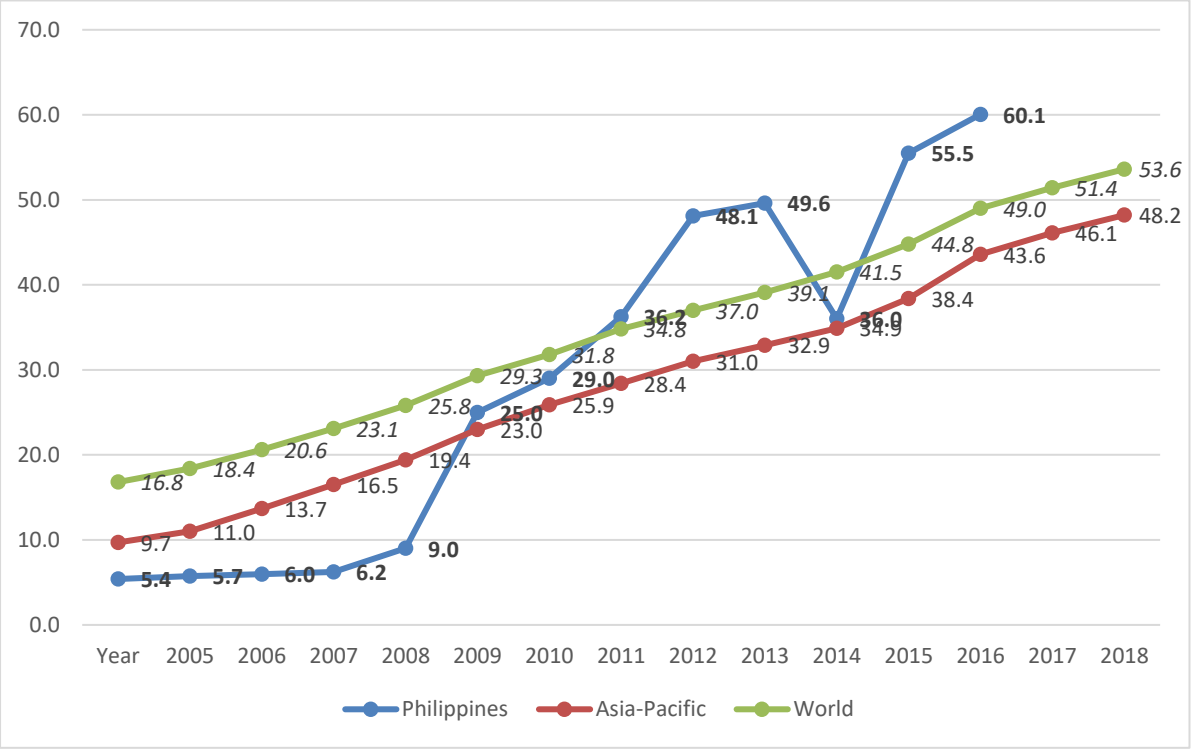
[1] http://usawc.libanswers.com/faq/84869

2. Digitalization, the Digital Economy and the Platform Economy

Undoubtedly, economies, whether at the national, regional and global level, are undergoing digitalization, i.e., a transformation due to the evolution and growing use of information and communications technology (ICT). The latter include electronic tools, systems, devices and resources on telecommunications, audio-visuals and storage that generate, store or process data. Digitalization may also be viewed as the "incorporation of data and the Internet into production processes and products, new forms of household and government consumption, fixed-capital formation, cross-border flows, and finance" (IMF 2018, p.6).

While the pace of digitalization varies, all countries are being affected, and these trends in transformation are reflected in the massive growth of digital data that provide business intelligence as well as opportunities for addressing data gaps needed in development policy (Albert and Martinez 2019; Martinez and Albert 2018). Further, we can readily observe the increased use of the internet over time as well as varying levels of internet penetration across countries (reflecting the level of economic development), aside from the variegated paces of improvements across time. In Asia-Pacific, the proportion of individuals using the internet, as of 2019, is estimated by ITU at slightly less than half (48.2%) of the region's population, a significantly increase from about a tenth (9.7%) in 2015 (**Figure 1**). But this also reflects the digital divide: as half of people in the region have not yet made use of the internet. In the Philippines, the internet penetration rate is estimated by ITU at 60.1%, as of 2017, even higher than the global and Asia-Pacific averages, despite the country having lower internet penetration (than the global and regional averages) prior to 2011.

Figure 1. Proportion (in %) of Persons Using the Internet: 2005-2018



Source: ITU

According to We Are Social and Hootsuite (2020), the internet penetration rate in the Philippines stands at 67%, as of beginning of 2020. Further, the Philippines leads countries across the world in the amount of time spent online (9 hours and 45 minutes). The bulk of that time is spent on social media, averaging nearly 4 hours. Further, the estimated number of social media users in the Philippines was 73 million (out of the 108.8 million estimated population).

Alongside the growth of internet penetration is the huge increase of the global internet protocol traffic, a proxy for data flows (from 100 GB per second in 1992 to 46,600 GB per second in 2017. As reported by the United Nations Conference on Trade and Development (UNCTAD), global IP traffic is projected to reach 150,700 GB per second by 2022, with more people are expected to make use of the internet and with the Internet of Things (IoT) expected to expand in the years to come (UN 2019).

One of the main components of the digital economy, especially the platform economy, is e-commerce. According to UNCTAD (UN 2019), global e-commerce is valued at $29.4 trillion in 2017, with business-to-business (B2B) e-commerce representing 87 per cent of total e-commerce. Of the $25.6 trillion B2B e-commerce in 2017, the US ($8.1 trillion) takes the lion's share, followed by Japan ($ 2.8 trillion), Germany ($1.4 trillion), the Republic of Korea ($1.2 trillion), the PRC ($ 0.9 trillion). In 2017, over $100 billion business-to-consumer (B2C) e-commerce sales were reported in the PRC ($1.1 trillion), the US ($753 billion), the United Kingdom ($206 billion), and Japan ($147 billion). E-commerce also includes transactions through platforms, such as those engaged in ride-hailing and accommodations-sharing.

UNCTAD also reports that a quarter of the global population aged 15 years and older (totaling about 1.3 billion people) has shopped online in 2017, with the PRC having the largest number of online shoppers (440 million) across countries (UN 2019). The growth of e-commerce and the platform economy, particularly some platforms, is partly attributed to network effects, i.e., more users on a platform making the platform more valuable. So, for example, a social media platform such as Facebook, gains value only if someone uses it, and with more users in the social media platform, the more value that the platform has. Further, more users of a platform would mean more data: if the platform company knows how to leverage these data, it can improve its competitive advantage. Finally, given traction, the platform can start offering different integrated services, thereby making its platform users further make use of the platform. In the case of the PRC, for instance, its WeChat platform has, as of 2017, more than a billion active users and, together with Alipay (Alibaba), its payment solution, has practically the whole Chinese market for mobile payments. Thus, it is not surprising that in 2017, Alibaba has nearly 60 per cent of the Chinese e-commerce market.

The e-commerce market, however, does not solely depend on the extent of internet users. There may be issues of trust about digital transactions in some societies, as suggested by the dominance of "cash is best" paradigms particularly in payments. In the Philippines, for instance, cash accounts for practically all local financial transactions as of 2018[2]. This may be

[2] https://business.inquirer.net/243515/bsp-goal-20-of-ph-transactions-digital-by-2020

the reason why prior to the onset of COVID-19, e-commerce has not taken as much root in the country. According to Statista (2019), total digital revenues in the Philippines are at US$6.4B in 2019, but more than seven tenths of this (amounting to US$4.5B) pertains to online travel purchases. Across Asia, digital spending is about a tenth (10.7%) of per capita consumer expenditure, the corresponding share in the Philippines is only 2.3%. Outside of e-travel spending, a quarter of total e-commerce spending goes to fashion and beauty, and another quarter to electronics, while one eighth share each goes to (a) food & personal care; (b) furniture & appliances; (c) toys ; (d) video games. The report of Statista (2019) is validated by data from the Philippine Statistics Authority (PSA) which suggests that transportation and storage accounted for 70.9 per cent of total turnover from B2C e-commerce (valued at PHP44.4 billion[3]) in 2015, most likely from online purchases of travel services (PSA 2017). The PSA (2017) also reports that accommodation and food services had the second largest source of e-commerce revenue in the country, and clearly, this e-commerce activity in this sub-sector is also connected to travel-related activities and food ordering. Meanwhile, the wholesale and retail trade sub-sector had 5.9 per cent of e-commerce sales in 2015, according to the PSA (2017). The e-commerce market in the Philippines is still small. According to Statista (2019), the Philippines has garnered the lowest average revenue per ecommerce user across countries in 2018. Removing online travel, the average Filipino e-commerce shopper spent merely US$18 in 2018 on online consumer goods purchases.

We Are Social and Hootsuite (2020), the bulk of Filipino users of social media platforms, most especially Instagram are female and among young tech-savvy aged 18-24 (in the so-called "Gen Z"[4]). In consequence, this group has become the main target for advertisements and marketing campaigns. In 2019, Instagram was the most popular online platform channel used by beauty influencers in the Philippines. Furthermore, based on data from App Annie, fashion is a top choice for mobile shoppers in the Philippines, with Zalora ranking as 3rd most-used app in the country during the first quarter 2019. Beauty is another popular category for mobile shoppers, with local platform BeautyMNL and global powerhouse Sephora both ranking in the PH's top 10 mobile shopping platforms. Thus, we see here particularly how digital footprints have been transformed into business intelligence in e-commerce.

While the platform economy is growing fast, it is currently outside the radar of most national statistics offices (NSOs), including the PSA, given the absence of a commonly accepted definition of the term "platform." Even the broader "digital economy" is also not commonly measured by countries due to absence of definitions of what comprises the "digital sector", also called the Information Technology (IT) sector or "ICT sector".

According to UNCTAD, in its Digital Economy Report (UN 2019), the entire digital economy is less than 10% for most economies in recent years, whether if measured by valued added, or employment. The same report pointed out how definitions matter: estimates of the global

[3] https://psa.gov.ph/content/2015-annual-survey-philippine-business-and-industry-aspbi-economy-wide-establishment-total

[4] https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/

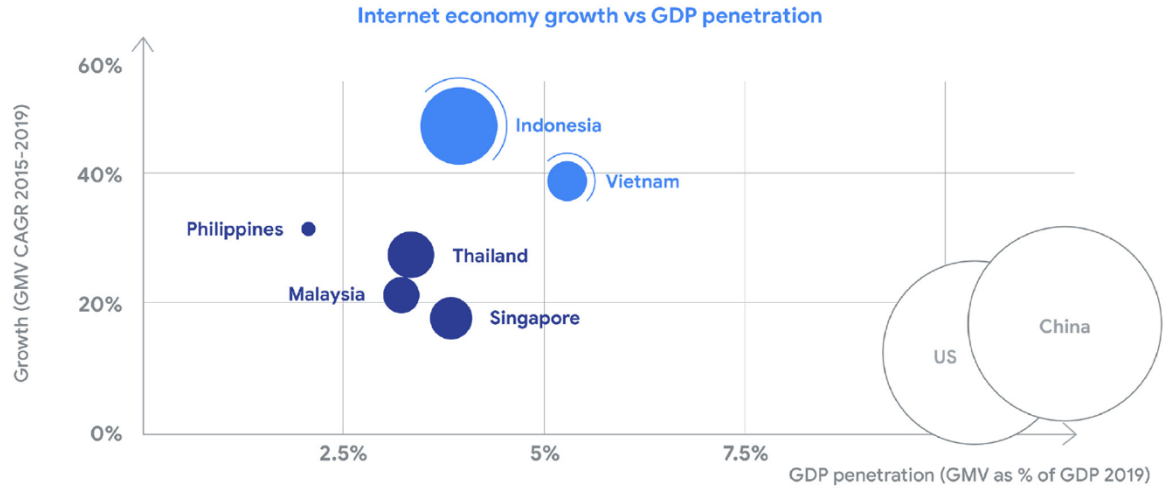
digital economy can range from a 4.5% of world's GDP (using a narrow definition) to 15.5% of GDP (using a broad definition) based on 67 economies (15 of these in Asia-Pacific). Of these 67 economies, eight of the top ten economies with the largest shares of ICT Manufacturing GVA in proportion to GDP are in Asia-Pacific, led by Taipei,China, followed by the Republic of Korea, Singapore, Malaysia, the Philippines, Thailand, the People's Republic of China and Japan. From 2013 to 2015, the ICT sector value added in the Philippines has been estimated to be in the range of 3.2 to 4.5 percent of GDP. Further, employment share of the ICT sector is at 1.0 percent of total employment, as of 2015.

As of 2018, e-commerce has been estimated in the Philippines at 9.5% of GDP (Digital Filipino and I-Metrics, 2018). This figure is based on the E-Commerce Index (ECI), a supply side estimation of e-commerce engagement of firms that participate in the Purchasing Managers Index (PMIG). The PMI is a composite index of economic activities based on interviews of a randomly selected panel of supply chain executives from private sector companies.

The Hinrich Foundation (2019) estimates the value of digital trade-enabled benefits to the Philippines at ₱160 billion (US$3.2 billion). Digital trade pertains to cross-border data flows, i.e. the exchange of data across national borders that create economic value. If digital trade is fully-leveraged in the Philippines, its value could grow by nearly 12-times to ₱1.9 trillion (US$37 billion) by 2030. Further, digital exports are valued at ₱187 billion (US$3.7 billion), representing 5.4 percent of the country's total export value, and are expected to grow to as much as ₱594 billion (US$11.8 billion) by 2030. Currently, digital exports in the Philippines are largely driven by the Information Technology-Business Process Outsourcing (IT-BPO) firms.

In its latest e-conomy SEA 2019 report, Google, Temasek and Bain & Co. (2019) estimate that the internet economy contributes 2.1% of GDP in the Philippines, with the internet economy valued at $ 2.5 billion, and growing between 20% and 30% annually since 2015. Compared to neighboring countries in the Association of South East Asian Nations (ASEAN), both the GDP penetration and the growth of the internet economy in the period 2015 to 2019 of the Philippines are much lower (**Figure 2**), thus providing the country potential for higher impact.

Figure 2. Growth (in %) in Internet Economy (from 2015 to 2019) vs GDP Penetration Among Select South East Asian Countries



Source: Google, Temasek and Bain & Co. (2019)

According to the report of Google, Temasek and Bain & Co. (2019), the Philippines has grown remarkably in the Online Media sector (comprising Advertising, Gaming, Subscription Music and Video on Demand), at an annualized rate of 42% per year from 2015 to 2019. Aside from Online Media Sector, four other sectors, viz., Online Travel (Flights, Hotels, Vacation Rentals); Ride Hailing (Transport, Food Delivery); e-Commerce; and Digital Financial Services (Payments, Remittance, Lending, Investment, Insurance) comprise the internet economy in this report. Further, across (six economies of) South-East Asia (comprising Indonesia, Singapore, Malaysia, Philippines, Thailand and Viet Nam), the internet economy has an overall GDP penetration of 3.7%. Annual per capita spending for the internet economy in Metro Manila ($273) is seven times that of outside the Metro ($39).

In the entire South East Asia, the gross merchandise value (GMV) of the internet economy is valued at $100 billion in 2019, and the internet economy's GMV is expected to triple by 2025 (Google, Temasek and Bain & Co. 2019). Half of the South East Asia's 360 million internet users engage in the internet economy, which has tripled from 1.3% of GDP in 2015 to 3.7% in 2019. Further, e-commerce and ride hailing across South East Asia have undergone rapid growth with shifts in consumer behavior. Growth in ride hailing has been propelled especially in recent years especially by food delivery services, aside from financial services and loyalty and rewards programs, while e-commerce growth has been driven by online shopping festivals, in-app entertainment, seller development, next-day delivery and monetization. Online media has been led by ads and gaming, while vacation rentals and budget hotels have been the most dynamic part of the Online Travel sector.

The varying estimates on the value of the internet economy (UN 2019; Hinrich Foundation 2019; Google-Temasek-Bain & Company 2019; Digital Filipino and I-Metrics 2018) are due to differences in statistical frameworks, coverage and data sources. The data ecosystem has expanded considerably beyond national statistical systems, especially in the wake of digital data (Albert *et al.* 2019). Data producers outside of government make use of various data

sources, from new surveys to ad hoc methods, e.g., web scraping of site usage, to measure the economic performance of platforms, whether as part of the larger digital economy, or a portion of the platform economy, such as the sharing economy. The direction and extent of bias in the use of these methods, however is unknown and has not been specifically investigated. In the next section, we discuss how the platform economy can be measured comparably through a sound and robust statistical framework, especially as these measurements. when available, can help in assessing the impact that digitalization is having on a country and society at large, and across countries. We illustrate some results in the Philippines using a household survey on internet use, recently conducted by the Department of Information and Communications Technology (DICT), in cooperation with the Philippine Statistical Research and Training Institute (PSRTI).

3. Measuring the Platform Economy

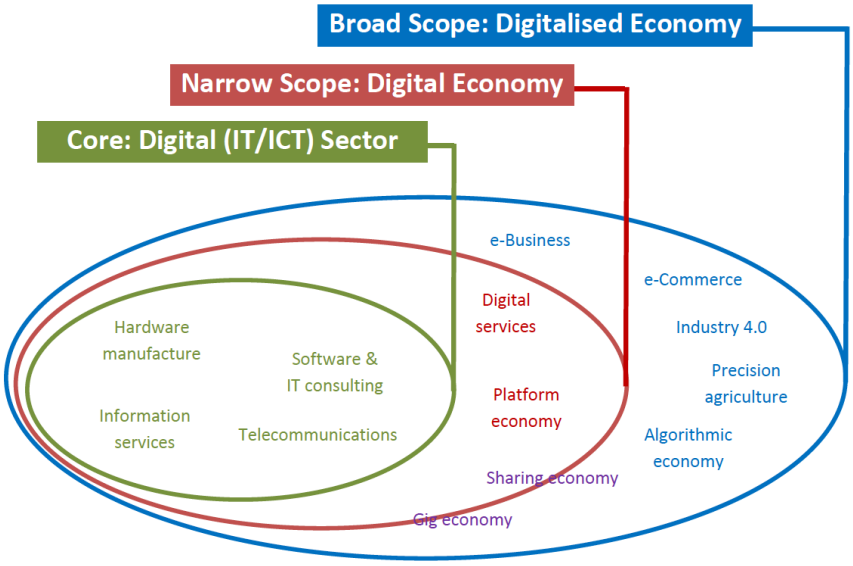
The measurement of digital products and transactions, especially activities in platforms, should be tracked by governments as they could improve the accuracy of various economic and financial statistics, e.g., inflation, value-added, employment, and productivity (IMF 2018). Measurements are helpful for the policy environment, especially as policies and regulations to keep up with the rapid digitalization that can either produce more wealth, or increase currently existing inequalities.

Hitherto, the platform economy is currently outside the radar of most NSOs throughout the world. This is because of the absence of commonly accepted definition of a "platform", aside from various measurement issues. Even the broader "digital economy" is not commonly measured by NSOs due to absence of definitions of what comprises the "digital sector" (UN 2019), and even moreso, what we mean by platforms and the platform economy. Further complications in the valuation of the platform economy include the wide variety of types of platforms, and the fact that many platforms offer (parts) of their services for free.

In 2016 the OECD conducted a survey of NSOs regarding national accounts compilation practices, and a year later, the IMF extended the OECD survey to NSOs of non-OECD countries; results of both surveys suggested that the digital sector is hardly measured, either because of data issues, or the lack of resources to do so (IMF 2018). Malaysia's Department of Statistics was considered then an exception, as it was then developing an ICT satellite account that included platforms. Last October 2019, the Philippines made public its plans to develop an ICT satellite account with the support of the World Bank (Ilarina *et al.* 2019; World Bank 2020).

As pointed out in Bukht and Heeks (2017), the digital economy has core, narrow and broad scopes (**Figure 3**). The core and narrow scopes relate to the ICT producing sector; they comprise various digital services (e.g., business processing outsourcing services) as well as platform economy services (e.g., Facebook and Google). The broad scope involves the use of various digital technologies for performing activities such as e-business, e-commerce, automation and artificial intelligence (AI), as well as the sharing economy and the gig economy.

Figure 3. Three Dimensions of Digital Transactions.



Source: Bukht and Heeks (2017)

Rather than identifying the digital sector, an alternative approach to defining the digital economy is to examine digital transactions. The OECD advisory expert groups on a digital economy satellite account in national accounts and on digital trade in balance of payments statistics take this approach. Fortanier and Matei (2017) suggested possible criteria for distinguishing digital transactions:

(i) the nature of the transaction: how the transaction is made (digitally ordered, enabled or delivered),

(ii) the product: what is transacted (goods, services or data), and

(iii) the partners or actor in the transaction: who is involved (consumer, business or government).

Thus, a working definition of digital transactions includes those that are digitally-ordered, digitally-delivered, or platform-enabled, and this definition is related, though not equivalent to the OECD definition of e-commerce[5], which emphasizes digitally-ordered transactions. In this approach, a crucial issue is to obtain price data of digital products for estimating volume measures given the rapidly quality changes of products.

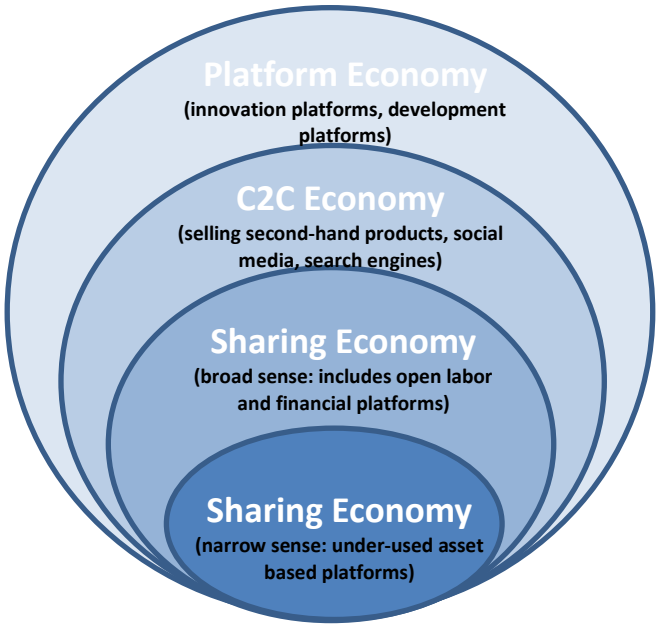
[5] According to OECD (2011, p.72), an e-commerce transaction is "the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The goods or services are ordered by those methods, but the payment and the ultimate delivery of the goods or services do not have to be conducted online. An e-commerce transaction can be between enterprises, households, individuals, governments, and other public or private organizations. To be included are orders made over the web, extranet or electronic data interchange. The type is defined by the method of placing the order. To be excluded are orders made by telephone calls, fax or manually typed e-mail."

UNCTAD (UN 2019) provides estimates of the digital economy using a definition of the digital economy, suggested by Bukht and Heeks (2017), as the part of economic output derived from digital technologies with a business model based on digital goods and services. The same report points out that New Zealand; Malaysia; and Hong Kong, China are currently the only economies in Asia-Pacific among ten economies globally, which compile data on the digital sector through ICT satellite accounts or through aggregation of the appropriate International Standard Industrial Classification (ISIC) codes.

Quite often the platform economy (which pertains to activities in business, politics and social interaction powered by platforms, see, for instance, Kenney and Zysman 2016) is not separated from the wider digital (also called internet) economy, which involves anything powered by digital technologies (see, e.g., Bukht and Heeks 2017), or other new economy models. The latter include the sharing economy (which focus on the sharing of under-utilized assets such as accommodations and rides, see, for instance, Botsman and Rogers 2010; Sundararajan 2016; Cheng *et al.* 2018) and the gig economy (which pertains to labor participation and income generation via "gigs", i.e., single projects or tasks for which a worker is hired, see, e.g., Friedman 2014; or Berg *et al.* 2018).

There are no widely accepted definitions of the digital sector, the platform economy and other new economy models. The sharing economy, for instance, could have a broad definition, to include the supply of work for small jobs in open labor platforms as well as crowd funding in financial platforms, or a narrow definition (Eurostat 2018) to include only the supply of underused assets (**Figure 4**). These terms, platform economy, sharing economy and digital economy can cover a spectrum, with different shades of black and white, nonetheless we can identify characteristics of platforms, and from which, unpack and define these terms, as well as look into various typologies toward a measurement scheme.

Figure 4. Various Senses of the Platform Economy



3.1. Defining Platforms

In measuring the platform economy, the first step is to define platforms. The literature provides various though inter-related definitions of a platform (**Box 1)**. In this report, we define a platform as a **digital intermediary and infrastructure that brings together various parties through the internet to interact, thereby matching supply and demand in a multi-sided market**. In short, platforms are digital matchmakers; they provide a mechanism for consumers and suppliers of products and services to perform various economic activities, including information exchange, demand matching, payment and receipt and delivery of goods and services. Platforms do not only match providers and users, but also facilitate likely transactions resulting from interactions; they differ in their role and the "products" they "exchange".

Box 1. Selected Definitions of Platform

Source	Definition
OECD 2019, p.20	digital services that facilitate interactions between two or more distinct but interdependent sets of users (whether firms or individuals) who interact through the service via the Internet
WEF 2017	technology-enabled business models that create value by facilitating exchanges and interactions.
Heerschap *et al.* 2018	a digital service based on a technological, socio-cultural and economic infrastructure for the facilitation and organisation of online social (interactions) and economic (transactions) traffic between two or more distinct but interdependent groups of providers and users, with data as fuel" (Van Dijck et all, 2016, p. 11, OECD 2018, p. 13). Providers and users can be both individuals and businesses as well as science organizations and government.
Langley and Leyshon 2017, p.14	a distinct mode of socio-technical intermediary and business arrangement that is incorporated into wider processes of capitalization
Veisdal 2020, p. 539	intermediaries between two or more groups of participants with interdependent demands, …, (with a) .. main market function … typically described as the facilitation of interactions and transactions between producers of goods on one side and buyers or users on the other
Tan *et al.* 2015, p. 249	a commercial network of suppliers, producers, intermediaries, customers ….. and producers of complementary products and services termed "complementors" ….. that are held together through formal contracting and/or mutual dependency
Kenney and Zysman 2016	a set of online digital arrangements whose algorithms serve to organize and structure economic and social activity; a set of shared techniques, technologies, and interfaces that are open to a broad set of users who can build what they want on a stable substrate; a set of digital frameworks for social and marketplace interactions.
Koh and Fichman 2014, p. 977	two-sided networks ……that facilitate interactions between distinct but interdependent groups of users, such as buyers and suppliers
Pagani 2013, p.625	multisided platform …….exists wherever a company brings together two or more distinct groups of customers (sides) that need each other in some way, and where the company builds an infrastructure (platform) that creates value by reducing distribution, transaction, and search costs incurred when these groups interact with one another

A platform has two functional layers: interactions and infrastructure. Platforms play a catalytic role for value creation in the interactions of various groups of market participants leading to the exchange of information, trading, logistics and other facilities to consumers from service providers. Two-sided platforms, such as ride-hailing platforms, link two diverse types of participants more readily and enable them to gain through trade or other interaction (Evans and

Schmalensee 2007). Riders and drivers on ride-hailing platforms need each other because they cannot capture the value created on their own. Multi-sided platforms consist of more than two types of participants (Evans 2018). Social media platforms such as Facebook, for instance, bring together users, advertisers, third-party game or content developers and affiliated third-party sites.

The major strength of a platform is its ability to mediate peer-to-peer services while eliminating trade barriers using a digital mode that focuses on the facilitation of transactions in goods, services or data. The digital infrastructure in a platform increases the ease and speed of interactions of platform users, changes the scope of possible transactions from local to global, enlarges the choice possibilities of the platform users, lowers transaction costs for users to find each other and interact, and provides benefit to users as well as the platform itself (Heerschap et al. 2018). While platform companies do not own the means of production, they create the means of connection between suppliers and consumers.

Aside from increasing the number of actors involved in the platform, the platforms are also enabling individuals, which have typically been consumers, to also more easily produce goods and services themselves, and become providers. Traditionally, household production was limited to a few industries, such as agriculture, household services, and real estate. But, as a result of the rise of platforms, households have become providers of transportation services industries (as Grab drivers), food and accommodation industries (specifically in GrabFood and Airbnb, respectively) and culture and recreational industries (as individuals earning income from uploading v-logs and music, or uploading content that influence other users onto social media platforms such as YouTube and Instagram).

Platforms have created new jobs, such as crowdworkers, drivers of ride-hailing platforms and riders of food delivery platforms. While some of these jobs (e.g., drivers, cleaners) are certainly not new, but the modalities of matching workers to jobs through platforms is new, including payment schemes and value accumulation in platforms. CrowdFlowers, Microworkers and other digital labor or crowdwork platforms have facilitated the connection of employers with workers who may be spread across the world for the conduct of either microwork that require low level skills, or macrowork that involve complex tasks requiring particular skillsets (ILO 2018). These platforms may have helped people perform other kinds of jobs amidst the COVID-19 pandemic. Further, work engaged through platforms flexibly allow people to engage in gig-work. Platform-mediated online jobs, however, may also just be retrofitting traditional issues of labor exploitation in a new form, and creating more precarious situations for workers (Chen 2019; Liu 2019). A report by JPMorgan Chase & Co. suggests that in the case of drivers for ride-sharing apps, driving is not a full-time job; further, there has been a rapid rise in the number of drivers for platforms, there has also been a decline in their average monthly earnings (Farrell *et al.* 2018).

Value creation in platforms is driven by underlying technologies and infrastructure: cloud, social networks, and mobile. The cloud enables a global infrastructure, allowing platforms to create content and applications for a global set of actors. Social networks connect people and

allow people to maintain an online identity. Mobile allows interconnections anywhere, anytime.

Network effects distinguish platforms from other business models, and is one of the main drivers of value creation in the platform economy (Evans 2016). With more people using a platform, the more attractive the platform becomes to potential new users of the platform, thus triggering a self-reinforcing feedback loop of growth for value creation. The value of a platform rises with its repeated and broader use, and the platform increases with positive feedback from users, thus redefining relationships and responsibilities among platform users, and eventually dominating the value of the good or service transacted in the platform. Network effects may either be direct (where more users attract more users on the same side of the platform) or indirect (where more users on one side of the platform attract more users on the other).

The market model behind platforms are not new. Even in ancient times, bazaars have brought together various retail merchants and buyers. In modern times, classified advertisements have linked advertisers to consumers. The difference of bazaars and classified ads with platforms is that the latter are (i) leveraging technology and inter-connectivity, coupled with the power of digital data and data analytics; (ii) linking user groups; (iii) allowing these groups to interact (Koskinen *et al.* 2019).

A key characteristic of the matching of supply and demand in platforms involves multi-sided relations involving trust. As pointed out in Heerschap *et al.* (2018), the relationships among actors in a platform can be identified as B2B, B2C, C2C (also called peer-to-peer), etc. (**Table 1**). Across time, the distinction, however, between C2C and B2C transactions in platforms has become more and more fuzzy. Booking, which was initially a B2C platform, has also been offering C2C accommodation services, in addition to hotel rooms, perhaps to respond to Airbnb. Simultaneously, Airbnb which was initially a C2C platform, also includes commercial renting of apartments and holiday homes.

Table 1. Possible Relations between Actors in Platforms

		Buyer or Client			
		Consumer	Business	Government	Science
Seller or Provider	Consumer	C2C	C2B	C2G	C2S
	Business	B2C	B2B	B2G	B2S
	Government	G2C	G2B	G2G	G2S
	Science	S2C	S2B	S2G	S2S

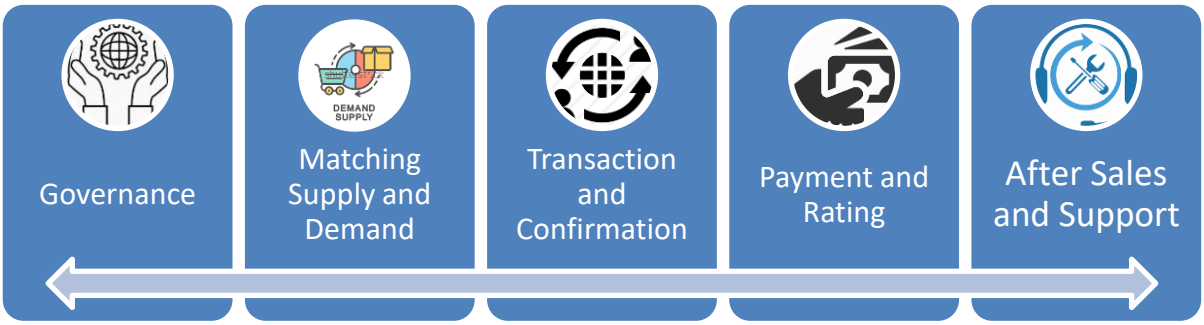
Multi-sided matching of supply and demand involves individual consumers and businesses, as well as governments and science. Each of these actors can be sellers (or providers of products or services) and buyers (or platform client). In the strict sense of the word, a buyer in a platform need not always be a consumer. Consider a business, government agency, or person maintaining a profile on Facebook, twitter or some other social media platform as a way to interact with the public. These platform actors are not necessarily buyers but merely users or clients of the platform.

At least three distinct but interdependent groups of actors, namely, sellers or provider (supply side), buyers or clients (demand side) and the platform (intermediary) itself, are always active within the platform ecosystem. The providers offer (second-hand) goods (e.g. Shopee and Lazada), skills or services (e.g. MyKuya, Grab and Netflix) and/or information (e.g., Google and Facebook) to (potential) users. These products and services can be delivered either physically or digitally. Providers receive data from the platform of their clients. On the other hand, clients search the platform for goods, services and/or information, and also receive data from the platform about providers. The platforms itself could be another actor in the ecosystem, as it facilitates the transaction between the provider and client. The platform can have other roles, such as processing payments between buyers and sellers, and even taking charge of distribution of the product to the client. Advertisers constitute a fourth set of actors. On a video-sharing platforms such as YouTube, advertisers subsidize the value of the attention and time provided by demand-side participants (video viewers) for what supply-side participants (video uploaders) provide in the platform.

The platform matches clients (or buyers) with providers (or sellers) and, if and when needed, facilitates their transaction/s. The matching process can be transparent, e.g. initiated by the user, though it is often nontransparent, i.e., making use of algorithms involving some governance rules for the matching. These algorithms are used for matching or ranking of search results, as well as for setting prices (in near real time) and for matching of users with advertisements. Together with the ecosystems of participants, this distributed network of people is the social infrastructure of platforms.

Aside from the matching, transaction, and governance, other process elements of platforms include payment systems and ratings of users, as well as after-sales and support including complaints and their resolution (**Figure 5**). The matching and transaction processes in platforms are typically based on a user-driven trust mechanism, that includes reviews and rating systems in the platforms. Often, the providers are reviewed and evaluated, but sometimes users are as well.

Figure 5. Process Elements of Platforms



Some platforms are characterized by switching costs. That is, users cannot easily transfer to other platforms. For instance, in the case of Facebook, when users invest time and energy setting up their accounts, connecting with a community of friends and followers, uploading content including posts, photos, videos, such users' investments discourage them from switching to another platform, even amidst ethical scandals about Cambridge Analytica, or

other social experiments on Facebook undertaken without their consent. When investments are tied not only to a particular platform, but to an entire ecosystem of linked platforms, users may be even less willing to switch. Positive network effects, economies of scale and scope, especially for first-mover advantages and significant switching costs, can entrench the market positions of the platform giants, and thus stifle competition.

Interaction of platform users need not always bi- or multi-directional. In the case of advertisers in a video-streaming platform, for instance, the interaction of advertiser with the platform users can occur in only one direction. Advertisers can reach platform users, but there is often no feedback from the platform user to the advertiser, and even when there is, it takes place outside the platform itself.

Sometimes the turnover in the platform is generated by investors or the inclusion of extra services, such as insurance, logistic services or cancelation fees. In order to attract more users, it is sometimes taken for granted that some platforms (e.g. Google and Facebook) provides free services. This kind of free use is an incentive to reinforce the participation of users and the value creation of the platform.

Platforms can also have either a local or global reach. They can potentially reach attract clients from across the world, especially if the platforms offer goods or services that can be provided digitally, such as data, video, books and music. Since it can scale without mass, a platform can grow quickly and efficiently to meet the demand that clients generate.

Platform-enabled companies, like other firms, generate data. The difference lies in the amount of digital data being collected on their platform users (providers and clients, alike), and the possible analytics that can be employed on these big data. Aside from the infrastructure of the platform and network effects, data is also another determinant of value creation. A platform utilizes client- and provider-generated data for the matching of providers and clients (for example by ranking the providers or search results), price settings and the targeting of the advertisements to the users. Platforms can use vast amounts of data, including user behavior data, to build detailed profiles of their providers and clients, and such processed data can be even sold as commodities. Classified ads can be customized with such data by inferring the moods, desires and even fears of platform users through their app data, and even the rhythm of keyboard typing on the platform. While this can allow platforms to have better client relationship management, but it also can be more intrusive on privacy. Thus, data collected in a platform is worth a great amount of money. Undoubtedly, there are differences in the ways in which the platforms generate and examine data on their users. Some platforms might use these digital footprints only to improve their own services (i.e. providing a better client experience, communicating with their users, optimizing their website features), but others can leverage data into business insights (by examining platform traffic and usage trends, understanding user demographics, developing detailed individual profiles on users) and, in turn, use these insights for their growth strategies to maximize value creation (by way of targeted content and advertising, attracting users and increasing platform use, or development of new services).

Several platforms have also been disruptive, drastically challenging traditional business models. Platform-enabled companies have radically reduced the market shares of traditionally dominant firms. Sharing platforms, in particular, leverage technology by matching excess capacity in private durable goods with demand, without transfer of ownership.

> "Alibaba, the world's most valuable retailer, actually has no inventory. Uber, the world's largest taxi company, does not own any vehicle, while Airbnb, the world's largest accommodation provider, owns no real estate" (Goodwin 2015)

Platform companies can scale faster and at lower cost than traditional firms (World Bank 2020). Since platforms do not incur the costs of production, they can actually scale as fast as they can add partners. The Chinese multinational company Alibaba, which specializes in e-commerce, retail, Internet, and technology, has reached 1 million platform users in two years and accumulated more than 9 million online merchants and garnered annual sales of $700 billion in 15 years. On the other hand, IKEA, the Swedish multinational group that designs and sells ready-to-assemble furniture, kitchen appliances and home accessories, took more than seven decades to generate global annual sales of US$42 billion.

Transactions in platforms can be for profit or nonprofit. If the use of the platform is not for free, providers and/or users have to pay a commission to the platform for a transaction and sometimes, even for access to the platform. Some video-streaming platforms may offer free access, but provide top-up services for access to these premiere services. Finally, if a transaction between a provider and a client results in the platform, the buyer pays the seller if the transaction is not for free. Platforms (nearly) always have some electronic ordering component, and usually the goods and services advertised on platforms can only be purchased digitally. Occasionally, the platform provides a digital wallet and payment services to facilitate digital payments for transactions. For instance, the retail platform Shopee partners with AirPay Technology, an electronic money issuer, and offers ShopeePay (in-App wallet) to clients for them to digitally pay for their transactions. The set of economic and social activities facilitated by the entire system of platforms is referred to as the platform economy.

3.2. Typology of Platforms

Platforms can.be categorized either in specific or broad terms based on several criteria (OECD 2019; Heerscap *et al.* 2018). These typologies can help facilitate focused profiles that provide insights on the business environment. Typologies of platforms can also give policy makers an understanding of the traits of platforms, their similarities and differences, that can serve as inputs to policy formulation. A natural way to classify platforms is by functionality, i.e. according to what the platforms do or how they do it. Such an approach could involve a few broad categories or a large number of narrow categories.

The Center for Global Enterprise (Evans & Gawer 2016) groups platforms into four mutually exclusive types using a functional base. These groups include:

(a) Transaction platforms which link parties (for example, drivers and passengers in Grab and Uber) more easily on the internet and through platform infrastructure, thus reducing

costs and some possible frictions in the transaction process. Nearly all platform companies (from social media platforms, to market places, and those on media, music, money, fintech, and gaming) are reported to fall into the transaction platform type. Further, most of the biggest digital platforms in the global "South" are transaction platforms, and this yields both positive and negative impacts on local institutional settings.

(b) Innovation platforms (such as the ioS and android operating systems for mobile devices). These are technological building blocks, i.e., they supply technological infrastructure as the basis for third-party developers to foster other services or products (such as apps for the iPhone and android smart phones).

(c) Integration platforms which have characteristics of both transaction and innovation platform. Further, they are more distinctive than the other platforms because these companies, such as Google, Apple, Facebook, Alibaba and Amazon, have manufacturing supply chains.

(d) The investment platform category which includes companies that are not platforms per se. Instead they invest in platform companies or act as a holding company. These companies have clear investment approaches where they provide investors "the back-end infrastructure and the front-end user experience". One example is Rocket Internet, which sets out to build a portfolio for companies in 'undeserved' markets through regional domestic investment groups.

Gawer (2015) only divides platforms into transaction and innovation types, but such a typology can be problematic as some platforms are hybrids, having both transaction and innovation features.

Platforms can also be divided broadly and functionally into:

(a) those that are set up purely to act as intermediaries, matching buyers and sellers, where typically one or other pays an intermediation fee; and,

(b) those that are set up as electronic retailers, or e-tailers, who own the products being sold.

This distinction is important since in national accounts, how transaction flows are recorded necessarily differs. In the case of e-tailers, products are sold by e-tailers through their platform, on which a distribution margin is applied and paid by the final buyer. For an accommodations or transportation platform in the sharing economy (such as Airbnb and Grab, respectively), the platform does not take ownership of any of the goods or services, it merely provides a matching service charging commission fees that may be implicitly or explicitly stated on the invoice. Often both the buyer and the seller pay these matching fees (even if the buyer is not necessarily aware, as the intermediary processes the full payment passing to the provider of the service what is left after deducting the buyer and seller commission).

Gawer & Cusumano (2013, p. 418) differentiate platforms into (1) internal platforms, which are defined as "a set of assets organised in a common structure from which a company can efficiently develop and produce a stream of derivative products", and (2) external platforms, defined as "products, services, or technologies that are similar in some ways to the former but provide the foundation upon which outside firms can develop their own complementary products, technologies or services".

Typologies of platforms may also be based on the users that platforms have, the kinds of data they collect (or what they do with the data), and the strategies for platform participation. Another broad approach that uses a structural rather than functional base, but that does not suffer from problems of hybrids, is to separate platforms into three groups according to their overall scope and structure: (i) superplatforms, (ii) platform constellations, and (iiii) stand-alone platforms (OECD 2019). The first group is a platform of platforms (such as WeChat and Facebook), with users entering through a single portal (either a website or an app); superplatforms contain many individual platforms. On the other hand, platform constellations (such as Google's main platforms), are collections of several platforms that are offered under one brand umbrella, co-existing in parallel and closely connected to one another. Unlike superplatforms, platform constellations can all be accessed separately without having to go through a single portal.

Platforms can also be classified by profit motive. In order to attract more users, it is sometimes taken for granted that no profit is made at the moment for some platforms, especially at inception. Part of the use of the platform by users can be for free. This kind of free use is an incentive to reinforce the participation and value creation of the platform. Besides non-profit models, profit models can have a range or turnover on the basis of transaction or access commissions for the provider or user or for both to turnover on the basis of advertisements or a combination. Sometimes the turnover is generated by investors or the inclusion of extra services, such as insurance, logistic services or cancelation fees. According to Van Gorp and Batura (2015), for-profit platforms often use several revenue approaches, namely:

(i) subscriptions where end users pay for the provision of a service (like Netflix or Spotify);

(ii) advertisements where end-users access free services with the platform and this access is sustained by advertising revenue (examples include YouTube or Facebook); and

(iii) an access model where content or app developers pay platforms to reach end-users (such as Iphone or Android app stores).

Platforms, however, may derive revenues from multiple sources. Thus, this typology cannot also be expected to produce clear cut mutually exclusive categories.

OECD (2019) provides another example of a broad functional typology of platforms that classifies platforms into

(a) “capital platforms” (e.g., Airbnb which relies on matching capital owners with clients who rent the accommodations) and

(b) online labor platforms (such as CrowdFlowers and Microworkers that match workers with hirers).

As in the case of the platform typology espoused by Gawer (2015), this typology has for its major limitation the existence of hybrid platforms. Transportation platforms such as Grab match drivers as well as cars with passengers, and thus fall into both capital platforms and online labor platforms.

OECD (2019) points out that broad functional typologies may not be useful on their own, but can be useful together with other approaches. The typology of Evans & Gawer (2016) which categorizes platforms into transaction, innovation, (integration,) and investment, could, for instance, be seen as using criteria on product and services. Two other examples are the two sets of typologies Codagnone et al. (2016) propose two sets of typologies, each involving two criteria. The first set uses profit orientation and interaction modality, while the second set is based on interaction modality and asset mix. Profit orientation varies from not-for-profit to for-profit; interaction modality varies from organisation-centered/led to peer-to-peer centered/led; and asset mix varies from capital to labour. They provide examples that illustrate that platforms are in a continuum underlying the categories, rather than falling neatly into mutually exclusive types, and that some platforms are hybrids under both typologies.

The typology in OECD (2016) is another example of an approach that uses several criteria for categorizing platforms, here from the perspective of labor and employment policy formulation. The typology uses six criteria at the same time for categorizing platforms. These criteria include: (i) functionality, (ii) the medium of work delivery (physical versus digital), (iii) whether or not the work is routine, (iv) whether or not the work is manual or cognitive, (v) whether the work is labor or capital intensive, and (vi) a broader version of functionality.

A narrower functional typology could be also used to eliminate certain sub-categories of platforms within broader groups in order to come up with a typology suitable for policy or business use. For instance, Platform Hunt (2016) suggested nine types of platforms: innovation platforms were broken down into (i) technology platforms and (ii) computing platforms; search engines were called (iii) Utility Platforms; social media platforms were categorized into (iv) Interaction Networks and (v) Content Crowdsourcing Platforms; transaction platforms into (vi) Marketplaces and (vii) On-demand Service Platforms; and other platforms were grouped into (viii) Data Harvesting Platforms and (ix) Content Distribution Platforms. Another example of narrow functional type of typologies is that given by OECD (2019), which groups platforms into : (i) ad-supported messaging platforms (WeChat, Facebook Messenger); (ii) app stores (Amazon Appstore for Android, Apple App Store, Google Play); (iii) C2Cs (MercadoLibre Marketplace, Taobao); (iv) labour freelancing/crowdsourcing (Freelancer, Mechanical Turk); (v) long-distance carpooling (BlaBlaCar); (vi) mobile payments (WeChat Pay, Alipay); (vii) search advertising (Baidu, Google); (viii) short-term accommodation (Airbnb); (ix) social media (e.g. Facebook, WeChat, YouTube); (x) superplatforms (WeChat, QQ) ; (xi) third-party

businesses-to-businesses (B2Bs) (e.g. Alibaba, Amazon Business); (xii) third-party businesses-to-consumers (B2Cs) (Amazon Marketplace, MercadoLibre Classifieds, Rakuten, Tmall).

Whether broad or narrow functional typologies are used, it will be difficult to have categories that are mutually exclusive, as some platforms, especially superplatforms, are likely to have features from several categories. Furthermore, functional typologies get archaic as platforms evolve in time, necessitating periodic adjustments for the typologies to stay relevant.

3.3. Indicators and Measurements

In practice, the definition, features, and typologies of platforms described in the previous sections come with a number of statistical challenges. Measurement of the platform economy in each country can be extremely challenging, beyond the absence of a common definition of what we mean by a platform. In the first place, platforms (and providers) may also not be physically located in a country concerned, thus their economic transactions are not actually directly part of national economic statistics. Given the possible cross-border scope of transactions in platforms, developing a complete list of platforms in a country can be challenging. Even if this could be done, gathering data from foreign-based platform companies may not be feasible, unless they are forced by laws in a country to set up branches there.

Furthermore, there is no specific economic activity code for platforms. If platform companies are part of the business register or the census of business and industry in a country, they will often not be included in the industry in which they are active, but rather in other industries. There is a growing tendency for horizontal and vertical integration of activities of platforms, which can be cross-sectoral, i.e., platforms could be active not only in one sector alone, but also in several sectors. For example, Amazon, which used to sell only (second-hand) music and books, has already been selling all kinds of products. The social media platform WeChat adds other services and functions to support their social media activities, including even transportation services, marketplace activities, payment options, among others. These types of combined economic activities of platforms usually do not fit well with the current classifications of statistics.

Platform companies are likely to be included in ICT or trade, but platforms are cross-sectoral and thus, they do not straightforwardly fit into official classification systems such as industrial classification codes. For instance, while the Philippine Standard Industrial Classification (PSIC) includes a sub-class class code [47913] for “retail sale via internet” within Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles [Section G] but there is no comparable sub-class code for platforms beneath specific services sectors (PSA nd). The PSIC is consistent with the International Standard Industrial Classification of All Economic Activities Revision 4 (UN 2009), which recognizes e-commerce, i.e. “ownership of the goods or service through the Internet or by other electronic means’, but not economic activities related to sharing of goods or services in ride-sharing or accommodations-sharing platforms.

Another measurement challenge is that transactions are not always financial. In social media platforms, for instance, transactions are about data and information, and thus, the valuation of

such transactions can be quite challenging. Economic variables such as revenue and employment can also often difficult to trace since platforms spread supply across small-scale non-professional providers. Earnings and employment of these platforms may be under-estimated in traditional business surveys, as well as labor force surveys, conducted by NSOs. Many digital platforms also do not publish their accounts or disaggregate these data across country boundaries.

The increase of international trade through platforms is difficult to visualize through traditional economic statistics, especially the national accounts. As was pointed out earlier, many platforms and providers are not physically located in the country concerned, therefore their economic transactions are not directly part of national statistics.

Despite all the challenges in measuring the platform economy, some NSOs, e.g. Statistics Canada (2017), United Kingdom' ONS (2017), Eurostat (2018), have begun measurements given the growing importance of the platform economy. Much of these undertakings has focused on the sharing economy, which narrows platforms down to mostly C2C relations and transactions. As pointed out earlier, in sharing platforms, transactions do not have transfer of ownership. Natural persons who possess underused or idle assets, such as property (homes, cars), resources (tools, money) time or skills, lend to other persons through sharing platforms on accommodation (e.g. Airbnb), transportation (e.g. Uber and Grab), administrative support (Clickworker), small jobs and crowd funding (Kickstarter) and design or consultancy work (Upwork). Note that innovation-driven online platforms, incl. social media (and e-commerce platforms), fall inside the scope of platform economy, but outside the coverage of the sharing economy. Eurostat (2018) only considers sharing and lending of assets, such as homes, cars etc., as part of the sharing economy. In other words, the gig economy, which provides supply of labor for small jobs, as well as crowd funding platforms are not part of sharing economy in the Eurostat approach, but are separate categories of the C2C economy.

Using the conceptual framework of UNCTAD (UN 2019) for measuring the entire digital economy that makes use of the prisms of national accounts prisms on products, production, aside from the nature of the transactions, we can identify cases that need to be addressed for platform economy measurement within the scope of classification, output and prices measurement of services. As was pointed out by Barrera *et al.* (2018), for the most part, the goods and services in platforms are not new but rather only transacted and delivered in new ways, and thus most of the relevant transactions in the digital economy, and the platform economy, in particular, are within the SNA production boundary (**Table 2**). That is, measuring the broader digital economy and the platform economy, in particular, through the national accounts is straightforward. Making use of a satellite account within the national accounts ensures that estimates of resulting indicators of the platform economy, when made across countries, are comparable given the consistency in definitions, concepts and classifications. This also recognizes conceptually the role of the enablers for the functioning of the platform economy, from technology, to network effects, to digital data.

Beyond a conceptual framework, a statistical framework requires institutional arrangements (legislative, budgetary, organizational, collaborative and coordinative, managerial and

customer relationship arrangements) to further support the environment for integration of data compiled from various sources (including surveys, business registries, and other data sources). Further, the conceptual framework should be operationalized through the statistical production process as an integrated production chain from the collection of basic data to the dissemination and communication of resulting statistics. After identifying required data, data sources and indicators, The estimation process would involve firstly develop a conceptual definition of the platform economy, and identifying the goods and services within the supply-use framework relevant for measuring the platform economy, using the supply-use framework to identify the industries responsible for producing these goods and services, and then estimating the output, value added, employment, compensation and other variables associated with socio-economic activities of platforms.

The challenge in measurement is largely that the nature of digital goods and services are changing rapidly. New products such as digital intermediation services should be added to classification systems and properly recorded. An added complexity is the strong possibility that these transactions often include a cross-border component, and thus, such transactions should be unbundled into their separate flows.

Table 2. Platform Economy Cases by Type of Industry, Product and Transaction

Case		Examples	SNA Production boundary		Type of industry			Transaction			Product		
			within	outside	non-digital	digital enabling	digital platform	digitally delivered	digitally ordered	platform enabled	non-digital services	digital services	information/ data
1	**Non-digital services intermediated by platforms (C2C)**												
1.1	Sharing economy services (C2C transactions) intermediated via platforms	Accommodation on Airbnb, taxi service on Grab,	**X**		**X**				**X**	**X**	**X**		
1.2	Digital intermediation services for the sharing economy	Food delivery and logistics services on GrabFood and Lalamove	**X**				**X**	**X**	**X**			**X**	
2	**Non-digital services intermediated by digital platforms (B2All*)**												
2.1.1	Non-digital service ordered online	Air transport/accommodation, ordered via	**X**		**X**				**X**		**X**		

Table 2. Platform Economy Cases by Type of Industry, Product and Transaction

Case		Examples	SNA Production boundary		Type of industry			Transaction			Product		
			within	outside	non-digital	digital enabling	digital platform	digitally delivered	digitally ordered	platform enabled	non-digital services	digital services	information/ data
		airline/hotel own website											
2.1.2		Air transport/accommodation, ordered via intermediary platform	**X**		**X**				**X**	**X**	**X**		
2.2	Digital intermediation for corporate non- digital services	Booking, Hotels.com	**X**				**X**	**X**	**X**			**X**	
3	**Online product sales**												
3.1	Online retailers	Shopee, Lazada, Amazon	**X**				**X**	**(X)**	**X**			**X**	
3.2	Online sales by storefront retailers	Department stores selling a portion of their sales via own website.	**X**		**X**				**X**		**X**		
4	**ICT Service Sector****												
4.1	ICT Services: Data processing, hosting, and related	Data platforms: Google, Facebook.	**X**			**X**		**X**			**X**		

Table 2. Platform Economy Cases by Type of Industry, Product and Transaction

Case		Examples	SNA Production boundary		Type of industry			Transaction			Product		
			within	outside	non-digital	digital enabling	digital platform	digitally delivered	digitally ordered	platform enabled	non-digital services	digital services	information/ data
	activities; web portals												
5	Digitally delivered content and media												
5.1	Paid	For a fee: Netflix, Spotify, eBooks	**X**				**X**	**X**	**X**			**X**	
5.2	Free	For free-collaborative: Wikipedia, Reddit		**X**		**X**		**X**	**X**			**X**	**X**

Notes:
* = B2All means B2B, B2C, B2G, B2S
**= Other cases in ICT Service Sector are part of wider digital economy but not part of platform economy
Note: Adapted from Voorburg (2018)

NSOs should be more frequently revising their classification systems, and updating other statistical infrastructure to be able to adequately capture these fast-paced changes, otherwise the key official economic statistics such as GDP, the Consumer Price Index, the unemployment rate, international imports and exports, household expenditure and income, may not be suitably describing the economy, especially arising from technological improvements.

Further, despite the seeming suitability of using current conceptual frameworks on national accounts to estimate the platform economy, there is valid criticism that GDP does not properly capture the benefits received from free goods such as data and knowledge resulting with increasing digitalization, particularly the use of platforms. Activities related to free data and knowledge are not in the production boundary of national accounts. Further, current increased production from households are not operationally accounted for, as households have been always considered only from the expenditure side. Yet there is growing evidence that households production and income have been increasing recently on account of the platform economy.

The economic activities of platforms are already partly captured in the national accounts (see **Table 3**). However, a distinction has to be made between market and non-market transactions. Only market transactions, which involve payment in money or in kind, are valued in national accounts. Even though the trading of second-hand goods involves a replacement value for the economy, this is not part of national accounts valuation.

Working within the national accounts conceptual and statistical frameworks for measuring the platform economy can pose a limitation as traditional economic statistics from the national accounts do not always allow for gender, age and other relevant disaggregated data to examine how various groups in society are affected by platforms and the emerging digitalization, in general. Data constraints also can limit the operationalization of a conceptual framework for any satellite accounts. Furthermore, the ITU also warns that "current measurement efforts do not always reflect the socio-economic impact of the digital transformation or the upstream[6] and downstream[7] consequences on the economy as a whole as opposed to just the digital share."

According to the Dutch Transformation Forum (2018), the total market size of companies in the global platform economy stands at $7.2 trillion in 2018, up from an estimated $ 4.3 trillion in 2016 (Evans and Gawer 2016). The 2018 estimate of the platform economy market size was based on a survey of 242 platform companies, while the 2016 estimate is based on 176 platform companies. The digital platform companies in 2018 are dominated by the US and the PRC: 72% of total market value are platforms based in the US, while 25% are from the PRC, as of 2018.

[6] Upstream issues arise when the dynamics of the digital economy impacts the internet market, for example when a data driven business model affects the boundary of commercial feasibility of internet access in a developing country.

[7] Downstream issues arise when digital disruption impacts the product/service market: the emergence of digital platforms affects hospitality, local transport, real estate business, and other activities.

Table 3. Providers and Clients of Platforms

Case		Examples	Providers or Sellers/ Producers (institutional sector)					Clients or Buyers / Users (institutional sector)				
			Corporations	Household	Government	NPISH*	RoW**	Corporations	Household	Government	NPISH*	RoW**
1	**Non-digital services intermediated by platforms (C2C)**											
1.1	Sharing economy services (C2C transactions) intermediated via platforms	Accommodation on Airbnb, taxi service on Grab,		**X**					**X**			
1.2	Digital intermediation services for the sharing economy	Food delivery and logistics services on GrabFood and Lalamove	**X**				**X**		**X**			
2	**Non-digital services intermediated by digital platforms (B2All***)**											
2.1.1	Non-digital service ordered online	Air transport/ accommodation, ordered via airline/hotel own website	**X**						**X**	**X**	**X**	**X**
2.1.2		Air transport/ accommodation, ordered via	**X**						**X**	**X**	**X**	**X**

Table 3. Providers and Clients of Platforms

Case		Examples	Providers or Sellers/ Producers (institutional sector)					Clients or Buyers / Users (institutional sector)				
			Corporations	Household	Government	NPISH*	RoW**	Corporations	Household	Government	NPISH*	RoW**
		intermediary platform										
2.2	Digital intermediation for corporate non- digital services	Booking, Hotels.com	**X**				**X**	**X**	**X**	**X**	**X**	**X**
3	**Online product sales**											
3.1	Online retailers	Shopee, Lazada, Amazon	**X**				**X**	**X**	**X**	**X**	**X**	**X**
3.2	Online sales by storefront retailers	Department stores selling a portion of their sales via own website.	**X**					**X**	**X**			
4	**ICT Service Sector******											
4.1	ICT Services: Data processing, hosting, and related activities; web portals	Data platforms: Google, Facebook.	**X**				**X**	**X**	**X**	**X**	**X**	**X**
5	Digitally delivered content and media											
5.1	Paid	For a fee: Netflix, Spotify, eBooks	**X**				**X**		**X**			**X**

Table 3. Providers and Clients of Platforms

Case		Examples	Providers or Sellers/ Producers (institutional sector)					Clients or Buyers / Users (institutional sector)				
			Corporations	Household	Government	NPISH*	RoW**	Corporations	Household	Government	NPISH*	RoW**
5.2	Free	For free-collaborative: Wikipedia, Reddit	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

Notes:
* = non-profit institutions serving households
** = rest of the world
*** = B2All means B2B, B2C, B2G, B2S
**** = Other cases in ICT Service Sector are part of wider digital economy but not part of platform economy
Note: Adapted from Voorburg (2018)

About half (46%) of the platform companies with a value of +$1 billion are based in the US, while a third (35%) are based in Asia (mostly in the PRC). The presence of platforms is strong in four sectors, viz., Internet Software & Services, Ecommerce & Retail, Social and Search, though in recent years, platform companies have also shifted focus to a variety of other sectors. Platform companies are also highly concentrated around seven super platforms (that have a combined market value of over $ 250 billion): US-based Apple, Amazon, Microsoft, Google, Facebook and the PRC-based Alibaba and Tencent, which together have an aggregate market value of $4.9 trillion (or 69% of the total market value of the 242 platform companies).

To get an accurate, robust and meaningful profile of platforms in a country, data have to be collected from the various actors of the platform ecosystem: providers, the users and the platforms themselves **(Box 2**). That means that three different groups of actors in platforms should be respondents for surveys to measure the platform economy.

Box 2. Data and Indicators Needed for Measuring Platform Economy

Dimension	Data	Indicators
General Information on Platforms	▪ Business Name, Registered Name, and address of owner of platform (including Headquarters/Main Office and Parent Company, if any) ▪ Url(s) of the platform(s) ▪ Birth date / Year that the platform(s) started operations ▪ Geographic reach of the platform's operations (i.e., local, national, global); ▪ Type of platform: (based on either general or specific functional base, or other typology) ▪ Whether platform is part of C2C economy (yes/no) ▪ Whether platform is part of sharing economy (broad and narrow definition) (yes/no) ▪ Product/s and service/s exchanged between providers and users: asset and service mix (economic activity group) ▪ Breakdown of providers by type (professional or non-professional) ▪ Advertisement parties involved	▪ Number of Platforms by Region ▪ Proportion of Platforms by Age ▪ Number of Platforms by Geographic Reach ▪ Proportion of Platforms by Type of platform ▪ Number of Platforms in the C2C Economy; in the Sharing economy ▪ Number (and Size) of Platforms by Economic Activity Group ▪ Number of (and Size) of Platforms by Type of Provider ▪ Number (and Size) of Platforms by Advertisement Parties Involved
Economic Information on Platforms	▪ Business model: profit-orientation (profit, non-profit, commission-based, advertisement-based or a combination); Other sources of income from other services or add-ons. Or more general: how does the platform make money ▪ Employment: number of directly persons employed by platform (employers + employees, e.g. those maintaining tech infrastructure, administration and marketing); Characteristics of employed:	▪ Number (and Size) of Platforms by Business Model ▪ Number of Employed (by Sex) by Type of Platform (or Economic Group) ▪ Number of Employed by Educational Attainment and by Type of Platform (or Economic Group)

Dimension	Data	Indicators
	breakdown by sex, breakdown by educational attainment; hours worked ▪ Type of investors and investments made in the platform ▪ Tax payment (and type, i.e. income tax, VAT, etc.) ▪ Type of network effects: what drives the growth of the online platform (e.g. more participants, more transactions, more content etc.) ▪ Who sets the prices and circumstances of logistics (e.g., delivery of good or service) ▪ Turnover, including source/s of the turnover ▪ Value added, i.e. turnover minus costs for intermediate goods and services ▪ Investments made in the platform, including the type of partners ▪ Type of providers: non-commercial and commercial	▪ Hours Worked by Type of Platform (or Economic Group) ▪ Number of platforms by type of investors (or investments made) ▪ Percentage of platforms that paid taxes ▪ Number of platforms by type of network effects ▪ Number of platforms by mechanism for setting prices and logistics ▪ Average turnover, by source and by type of platform ▪ Average value added, by type of platform (or economic activity group) ▪ Average investments in platform, by type of platform (or economic activity group) ▪ Number of platforms by type of providers
Social Information on Platforms	▪ Verifying providers and their offers and checking for illegal content ▪ Verifying clients ▪ Advertisement parties involved ▪ Collection of data of providers and clients and the uses of these data (e.g. algorithms and selling of data)	▪ Number of platforms by type of verification process for providers ▪ Percentage of platforms with verification process for clients by type of platform (or economic activity group) ▪ Percentage of platforms with advertisement parties involved by type of platform (or economic activity group) ▪ Number of platforms by type of platform and by type of data collection activities on platform users ▪ Number of platforms by type of platform and by data collection use
Basic Information on Platform Providers	▪ Name of Individual/ household respondent or Business ▪ Background characteristics: Location; Year that the provider(s) started offering good or service in platform/s; Individual/household or Business; Reasons to use a platform;	▪ Total number of unique providers by type (individual/household vs business) ▪ Total number of unique individual providers (active or passive) by

Dimension	Data	Indicators
	Type of goods or services offered (relative to some classification system); Part of sharing economy (i.e., offering use of idle asset, or not) ▪ Number of transactions per year (including turnover).	location (urban/rural, or region) ▪ Growth rates in number of unique providers (active or passive) ▪ Total number of providers by reasons to use a platform ▪ Total number of providers by type of goods or services offered ▪ Percentage of providers in sharing economy, by location
Economic Information on Platform Providers	▪ Number of transactions per year in past two years ▪ Average prices per transaction ▪ Average transaction costs made to use the platform (commission and/or access) ▪ Investments and value added ▪ Tax payment ▪ International trade/cross-border transactions (percentage compared to all transactions) ▪ Main source or supplementary source of income	▪ Total number of transactions per year by location ▪ Growth/decline of transactions per year, including total turnover. Estimate of total turnover: average price x number of transactions per year (minus transaction costs); ▪ Total investments and value added ▪ Percentage of providers paying tax ▪ Share of international trade/cross-border transactions (in percent) to total transactions ▪ Percentage of providers whose income from platforms is main source (or supplementary source) of income
Social Information on Platform Providers	▪ If provider has working relationship to the platform (relates mostly to indirect employment): hours worked and earnings (does this constitute the main income). Account should be taken of the fact that people can work for or be associated to more than one online platform ▪ Total income, ▪ Social security ▪ Legal contract ▪ Training possibilities	▪ Percentage of providers with working relationship to the platform ▪ Average hours worked by sex and by location ▪ Average earnings by sex and by location (for those with platform incomes constituting the main source of income, and for others) ▪ Average income by sex and by location ▪ Percentage of providers with social security

Dimension	Data	Indicators
		▪ Percentage of providers with legal contract ▪ Percentage of providers with training possibilities
Basic Information on Platform Clients	▪ Name of Platform Client ▪ Background characteristics: Location; Year that the client(s) started purchasing good or service in platform/s; individual-household or business; number of visits to a platform per year; type of goods or services bought or shared, including prices; Reasons to use platform(s); ▪ Number of visits to an online platform per year (or month or week); ▪ Number of transactions per year (money spent, including the commission to the platform); ▪ Type of goods or services bought or shared; ▪ Reasons to use online platform(s); ▪ Trust in platforms (e.g. role of reviews and rating systems); ▪ International trade/cross-border transactions (percentage compared to all transactions);	▪ Total number of unique clients by type (individual/household vs businesses) ▪ Total number of unique clients by sex and by location (and growth or decline) ▪ Average number of visits to a platform per year (or month or week) ▪ Total number of clients by type of goods or services bought or shared ▪ Average prices for major good or service bought or shared ▪ Total number of clients by reason for using platform(s) ▪ Average share of cross-border transactions to total transcations
Economic Information on Platform Clients	▪ Average number of transactions per year (or month or week) ▪ Average expenditures on platforms, including the commission to the platform) ▪ International trade/cross-border transactions (to total transactions) in platform	▪ Number of transactions per year ▪ Growth / decline of transactions per year ▪ Average expenditures on platforms by type of platforms (including the commission to the platform) ▪ Share of cross-border transactions to total transactions in platform
Social Information on Platform Clients	▪ Trust in platforms (e.g. role of reviews and rating systems) ▪ Number of complaints in platform (and of which, how much got sufficiently resolved)	▪ Average Trust rating of platforms by type of platform ▪ Average Number of complaints in platform(s) by type of platform

Note: Adapted from Heerschap (*et al.* 2018)

Key data and statistical indicators are needed to measure the platform economy. On the one hand, there is the need to separate platforms from the traditional economy. This means that we would need specific indicators for platforms and their operations, the providers (supply), the users (demand) and the advertisers, as well as the transactions. On the other hand, for

comparison reasons, there is also need to link indicators of platforms with existing statistical indicators and domains.

A pre-condition for any new set of measurement processes is ensuring that the cost of collecting new data and the respondent burden has to be kept as low as possible. Descriptive indicators suggested below are restricted to basic characteristics of the platforms themselves, the providers of the platforms, and the users of the platforms.

3.4. Data Sources

The data for the indicators mentioned above can be collected in different ways. An important first step is to have a target population or list frame of platforms. Such a frame is likely not available in many countries except perhaps for those that are attempting to measure the platform economy, specifically the sharing economy. NSOs could initially start with the most "important" platforms, in terms of public visibility, and thus limit the coverage of examination.

Some data collection methods are better for particular actors of the platform ecosystem. When it concerns cross-border digital trade, international cooperation is necessary. Possible options of data collection are:

(1) Setting up a new dedicated survey for measuring the platform economy. Survey questionnaires can be sent to providers and users, but especially to the platforms. Households are no longer just consumers, but also producers; the nature and extent of their productive activities needs a new survey, that should also capture information on imports of goods and services directly undertaken by households. That households are now direct importers and exporters needs to be properly recorded in national accounts. NSOs need to work with platforms to obtain aggregate information on productive activities of households, and cross-border flows. It is likely, however, that most platforms will not be very willing to share information. A way around the issue of the supply of platform data is to make data sharing mandatory to NSOs by law, even when the headquarters of a platform company is outside the country (Scassa 2017).

(2) Alternatively, NSOs could make use of existing surveys, and add a module of questions for measuring the platform economy. Candidate surveys are the Labor Force Survey, household surveys of ICT usage, business surveys of ICT usage. These surveys can target the providers and users of platforms (and not the platforms themselves).

(3) The available digital footprints on platforms could be web-scraped. If there is already a list of platforms (with URLs) available in a country, NSOs can use web scraping and application programming interfaces to collect some desired information from the websites of platforms (such as site visits of users, and possibly financial accounts) though this is not always a straightforward exercise. If the list of platforms in not available, an initial list could be created on the basis of a web search of the whole internet (focusing on a country domain) with a bot. The bot, with the aid of machine learning, should be able to distinguish "normal" websites from websites with platforms on the basis of available data from the web search.

The various typologies of platforms discussed in the previous section show the challenge in coming up with a single survey for all classifications of platforms, which can vary considerably in features from each other. For a sharing platform, the distinction between a natural person (peer) offering a service and a (micro) enterprise offering the same service can be blurry. Even in a gig- or online labor platform, the difference between a natural person seeking a gig through a temporary employment agency or through a platform may not be straightforward. If all possible typologies of platforms and platform users are taken into account in a survey of platforms, providers and clients, the survey questionnaires are likely to be long and complicated.

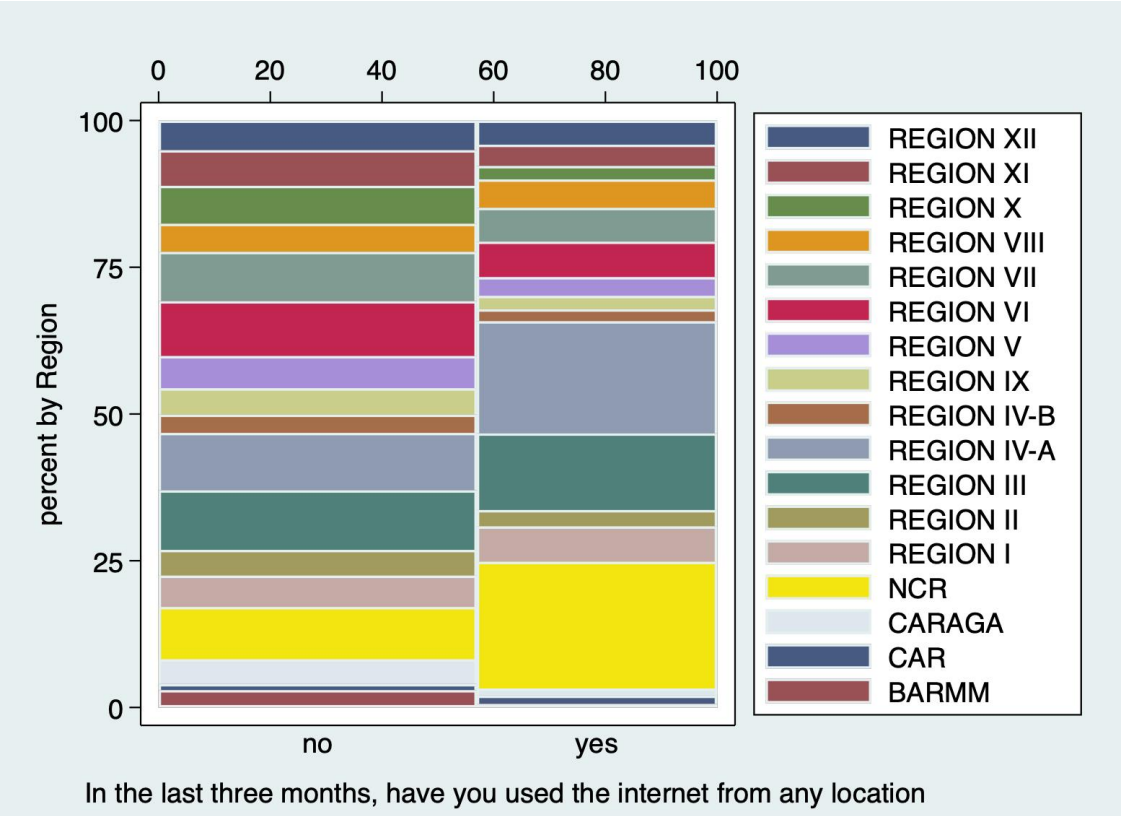
International organizations such as the UNCTAD, IMF and OECD have set up work programs and international working groups to advance the statistical and conceptual frameworks that will help NSOs measure the digital economy (and the platform economy) in a consistent manner. This work involves everything from definitions for the digital economy and other new economy models, to experimenting and testing ways to capture the welfare benefits associated with the digital economy in the System of National Accounts (European Commission *et al.* 2009). These international organizations have also organized knowledge activities where they have brought together experts and representatives of NSOs to look at various measurement issues. Dedicated surveys, should possibly be coordinated at regional levels by international organizational organizations for developing economies, that could target platforms especially, as well as platform users.

Some NSOs in advanced economies have been undertaking methodological work. The U.S. Bureau of Economic Analysis experimenting with approaches to look into transactions outside the production boundaries of national accounts in order to obtain a value of the consumption of "freely" available information, while the U.K.'s Office of National Statistics has been re-examining its approach to accounts for quality change in the prices of digital products and services such as household broadband services (Loranger *et al.* 2018).

Developing countries should be conducting more regularly household and business surveys on ICT use, harnessing the use of administrative records, and exploring data from innovative sources (such as web scraping) and integrating these with available data from traditional data to address data gaps.

In the Philippines the DICT, in cooperation with the PSRTI, conducted in 2019 the first ever National ICT Household Survey aimed at gathering baseline data on household access and use of ICT services and equipment. The survey provides measures of key indicators of household ICT use in support of national ICT development planning and policy-making. The results suggested that among Filipinos aged 10 years old and over, 43 percent use the internet, of which, more than half (53%) are in Metro Manila, i.e., the National Capital Region (NCR), and its neighboring regions CALABARZON and Central Luzon (**Figure 6**). Since internet use of households is much less outside of the Metro (and neighboring regions), there is a lot of room for lessening the digital divide that can ensure that digital dividends on platform use are made more inclusive.

Figure 6. Percentage Distribution of Filipinos aged 10 and above using the Internet by Region

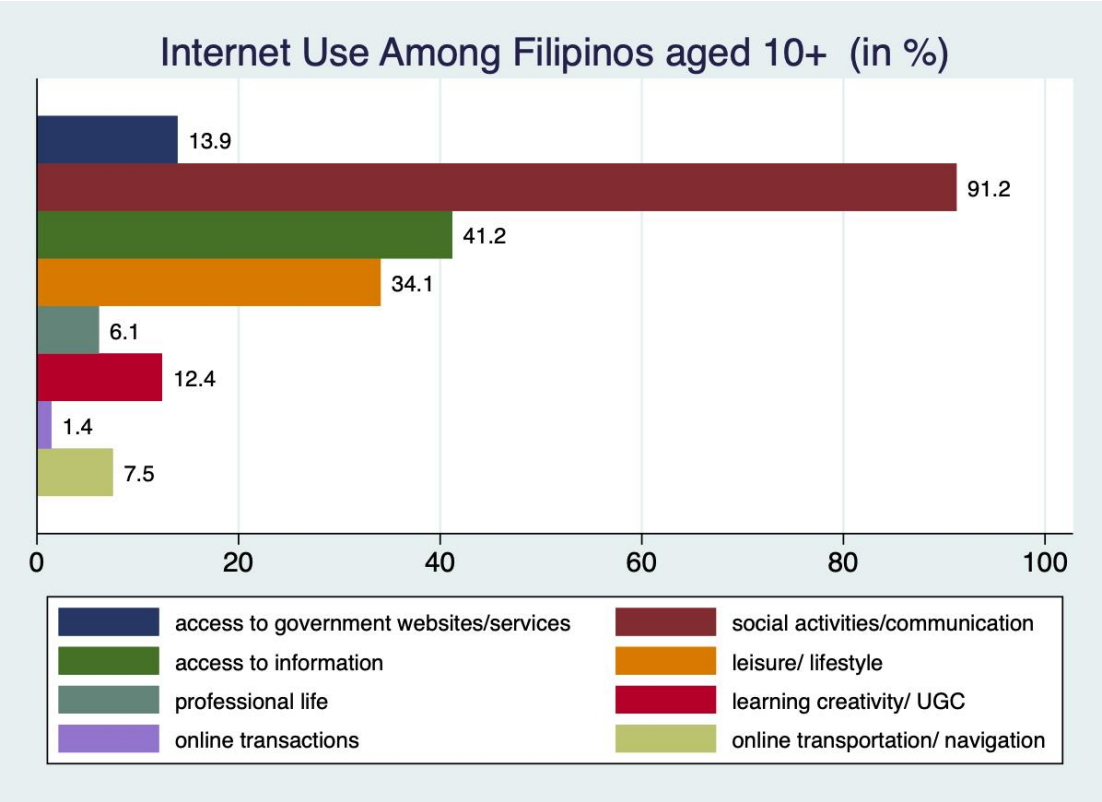


Source: National ICT Household Survey, DICT

Figure 7 shows that among Filipinos aged 10 years and above who go online, the bulk of internet activity for private or personal purposes is on social activities/ communication (91%); followed by access to information (41%) and leisure/lifestyle (34%). Around a tenth or less go online for creativity (12%), online transportation/navigation (8%), and professional life (6%) and online transactions (1%). These results validate information from We Are Social and Hootsuite (2020) that Filipinos connected to the net are world leaders in use of social media, and that the extent of e-commerce activities and online banking transactions are limited and thus should be an area of growth. There is evidence[8] that amidst the global pandemic, Filipinos have made much more use of platforms to cope with restrictions in movements imposed by the government, and it is likely that such changes in consumption behavior will be sustained in a post-COVID-19 world.

[8] https://news.abs-cbn.com/advertorial/life/06/03/20/ecommerce-platform-lazada-shows-filipinos-spent-greater-time-online-in-recent-months

Figure 7. Internet Use for Private or Personal Purposes Among Filipinos aged 10 years and over by Activity



Source: National ICT Household Survey, DICT

A total of 15.5 Billion PhP monthly was spent on online purchases, led by Calabarzon, Metro Manila and Central Luzon that have a combined 70% share of total expenditures in the Philippines. A third of total online spending was on clothing, while about a fifth of total expenditures on online purchases was on household goods; meanwhile a tenth of total online spending each was on electronics, and on cosmetics (**Table 4**).

Table 4. Total Monthly Expenditure (in '000 PhP) from Online Purchases, by Type of Good/Service

Good / Service	Total expenditure	Share (in %) to Total
Creative Content	105	0.1
Professional Services	177	0.1
Financial Products	303	0.2
Music Downloads And Music Streaming Subscriptions	752	0.5
Video Downloads and Video Streaming Subscriptions	884	0.6
Medicine	1,105	0.7
Books, Magazines, Or Newspapers	1,288	0.8
Computer or Video Games	1,855	1.2
Tickets or Bookings for Entertainment Events	1,863	1.2
Computer Software	2,042	1.3
Food, Groceries, Alcohol or Tobacco	3,558	2.3
Travel Products	4,494	2.9
Computer equipment or parts	7,429	4.8

Good / Service	Total expenditure	Share (in %) to Total
Cosmetics and Fragrances	14,910	9.6
Consumer Electronics and Accessories	16,100	10.4
Others	16,650	10.8
Household Goods	28,100	18.2
Clothing, Footwear, Sporting Goods or Accessories	53,080	34.3
TOTAL	154,695	100.0

Source: National ICT Household Survey, DICT

Table 5 shows that total monthly income across the country averaged 12.3 billion PhP, with clothing garnering a fifth of online income, while a tenth each went to cosmetics (and fragrances), and another tenth came from income from food (including groceries, alcohol and tobacco).

Table 5. Total Monthly Income (in '000 PhP) from Online Selling, by Type of Good/Service

Good/Service	Total monthly income	Share (in %) to Total
Books, Magazines, Or Newspapers	38	0.0
Tickets or Bookings for Entertainment Events	481	0.4
Computer Software	1,123	0.9
Travel Products	1,333	1.1
Medicine	1,869	1.5
Creative Content	2,293	1.9
Computer equipment or parts	2,999	2.4
Household Goods	5,273	4.3
Financial Products	5,929	4.8
Computer or Video Games	7,413	6.0
Professional Services	8,031	6.5
Consumer Electronics and Accessories	8,231	6.7
Food, Groceries, Alcohol or Tobacco	14,690	11.9
Cosmetics and Fragrances	15,090	12.2
Clothing, Footwear, Sporting Goods or Accessories	24,190	19.6
Others	24,330	19.7
TOTAL	123,313	100.0

Source: National ICT Household Survey, DICT

Average monthly income of Filipinos was estimated at around 90US$ (8700 PhP) from online selling in the Philippines. Across regions, Davao and Eastern Visayas led in mean income from online selling, thus suggesting that while spending is skewed toward the Metro, the income from online transactions tend to go outside of the Metro. The challenge here is for the PSA to integrate such information on household income (and production) into the production side of national accounts, as currently accounting of household activities are treated more on the expenditure side. Further, the increasing production from households also has important measurement implications not only for economic performance but also for the labor market. In this paper, we have hardly touched on issues about measuring the contribution of platforms to the labor market.

4. Summary, Key Policy Issues and Ways Forward

In summary, the emerging platform economy is a catalyst for wealth creation, social good and innovation, providing ground-breaking benefits for producers and consumers alike, but, the platform economy also brings many risks on fair competition, trustworthiness, consumer rights, including data privacy, and decent working conditions. This requires at least new regulatory frameworks that can allow the connection, participation and inclusion of those previously unmatched in traditional markets, and thus make socio-economic growth inclusive, while exercising some restraint so as not to stifle digital innovations. To get a good picture of the platform economy, new data and indicators are needed. Given the complex business processes of platforms, it is, however, a statistical challenge to actually obtain information from platforms, and even to make use of traditional data sources (business registries, and sample surveys of businesses and households). Households are no longer just consumers, but increasing becoming producers, but obtaining information on productive activities of households may be challenging, so NSOs need to work with platforms to obtain this information.

Work has begun on measuring the larger digital economy, and even on platform economy measurement, with a focus on the sharing economy. Measuring the platform economy and its impact can be challenging because of the complexity, cross-sector and cross-border capacity, and rapid growth of platforms amidst vastly changing goods and services. Usage data in platforms can proxy for economic value, thus web-scraping of platforms by NSOs can be a valuable tool for obtaining information on socio economic activities in platforms, aside from conducting new surveys of users of platforms (both suppliers and clients), as well as the platforms themselves. Private sector organizations are also currently collecting various data, and generating information on the platform economy, but discussions on their methods and the extent of coverage on their work is unknown. NSOs can start working with these organizations, and re-engineer their existing surveys, e.g. labor force surveys, business surveys, household and business surveys on ICT usage, and supplement traditional data collections with alternative data sources. NSOs need to develop mechanisms for integrating new data and new data sources into national accounts compilations. For instance, households have been typically viewed only from the expenditure side, but household production is increasing especially in the platform economy, and this has not been incorporated into national accounts estimation. International cooperation may also be necessary for reaching out to platforms, which may not be physically present in countries. Further, statistical standards will also need to be developed.

Measurements on the platform economy have wide policy implications for ensuring positive dynamic of social good of platform economy continues while preventing possibilities for widening inequalities and power imbalances in society. Digital footprints left in platforms can expose platform users to misuse of personal data. Lack of trust even by those connected to the internet on how personal data is kept and managed by platforms can makes platform users reluctant in engaging in electronic money transactions, and thus limit growth in electronic commerce, as has been in the case in the Philippines. While policies and laws have been in place in the Philippines to protect individuals from risks pertaining to privacy and

cybersecurity, especially with the enactment of the Data Privacy Act of 2012, and the National Cybersecurity Plan 2022, these have to be regularly revisited in the wake of possible implementation deficits in these laws.

Governments should understand the dynamics in the platform economy given the many challenges in enforcing regulations on cross-border trade in digital services and products, as well as the current ambiguities in laws on digital taxation (Bunn et al. 2020; World Bank 2020). Even prior to the onset of COVID-19, several Asia-Pacific economies, viz. Australia, Bangladesh, Japan, India, New Zealand, the Republic of Korea, Taipei, China, have had digital tax laws (Musgrove 2020). This 2020, Indonesia has introduced a 10% value added tax (VAT) on all online transactions, with no threshold which means from the very first sale; Malaysia is introducing 6% VAT on digital services for foreign providers whose services rendered exceeds the threshold of RM 500,000 (about USD$120,000) for a period of 12 months, while Singapore introduced VAT rate 7% to foreign suppliers of digital services whose annual global turnover exceeds SGD$1,000,000 and whose sale of digital services to consumers in Singapore exceeds $100,000 (Musgrove 2020). Given the need of governments for other revenues in the wake of expected deficits for fighting the COVID-19 pandemic, increasing social protection coverage, and rebooting economies, the Philippines is also looking into digital taxation with a proposed House Bill 7425[9]. Prior to COVID-19, the total e-commerce market in the Philippines was expected to reach US$1.09 billion this 2020 (Statista, 2019). With Lazada and Shopee that have headquarters outside the country dominating the e-commerce market in the Philippines, losses in possible value added taxes alone could be considerable. Some rules could be developed for platforms to readily share information, partly for governments to ensure that taxpayers and tax administrations get timely access to high-quality data that can enhance the direct tax compliance of sellers in platforms, and other tax obligations, especially VAT.

Policies need to be in place on the protection of consumer rights, that can enhance trust toward platforms, and specifically on digital payments. Encouraging platforms especially logistics and ride-sharing providers to only make use of digital payment instruments will require a strong consumer protection policy framework including a return and refund policy. Consumer confidence in the right to return a defective product and receive a refund can likely improve trust in digital payments. The difficulty is sometimes on the part of enforcement of laws. For instance, while the Consumer Act of the Philippines (or Republic Act 7394) provides for spelling out price tags of goods and services, providers may not do so, and instead resort only to negotiations on private messages with platform clients[10].

In the Philippines, with the onset of platform-based logistics services, land transportation of small parcels persistently faces regulatory challenges, including ambiguity as to which appropriate regulatory body should these logistics providers submit to. Governments need to

[9] http://www.congress.gov.ph/legisdocs/first_18/CR00426.pdf

[10] https://www.interaksyon.com/trends-spotlights/2020/06/01/169660/pm-is-the-key-dti-reminds-online-sellers-to-display-prices-on-online-platforms/

regularly revisit their laws, preferably coming up with a regulatory management system (Llanto 2015) and address ambiguities with urgency.

Logistics platforms are providing cheaper, and reliable logistics and transport services but many of these services in developing countries like the Philippines have only been limited in the major cities. Although e-tailers have adequate knowledge of available delivery options for goods, other online sellers that use social media platforms such as Facebook Marketplace and Instagram to reach their markets may not be as well-informed. Industry and the government should collaborate in collecting and disseminating information especially to micro-, small and medium enterprises to help them understand the vastly changing landscape that can reduce their costs, aside from increase their markets.

The COVID-19 pandemic has accelerated the shift towards online expenditure, providing a boost on the growth of digital delivery models, including online banking, online learning, and online entertainment. This shift in consumer behavior may continue in a new normal world as consumers increase their trust in platforms. Regulatory frameworks should address how to enhance safety and security, particularly, how to observe data privacy for protecting the personal information of consumers in platforms. A key characteristic of platforms is that they are in winner-take-all situations and markets. Even when barriers to entry can be low, it is possible for first movers to have large advantages because of the high switching cost in platforms, and this can pose significant issues in fair competition. While a regular review of regulations especially about platforms are in order, regulators must also remember the need for an enabling environment that promotes wealth creation. Regulations should not easily stifle innovative activity, but work toward ensuring that whatever benefits from platform use are ultimately shared within a country, so that prosperity can be more inclusive and sustainable especially in the new normal and beyond.

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