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Understanding the Costs and Benefits of Digital Platforms and the Implications for Policymaking and Regulation

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Abstract

This paper examines how digital platforms work and reviews their impacts across different sectors. We look at the experience of the Philippines and other countries focusing on e-commerce and ride-hailing/delivery service platforms. Government-initiated platforms and applications in agriculture were also discussed.

The review of the literature highlights the various positive and negative effects of digital platforms in achieving inclusive and sustainable economic development. The emergence of various digital platforms and the technologies that drive them will continue to shape our economy and society in ways that we cannot yet fully anticipate. How well we manage the risks and exploit the opportunities will largely depend on finding the appropriate role of the government in the platform economy and the quality of regulatory governance.

Keywords: digital platforms, platform economy, multisided platforms

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Understanding the costs and benefits of digital platforms and the implications for policymaking and regulation

Ramonette B. Serafica and Queen Cel A. Oren[1]

1. Introduction

Economic and social activities are increasingly taking place over digital platforms. According to Kenney and Zysman (2016), a "platform economy" or "digital platform economy" is one characterized by a growing number of digitally enabled activities in business, politics, and social interaction where a "platform" refers to a set of online digital arrangements whose algorithms serve to organize and structure such activities. The rise of the platform economy signifies the latest development in the ongoing digital revolution (Kenney, Zysman, and Bearson, 2020).

With the Covid-19 pandemic, various goods and services from basic food supplies to health and education have to be ordered, paid for, and delivered through digital platforms. Digital adoption and newfound habits are likely to continue even if mobility restrictions are lifted as consumers adjust to a new normal (Google Temasek 2020). Digital technologies and the proliferation of digital platforms will no doubt have profound impacts on the economy and society as they shape how value is created and distributed among the producers and users of such platforms.

Although the concept of a platform that connects different groups is not new (e.g., newspapers that link advertisers with consumers) and digital technologies such as the internet have been around for a few decades now, it is the marriage of the two that has made digital platforms disruptive in terms of being able to alter business structures, work arrangements, consumer behavior, and trade flows, among other things. These changes have implications on public policy issues such as taxation, income security and social protection, consumer protection, and competition, which in turn affects efforts to foster economic and social inclusion (UNCTAD 2018).

With the emergence of the platform economy, the challenge for policy and regulation is how to maximize the benefits and mitigate the risks of new technologies and business models. The next chapter will examine the nature of digital platforms to better understand what they are, how they work, and why specific regulations may be needed. An overview of major digital platforms in will be presented next to learn more about how they operate in specific industries. An approach to developing appropriate policy and regulatory responses will be discussed in the final chapter.

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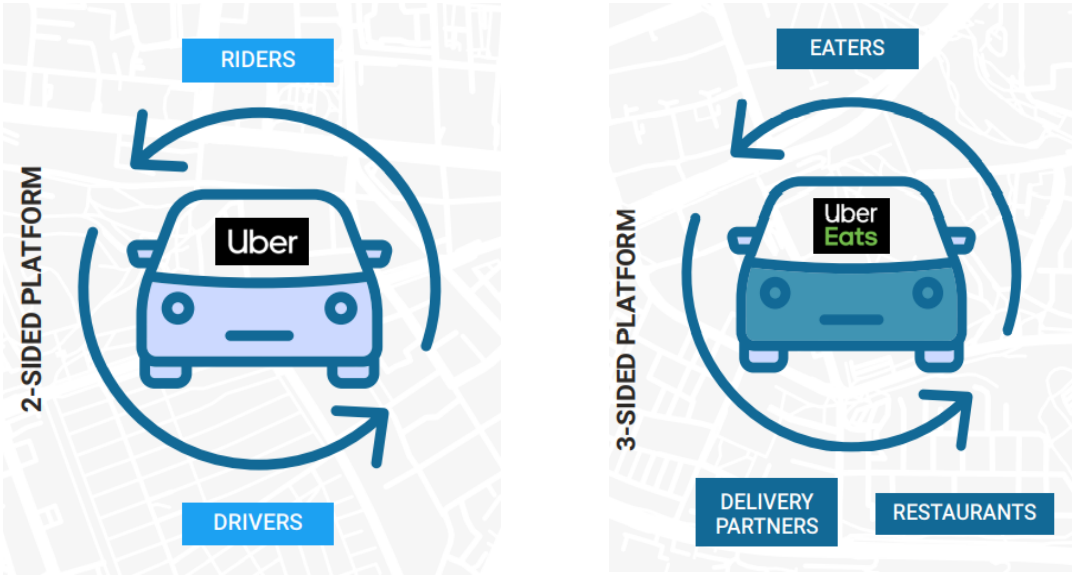
2. Overview of digital platforms

2.1 *Characteristics of digital platforms*

Although there is no consensus on a definition, according to Takagi (2020), digital platforms generally have these common features: (1) they connect two or more user groups, (2) they mediate the transaction between those users, and (3) mediation is conducted through digitalized services leading to strong network externality. Similarly, Albert (2020, p. 15) defined a digital 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". Thus, a platform enables two or more distinct types of participants to interact more efficiently and realize the benefits of such interactions. These groups need each other in some way but cannot capture the value from their mutual attraction without the help of an intermediary platform (Evans and Schmalensee 2007; Evans 2018).

As depicted in Figure 1, a two-sided platform such as the Uber app (or Grab in the case of the Philippines) connects drivers and riders while a multi-sided platform connects three or more groups of users (e.g., households, restaurants, and delivery partners in the case of food delivery apps; the users, content providers and advertisers in the case of search engines). Most apps include different payment services adding to the number of participants in multi-sided digital platforms.

Figure 1. Multi-sided digital platforms



Source: Ganchi and Anvari (2018)

A key feature of digital platforms is the presence of **network effects**, which means that as more users engage with a platform, the more attractive the platform becomes to potential new users (Evans 2016). Also called network externalities, network effects lead to demand-side economies of scale and positive feedback (Shapiro and Varian 1999). There are two kinds of network effects at play in multi-sided platforms - direct network effects and indirect network

effects. **Direct network effects** arise when the value of a platform to a user increases as the number of participants on the same side of the platform increases. For example, one would prefer to join a bigger or more popular social network platform, allowing more social connections to be established. **Indirect network effects** arise when the value of a platform increases with the number of participants on the other side of the platform. For example, one would prefer to use a food delivery app with more restaurants to choose from. Shapiro and Varian (1999) note that positive feedback enables "the strong to get stronger. But there is a dark side to the force: positive feedback also makes the weak get weaker" (p. 224). Network effects are not always positive as Table 1 shows.

Table 1. Network effects of digital platforms

	Positive	Negative
Direct Network effects or within-group effects	Users experience a higher value if there are more participants on the same side of the platform e.g. – They like all their friends to be on the same social media platform.	Users experience a lower value if there are more participants on the same side of the platform e.g. – Bidders for these goods on the internet auction websites experience more competition
Indirect Network effects or Cross-group effects	Users experience a higher value if there are more participants on the other side of the platform e.g. - To allow them to use a payment mechanism	Users experience a lower value if there are more participants on the other side of the platform e.g. - They may dislike advertising

Source: ITU & WB (2020, p. 30)

Another characteristic of digital platforms is the presence of **economies of scale**, which allows the platform owner to expand the user base at low marginal cost. This can be a result of the high share of upfront investments in infrastructure such as data centers, software development, and license fees (e.g., to stream content), which do not increase proportionally when the number of users or subscribers increases. Although other industries may also enjoy economies of scale, Van Eijk, et al. (2015, p. 14) note that "the effect is more pronounced for digital platforms as the marginal costs are often close to zero."

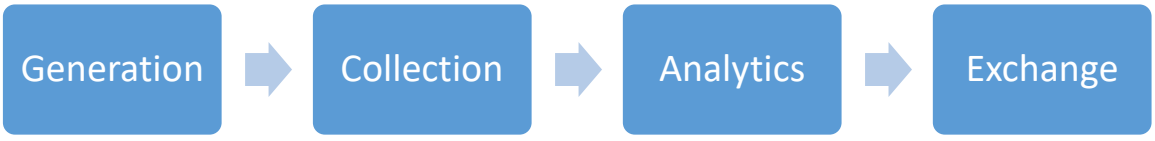
The economies of scale in production (or supply-side economies of scale) are different from the economies of scale from the demand side. Although both types of economies of scale are not new, many information technology industries tend to be characterized by both. According to Shapiro and Varian (1999, p. 182), this results in "a 'double whammy' in which growth on the demand side both reduces cost on the supply side and makes the product more attractive to other users—accelerating the growth in demand even more. The result is especially strong positive feedback, causing entire industries to be created or destroyed far more rapidly than during the industrial age."

The digital nature of platforms today explains much of the disruption in industries and society. The platforms today are digital which means they can easily capture, transmit, and monetize data, including personal data (Evans and Gawer 2016). Digital technologies such as the internet have created powerful technologically enabled networks or marketplaces that significantly

lowered the cost of acquiring and using information, thus, lowering transaction costs and production costs. From an economic perspective, the shift in cost can be characterized into five types, namely (Goldfarb and Tucker 2019): (1) **Lower search costs** – digital technology makes it is easier to find and compare information about potential economic transactions which could lead to lower prices and lower price dispersion, variety, and better matching; (2) **Lower replication costs** – digital products can be replicated at zero cost, which means they are often non-rival since they can be consumed by one person without reducing the amount or quality available to another. Information, in particular, can be shared without diminishing the original information; (3) **Lower transportation costs** – the importance of geography is diminished in a digital world as the cost of transmitting data over the internet or the cost of distribution for digital products is near zero; (4) **Lower tracking costs** – since digital activity is easily recorded and stored tracking costs are lower which enables customization and the creation of one-to-one markets as well as personalized pricing and advertising; and (5) **Lower verification costs** – with digital verification it is easier to certify the reputation and trustworthiness of different market participants.

The generation and analysis of data is critical to the business model of digital platforms (OECD 2019, UNCTAD 2019). While it is not a unique feature of digital platforms, together with network externalities, the amount of data generated is one of the distinguishing features of its business model. Thus, digital platforms "act as intermediaries that bring together different players in the data value chain: customers, advertisers, service providers, producers, suppliers, and physical objects" (GSMA 2018, pp 39-40). The data value chain is composed of discrete steps as depicted in Figure 2. The first step in the value chain is generating or acquiring the data which could come from different sources (i.e., internally generated or obtained externally) or may be actively or passively created by a human, a sensor or generated by the system. The form of the data may also be structured or unstructured. Data is created for example, whenever a user posts an update on a social media platform. The second step involves collecting data, validating and storing it. At the collection stage the data must be transmitted from its capture point to where it is being stored using some type of networking infrastructure. Processing and analyzing the data to generate new insight and knowledge is the third step in the value chain. The final step involves putting the insights and knowledge generated to commercial use to realize the value created. (GSMA 2018)

Figure 2. Data Value Chain



Source: GSMA (2018, p. 13)

The data and insights could be used internally to develop new products or customized services or sold to external parties without necessarily sharing the underlying data (See Table 2).

Table 2. Types of data uses and trades

Exchange type	Examples of specific uses
Own use (Non-traded)	**Revenue optimization** – insights from data can be used in many ways to drive growth including the ability to improve product offerings, enter new markets, change distribution channel strategy and target consumer segments. **Cost optimization** – the use of IoT is revolutionizing the understanding that businesses have of their own operations. **Product creation** – the development of services based on artificial intelligence, with the need for data to train any machine learning capabilities.
Trading-in	**Market intelligence** – data relevant to a company's markets including the external environment. This can be used for decision-making in determining a strategy. Very few firms can generate sufficient data themselves. However, a number of data aggregators who operate in this area sell the data directly to businesses and other organizations.
Trading-on	**Marketing and advertising** – data insights based on customer transactional and behavioral data from multiple sources such as social media profiles, demographic information, online browsing history and previous purchases give marketers and advertisers a head start in their ability to reach the right audience at the right time. Conversion rates indicate the value of the data. **Market-making** – this is the growing business model adopted by many internet businesses who match the needs of buyers and sellers through a platform. AirBnB, Uber and Tinder are all good examples. Scale is very important as the liquidity of the market created by the platform is a key feature demanded by users and in most cases there are strong direct and indirect network effects.

Source: GSMA (2018, p. 24)

The nature of the data collection by digital platforms results in economies of scale and network effects which, once a tipping point is reached, lead to i) a winner-take-all industry structure where the large get larger, ii) vertical integration which enables platforms to collect more data from different upstream and downstream affiliates and users, and iii) expansion to adjacent market segments as data-driven platforms extract commercially valuable insights from the large data sets in their possession. As such, there are public concerns about the risks to data privacy, abuse of market power, and conglomerate effects due to the competitive advantage derived from access to a wealth of data that cannot be matched by competitors. (GSMA 2018)

According to Julien and Sand-Zantman (2020, p.5) however, "monopoly is not the only possible outcome for platform competition." Platform differentiation, multi-homing, and interoperability can still prevent a market that exhibits network effects from tipping. Users may be willing to switch to a smaller platform if it has unique features or services not offered by others. Being able to multi-home can also mitigate tipping since users can subscribe to more than one platform to enjoy large network effects and the services of different platforms. Lastly, interoperability means that even smaller platforms can offer the same level of network effects as the bigger platforms, thereby intensifying competition.

2.2 *Types of digital platforms*

Various classifications have been proposed to differentiate the multitude of digital platforms that have emerged (Albert 2020, OECD 2019; UNCTAD 2017). As Albert (2020) explains, digital platforms can be organized using one or several criteria and the classification adopted ultimately depends on the purpose of the analysis. Based on the likely interactions that could be arranged, Ardolino et al (2016) suggested four types of platforms. A **matchmaking platform** such as a dating or job-seeking platform aims to match users based on their expectations. An **external exchange platform** such as a website for classified ads matches requests of users but the transaction is carried out outside the platform. In an **exchange platform** such as a marketplace the transaction between the users and all the activities related to the transaction is managed through the platform. A **maker platform** such as a desktop operating system facilitates interactions by providing the appropriate tools or instruments to make other products.

Following Evans and Gawer (2016), Koskinen et al. (2019) created three types according to the functionality and value creation of digital platforms. A **transaction platform** enables users to find each other more easily. It facilitates seamless transactions among them thereby minimizing transaction costs. Most of the largest digital platforms in developing countries are considered transaction platforms. **Innovation platforms** are used for the creation of other products or services. **Integration platforms,** such as Apple, Google, and Amazon exhibit both characteristics of the two afore-mentioned types of platforms (Evans and Gawer 2016).

Kenny and Zysman (2016) identified different platforms such as retail platforms, platforms providing services, platforms that mediate work, and platforms providing digital tools to other platforms. An example of the last type is a smartphone operating system which is considered a foundational platform. In all the categories, algorithms underpin online activity.

2.3 *How platforms and platform workers earn*

A platform can also be categorized based on its core revenue-generating business. Examples include (GSMA 2018, p. 40):

- Advertising platforms (e.g., Facebook) – these are characteristic of many social media players. They use their detailed knowledge of users to enable advertisers to target users that fit selected criteria.

- Cloud storage and processing platforms (e.g., Salesforce) – these organizations operate as Software-as-a-Service (SaaS) or Platform-as-a-Service (PaaS) and therefore link business with third party developers through an application programming interface

- Product platforms (e.g., Spotify) – turn traditional good into a service and collect rent

- Lean platforms (e.g., Uber, AirBnB, ride-sharing apps) – these enable asset sharing between asset owners and users without the platform taking on responsibility for the asset themselves.

Similarly, Peitz et al. (2014) as cited in Serafica, Rosete, Camaro, & Salvanera (2020, p. 50) identify revenue models for online service providers:

- Subscription model - end users pay for the provision of a service. For example, Netflix where users pay a fee access movies or Spotify for music.

- Advertisement model - end-users access the service for free since the platform is sustained by advertising revenues. For example, users of YouTube or Facebook have access to free contents and are exposed to advertising.

- Access model - content or app developers pay the platforms to reach end-users. For instance, the App store is a digital store where developers can place their applications to reach iOS users.

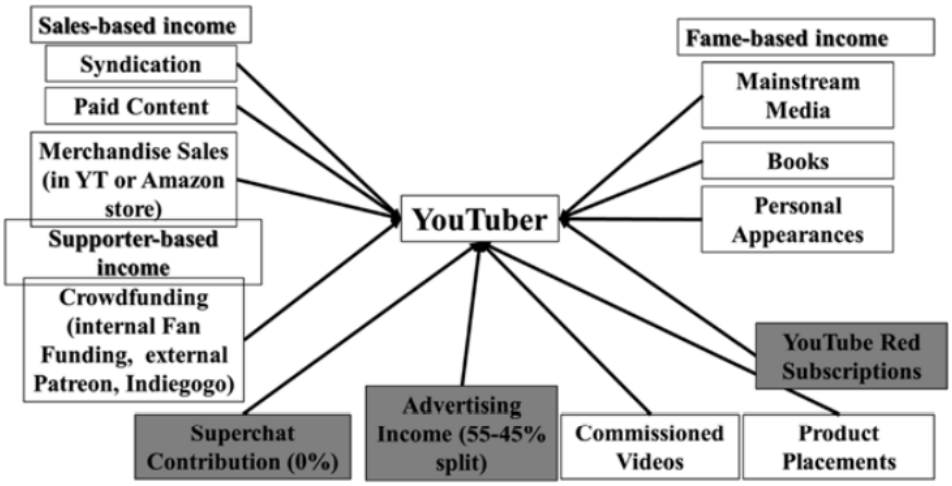
Various typologies of labor platforms have been proposed as well, for example distinguishing between crowdwork vs. on-demand work, micro- vs. macrotasks, or web-based vs. location-specific work (See Bayudan-Dacuycuy et al. 2020). A taxonomy that examines work and value creation in the platform economy was developed by Kenney and Zysman (2019), which shows the relationship of platforms, employment and compensation. They distinguish between work within the platform companies and work on the platform ecosystem. The former is composed of workers for the platforms who create and maintain the platforms. The latter covers the larger workforce being organized into the labor markets by these platforms. This group is further sub-divided into those undertaking platform-mediated work and those undertaking platform-mediated content creation. **Work at the platform firms** is performed by two groups: venture labor composed of direct or core employees and large numbers of contractors and temporary workers hired through different channels. These sub-contractors may be working on- or offsite or based locally or overseas performing data related work for the platform such as moderating content. **Platform-mediated work** include those involved in marketplaces (e.g., work in distribution centers or warehouses), provide services in-person (e.g., drivers in ride-hailing platforms), and those who provide services remotely (e.g., virtual assistant). **Platform-mediated content creation** may involve user-generated content in which producers monetize the content uploaded to platforms, non-platform content created through websites, and user-generated content from posting information or interacting on platforms. See Table 3. Kenny and Zysman (2019, p. 27) assert that "Without content, no engagement, no users, no data, and no value creation are created." For consignment content providers, the creator who uploads the material assumes all the risks but the exposure to a wider audience through the platform enables creators to develop other income streams as illustrated in Figure 3 in the case of Youtubers.

Table 3. Labor Force Distinctions in the Platform Economy

Platform Type	Employment Type	Typical Examples	Compensation Type	Labor Conditions	Value Creation Process
Platform firm					
Venture labor	Full time	Google, Amazon, Facebook, Snap, Airbnb	Salary and stock options	Excellent	Creating and maintaining platform
Contractors (provide service to platform firm but not employees)	Full or part time	Dynamex, LeapForce	Salary or by job	Precarious, mostly low wage	Routinized
Platform-mediated work					
Platform-mediated marketplaces	Independent or contractors	Amazon, Craigslist, eBay, Etsy	Salary or by job	Low wage or precarious	Direct work including logistics
Platform-mediated in-person service provision	Contracted service through platform (contested)	Uber, Airbnb, Lyft, PostMates, GrubHub	Normally, but not always, set by platform	Gig, low income	Provide service, sometimes monetize asset
Platform-mediated remote service provision	One-time project contract	Upwork, Fiverrr, InnoCentives, Amazon Mechanical Turk	Agreed upon by job	Gig, low income	Project work
Platform-mediated content creation					
Consignment content creators	Not employed	YouTube, Apple App Store, Google Play	Income from sales or share of advertising	Skewed, with few having large returns	Content creation
Non-platform organization content producers (e.g., websites)	Employed or contractors	All organizations with a web presence	Salary or by the job	Varies widely	Build websites, etc., for their firms
User-generated content	Not employed	Google, Facebook, Yelp, Snapchat	Use of the platform	N/A	Produce data from which value is extracted

Source: Kenny and Zysman (2019, p. 16)

Figure 3. Various sources of income for YouTubers on any other platform



Note: Gray boxes are income sources directly through YouTube
Source: Anable and Kenney (2017) as cited in Kenney and Zysman (2019 p. 31)

With the different types of workers in the ecosystem, it is not easy to characterize the nature of work and quantify the number of workers. Moreover, successful platforms will generate several ecosystems of firms and workers with various types of work arrangements and compensation schemes. The taxonomy however provides an analytical framework to understand the platform economy and its implications for work (Kenny and Zysman 2019).

3. Opportunities and Risks

The ability of digital platforms to match demand and supply for goods and services in a much faster, cheaper and better-coordinated manner has created opportunities for households and MSMEs to participate in the digital economy and allowed for new types of trade to flourish (e.g., in digitally traded products, services and tasks) (UNCTAD 2018). Studies have been conducted on the economic impacts of digital platforms which Takagi (2020) grouped into five themes. See Table 4.

Table 4. Survey of the literature on the economic impacts of digital platforms

Theme	Focus
Labor	Examine the impacts on work arrangements, incentive mechanisms, and types of labor employed. They also attempt to measure the size of the platform economy based on the number of jobs created.
Incubation	Look at how digital platforms enable entrepreneurs and small start-ups to expand their businesses. Difficulties with respect to individual negotiation, platforms unilaterally changing rules, and unfair conditions in terms of cancelation and penalty have also been studied.
Consumption	Examine how digital platforms affect consumer behavior, whether they lower consumer demand or promote consumption (including conspicuous consumption), and the impact on consumer surplus.
Destruction	Analyze the impact of digital platforms on traditional industries (e.g., brick and mortar shops and bookstores, taxis, hotels).

Wealth distribution	Look at the global reach of digital platforms and the corresponding impacts on the distribution of wealth and the tax implications of cross-border transactions.

Source: Takagi (2020)

Other studies have focused on competition issues which are analyzed not just from an economic lens but from a legal perspective as well (Takagi 2020). In Serafica, Rosete, Camaro, & Salvanera (2020) possible bottlenecks and constraints to competition are identifed in the Philippine digital commerce market using a distribution channel model, which takes into account the vertical and horizontal relationships among the firms in the ecosystem. The regulatory constraints to competition are also highlighted.

The opportunities and risks could also be assessed by type of platform. Bayudan-Dacuycuy et al. (2020a, 2020b) examine the patterns and issues in online work, which have expanded income opportunities especially for women and the youth. However, the lack of income security and social protection were identified as critical issues with this type of work arrangement. Other opportunities and risks that have been examined in the case of platforms engaged in e-commerce and ride-hailing and delivery services are presented below.

3.1 *E-commerce*

Serving as online marketplaces for buying and selling various international and local products while adding value to customers through promos, deals, and sales, Lazada and Shopee became the two most popular e-commerce platforms in Southeast Asia. At the same time, Tokopedia is one of Indonesia's most popular e-commerce, created mainly for small- and medium-sized enterprises (SMEs) to sell their product online for free (Sutikno et al. 2019). See Table 5

Table 5. Popular E-commerce Platforms in Southeast Asia

Platform	Year Founded	# of employees	HQ	Markets served	Number of users
Lazada	2012	5001-10000	Singapore	Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam	350,000 merchants as of 2020*
Shopee	2017	51-100	Singapore	Singapore, Malaysia, Thailand, Taiwan, Indonesia, Vietnam, the Philippines, and Brazil	200,000 sellers in the Philippines as of 2018
Tokopedia	2009	1001-5000	Indonesia	Indonesia	4,000,000 merchants as of 2018

Note: *number of brands and sellers across Southeast Asia joining 11.11 One-Day Sale on November 11, 2020.
Source: data from Crunchbase.com accessed on August 27, 2020, CB Insights database, https://www.lazada.com/en/about/, https://news.yahoo.com/more-350-000-brands-sellers-034500806.html?guccounter=1, https://businessmirror.com.ph/2018/02/17/shopee-sees-growth-in-local-mobile-shopping-in-2018/, and https://kr-asia.com/tokopedia-now-9-years-old-hits-4-million-merchants (accessed on December 14, 2020)

Lazada, Shopee, Zalora, and eBay are the top four (4) international e-commerce platforms in the Philippines. Homegrown e-commerce, BeautyMnl, Galleon, and O Shopping were in the top 10 from the 2nd quarter of 2019 to the first half of 2020. During this period, Argomall (homegrown technology e-commerce), Youpoundit (homegrown e-commerce - technology), and Zeus (homegrown e-commerce - fashion) were replaced by Iherb (international e-commerce - others), Ubuy (international e-commerce - general), and Kimstore (local tech). BeautyMnl is the leading online beauty marketplace in the Philippines, and its largest homegrown e-commerce website. It received funding from Openspace ventures based in Singapore. From May 2020 to June 2020, it recorded 49.33% visit growth for mobile and desktop websites with 882,182 monthly website visits in June 2020. See Table 6.

Table 6. Top 10 e-commerce in the Philippines based on monthly website traffic

Q2 2019			Q2 2020		
Merchant	**Category**	**Location**	**Merchant**	**Category**	**Location**
Lazada	general	international	Lazada	general	International
Shopee	general	international	Shopee	general	International
Zalora	fashion	international	Zalora	fashion	International
eBay	general	international	eBay	general	International
Argomall	tech	Philippines	BeautyMnl	cosmetics	Philippines
BeautyMnl	cosmetics	Philippines	Galleon	general	Philippines
O Shopping	general	Philippines	O Shopping	general	Philippines
Galleon	general	Philippines	iHerb	others	International
Youpoundit	tech	Philippines	Ubuy	general	International
Zeus	fashion	Philippines	Kimstore	tech	Philippines

Source: based on data from https://iprice.ph/insights/mapofecommerce/en/ accessed on October 21, 2020.

Some government agencies in the Philippines have created e-commerce websites and mobile apps to support SMEs, farmers, and science and technology innovation. GoLokal, a market access platform initiated by the Department of Trade and Industry (DTI) in partnership with retail establishments consisting of malls, stores, and retailers, helps MSMEs promote Filipino products for free in GoLokal stores and virtually through its partnered e-commerce platform, Shopinas. Since Golokal's establishment in 2016 (Del Rosario, 2018), it grew to have 58 GoLokal stores, 350 participating MSMEs, and over 80 successfully running MSMEs in the mainstream market in 2018 (Crismundo 2018). After two years, the number of GoLokal stores doubled up to 114 nationwide, with 478 MSME members and 100 MSMEs already being regular suppliers of private retail stores (Golokal n.d.). Additionally, it has accumulated 16,386 followers on Facebook.

OneSTore.ph, which started in July 2015 (Galvez 2020), was launched by the Department of Science and Technology (DOST) in partnership with the Filipino Inventors Society Producers Cooperative (FISPC) to market indigenous products in all regions of the country for free. It was not only created as an e-commerce website for MSMEs but also aims to provide OneSTore Hubs in all regions in the Philippines as physical stores for startup businesses (Ronda 2017).

OneSTore also has a Facebook page with 11,491 followers as of the start of November 2020. In June 2020, DOST released OneSTore mobile app to make online purchases more efficient for consumers by providing them with the choice of delivery services and a map showing available MSMEs near them. There are 28 OneSTore hubs nationwide, with about 360 participating MSMEs offering around 12,000 products, where more than 50% are food products (Arayata 2020).

Created in July 2016, OneExpert provides technical advice and services to public consumers, including entrepreneurs, farmers, fishers, employees, researchers, and students. This platform connects the public to DOST registered science and technology experts and consultants anywhere in the Philippines (DOST Region XI, 2016) (DOST Region XI, 2016). Its services include assisting MSMEs with processes and product improvement and providing them with free technology training to increase business innovation, efficiency, and profitability. It currently has 2,268 followers on Facebook as of November 2020 (Oneexpert n.d.).

Agriculture e-commerce named eKadiwa was launched by the Department of Agriculture (DA) with the help of the private sector in May 2020. Currently, consisting of 25 retailers, it allows farmers and agripreneurs to sell products directly to consumers in Metro Manila. It also envisions expanding across all regions in the country. Mober, Inc. provides the delivery services at a flat rate of 150 pesos. Ride-hailing or delivery services apps like Lalamove and Grab also expressed their interest in joining (DA Communications Group 2020a). As of the end of October 2020, it garnered 143 followers on Facebook.

Another e-commerce agriculture platform, named Deliver-e, was officially launched on December 14, 2020, connecting producers to consumers to access fresh and cheaper products and promises seamless delivery of food supplies during the new normal. It was made possible by collaborating with DTI, DA, private sectors, farmers, the United States Agency for International Development (USAID), and Insights Supply Chain Solutions, a local logistics technology startup company (DA Communications Group 2020b). Table 7 provides a summary of the government-initiated platforms.

Table 7. Government e-commerce platforms

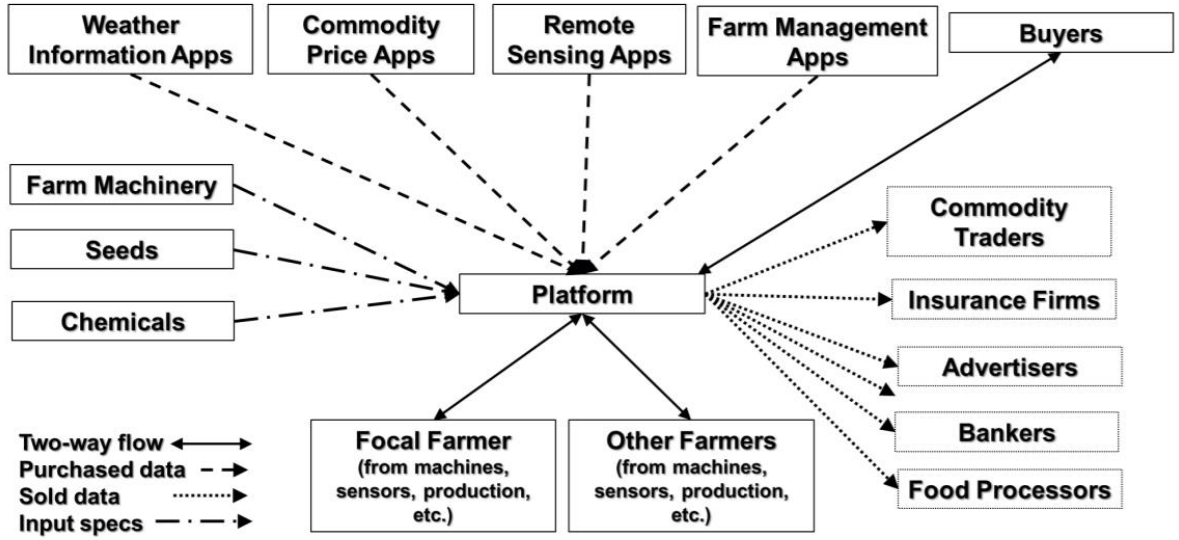
Government Initiated Platform	Year Founded	Agency	Description	Facebook followers as of 02 Nov 2020
GoLokal-Shopinas	2016	Department of Trade and Industry	Connects MSMEs and consumers	17388
OneStore	2015	Department of Science and Technology	Connects MSMEs and consumers	11491
OneExpert	2016	Department of Science and Technology	Connects Science and Technology (S&T) experts and MSMEs	2268

eKadiwa	2020	Department of Agriculture	Connects farmers and consumers	145
Deliver-e	2020	Department of Trade and Industry, Department of Agriculture	Connects farmers and consumers	N/A

Sources: Del Rosario (2018), Galvez (2020), DOST Region XI (2016), DA Communications Group (2020a), and DA Communications Group (2020b).

Digital platforms can help improve productivity and incomes in the agricultural sector. As described by Kenney, Serhan, & Trystram (2020), farms generate enormous amounts of data which could be aggregated and analyzed to provide valuable information and insights for the different participants in the ecosystem. Attracting more users will make the gathered data more accurate. Adding data other than those generated from the farms such as weather information and commodity prices, remote sensing, inputs from chemical and seed industries, and standardizing enormous data coming from different parts of the agriculture ecosystem will lead to greater efficiency and productivity in the farming sector ecosystem (See Figure 4).

Figure 4. Data Flows through an Agricultural Platform



Source: Kenney, Serhan, & Trystram (2020)

Asian countries such as China, India, Nepal, Malaysia, and Thailand have already started using e-commerce to innovate agriculture. At least five (5) modes have been successfully utilized to increase farmers' net income in some rural areas in different provinces in China. These are government-driven mode, service provider driven mode, rural entrepreneurship driven mode, small-holder dominated mode, and cooperatives mode (Zeng et al. 2017). See Box 1.

Box 1. Agri-food E-commerce development modes utilized in China

Cheng county, known for some products like garlic, honey, and pork, exhibited the government-driven mode. Their governor became hands-on in providing ways to increase their profitability by selling in microblog online, making policies, engaging with media, educating farmers, forming e-commerce association, and building services stations for online selling in partnership with a private company. They already have seen impressive growth in just two years since 2013. They generated 676 online shops and a revenue of 370 million RMB.

Farmers in Tongyu county have utilized service provider mode. They have no prior knowledge about using e-commerce, are geographically disadvantaged, and lack resources. Yunfeihewu e-commerce company (YEC) helped them become more marketable by branding their products, standardizing production, packaging, and selling them online.

Rural entrepreneurship driven mode was successfully implemented for a county in China with good quality of environment and agricultural products yet small production scale. An entrepreneur created an association to provide strategic advice to farmers and promote e-commerce agriculture. A member enterprise had also set up e-commerce stations helping farmers sell online.

The other two modes are considered village level: Small-holder dominated where farmers directly sell their products online through Alibaba company and a cooperative oriented mode where farmers collaborate and sell their products through their website, another private service provider, or government-initiated websites

Source: Zeng et al. (2017)

Additionally, there are five platform business models or ownership in agriculture presented by Kenney, Serhan, and Trystram (2020). **Venture capital-funded startups** see potential in digital platforms to reorganize agriculture industries and intermediate between farmers, food processors, distributors, and consumers. They also integrate data from farmers for monitoring, analysis, and decision-making process. **Established agricultural input firms** already have provided equipment and other inputs to farmers and can easily add digital services to their existing products. However, the disadvantage is that firms may use the data other than the intended purpose due to data collection and analysis uncertainty. **Agricultural cooperatives** are also developing platforms on their terms. They could sell their data with other agriculture system players, share technology, knowledge, and equipment to optimize their resources and decrease costs, and allow members to sell products and services online. This type of business model is less risky in terms of conflict of interest and data ownership since the overall generation of income comes back to the members. Smart Dairy in the Netherlands, an example of **specially formed entities** that can create digital platforms, was initially composed of research organizations, universities, dairy cooperatives, equipment suppliers, and dairy farms, establishing a single platform where farmers could contribute data and get data-based recommendations. They outsourced a data-broker platform, which serves as a clearinghouse but does not own the data. Fifteen thousand dairy farms were connected to share data with banks, insurance firms, production cooperatives, machinery firms, and milk processors. Additionally, **internet giants** have started taking roles in digitalizing the agriculture industry and further supporting this type of e-commerce. Some examples are Microsoft, offering

farmers data-based insights through launching FarmBeats; Google, investing in various agriculture startups; and Amazon, providing cloud computing to firms in the agri-food system.

Agricultural platforms can potentially scale up the agricultural sector and empower farmers, especially from regional parts of the country, by promoting market development, increasing farmers' awareness of market prices, providing them access to consumers both local and international offers, and eliminating intermediaries (such as wholesalers, retailers, and resellers) between producers and consumers to increase their profit. Although digital platforms seem to be a good investment contributing to innovation and productivity in the agricultural sector, overcoming many hurdles is essential for this technology tool to generate profit (Asadihkoob and Ebrahimi, 2014).

Other than issues with IT infrastructure for connectivity and communication technology tools such as farmers owning computers or mobile phones to access the internet, good road infrastructure must be built and maintained to facilitate the efficient delivery of inputs and products from one place to another. While these issues are not yet sufficiently resolved, the country cannot proceed to tackle other more complex issues arising in the use of e-commerce for agriculture. Culture should also be changed for the farmers to shift from traditional business processes to using computers or mobile phones and selling online. They will need training and assistance throughout the application process. This would be challenging given the literacy rate of farmers in rural areas and the rapidly evolving digital technology they must adapt to. The younger generation can use digital technology and be trained in e-commerce to provide employment to youth in agricultural provinces. Moreover, consumers should also be introduced to the use and advantages of e-commerce in agriculture for them to support it. The lack of trust in digital transactions should also be addressed to increase consumer participation (Asadihkoob and Ebrahimi 2014).

According to Kenney, Serhan, & Trystram (2020), many startups are seeking to become agriculture platforms. However, in each sector, only one or two typically survive. The effect of platforms on agriculture is still limited since no existing business model can dominate the market yet. Platform sustainability must be considered before farmers embrace digital platform services. Otherwise, the technology will not be supported or upgraded, and investment returns will not be realized. Although this innovation is beneficial to farmers, since consumers can directly buy products from the farmers through platforms, the success of agriculture e-commerce poses a risk of disintermediating local farm suppliers and distributors. They would have to change their role in the agricultural system or transfer to other sectors.

3.2. Ride hailing and delivery services

Ride-hailing platforms have evolved into multi-service platforms, enabling the delivery of various items such as food, grocery, and even pharmaceutical products. Grab offers GrabTaxi, GrabBike, GrabCar, GrabShare, GrabHitch, GrabShuttle, and GrabCoach. In 2015, it entered the marketplace with GrabExpress and GrabFood delivery services for parcels and food. After six months, it launched an in-app mobile payment called GrabPay and added GrabRewards in 2017, where customers can redeem points for the use of its services (Grab 2018). It operates in

Singapore, Vietnam, Philippines, Myanmar, Thailand, Cambodia, Malaysia, and Indonesia. Worldwide, Grab already has about 2.8 million drivers recorded as of 2019 apart from its direct employees of about 5,000 in 2018. In terms of Fintech, 77% of Grab transactions are conducted via GrabPay, and 53 million merchants accept GrabPay card (Smith 2020a).

GoJek, a popular mobile transportation platform in Indonesia, also operates in Vietnam, Thailand, and Singapore, with about 2 million drivers and more than 5,000 employees. It is also considered a super app like Grab, providing various services such as e-payment, food delivery, transportation, and logistics (Smith 2020b). Lalamove, previously a logistics company for van rentals, extended its services to 'door to door' deliveries of goods across China and Southeast Asia. It was founded in 2013 and headquartered in Hong Kong, with about 1.67 million monthly visits. 25% of its web traffic comes from the Philippines (SimilarWeb 2020). See Table 8.

Table 8. Popular Ride Hailing and Delivery Platforms in Southeast Asia

Platform	Founded date	# of employees	HQ	Market	Number of users
Grab	2012	10001+	Singapore	Singapore, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Vietnam	2,800,000 as of 2019
Lalamove	2013	501-1000	Hong Kong	Hong Kong, Taipei, Singapore, Kuala Lumpur, Manila, Cebu, Pattaya, Bangkok, Hanoi, Ho Chi Minh City, Jakarta, Pune, Delhi, Chennai, Mumbai, Hyderabad, Ahmedabad, Bengaluru, Sao Paulo, Rio de Janeiro, Mexico City, Dallas, Chicago, and Houston.	700,000 driver partners (no date)
GoJek	2010	5001-10000	Indonesia	Indonesia, Vietnam, Thailand, and Singapore	2,000,000 driver partners and 500,000 GoFood merchants (no date)

Notes: HQ – headquarters
Sources: Crunchbase database, Smith (2019a), Smith (2019b), https://www.grab.com/sg/locations/, https://www.lalamove.com/global/about-us, and https://www.gojek.com/sg/about/ (accessed on December 19, 2020).

In the Philippines, in addition to Grab, **Angkas**, a motorcycle-hailing service in the country, not only aims to provide alternative transport services but also to improve public safety. Applicants need to pass the free training before becoming an Angkas driver. In November 2018, the company added a motorcycle ambulance service, Ambucycle, to its services by

training volunteers to be paramedics to deliver first-aid response in emergency cases and immediate transport of doctors to patients. Full-time and part-time drivers daily earn PhP 1500 and PhP 800, respectively. Drivers have flexible working hours and can pursue other personal interests and goals (Reyes 2018). **Micab** started as an SMS-based taxicab hailing in Cebu City in 2012. UP Cebu Business Incubation for IT (UPCeBuInIT) further improved its taxi system in 2015 by providing technology to manage fleets and creating a taxi-hailing app for customers. In 2018, it already consisted of 50% (about 3,000 taxicab fleets) taxis in Cebu City, 2000 in Metro Manila, 700 in Iloilo, 500 in Baguio, and soon will be available in Cagayan de Oro, Davao, and Bacolod (Lontoc 2018). **Keri delivery** is a Filipino startup online delivery services company offering same-day deliveries (Padala), queuing services (Papila), and purchasing services (Pabili). They are operating in selected South areas of Metro Manila (such as Paranaque, Muntinlupa, and Las Pinas), Cavite, and Laguna. Keri drivers are given performance incentives and life and accident insurances on top of earnings from delivery services (Keri Delivery n.d.). After a 40-day launch since June 16, it has recorded 5000 app downloads.

Ride-hailing services have created economic opportunities for SMEs and households. In Indonesia, the average income per month of Grabbike partners doubled from IDR 1.9 million (PhP6,200.86) to IDR 4 million (PhP13,054.45) while Grabcar partner's income increased by 114% from IDR 3.3 million (PhP10,769.92) to IDR 7 million (PhP22,845.28). For Grabcar and Grabbike, 25% and 33% of the partner drivers, respectively, had no income prior to joining the platform while 38% and 33%, respectively, had no income prior to Grab employment. Companies like Grab provide more opportunities for age groups 40 and above (Damuri et al. 2018). Grab, a ride-hailing company in Southeast Asia, started its service in the Philippines by providing GrabTaxi in August 2013 (Paronda et al. 2016). Since then, the company extended its operations to the major cities in the country: Manila, Cebu, Davao, Bacolod, Iloilo, Baguio, Cagayan de Oro, and Pampanga, adding services for transportation and delivery such as GrabCar, GrabShare, GrabExpress, and even GrabTrike (available in Angeles City, Pampanga). Grab PH country head also emphasized that Grab was able to ease the lives of riders by reducing travel time by 70% of public transport commuters. Partnered drivers earn 35% more than the average worker in the country. Apart from this, they also receive benefits such as life, car, and health insurance, fuel discounts, car maintenance, and discounts (Cu 2017).

Gojek began as a call center for motorcycle ride-hailing in Indonesia in 2010. It released a smartphone application in 2015 that provided three services: GoRide, GoSend, and GoMart. Currently dubbed as a Super-app, with more than 20 services on its platform, GoJek has expanded its market in the Southeast Asia region to include Thailand, Singapore, and Vietnam with plans to enter the Philippines. A study conducted by the University of Indonesia in 2018 estimates the contribution of Gojek to the economy at $3 billion. With sales of around $1.57 billion, the partnership between GoFood and Micro, small and medium-sized enterprises (MSMEs) account for the biggest share. For Gojek services such as Go-Car Go-Ride, and Go-Life, the educational attainment of workers is not an essential factor as more than 70% of partners in Go-ride, Go-car, and Go-Life have a high school diploma or less. Gojek partners

earn more than the average income in the nine (9) regions studied, with an improved average income of 45%, 42%, and 19% for Go-ride, Go-Car, and Go-life, respectively. Go-Life, which provides labor services such as house washing, salon, and massage, is made up of 70% female staff. More than 90% of Go-life partners experienced an increase in income and customers and received more training. 93% of MSME partners were able to digitize through GoFood. Also, 93% increased purchase volume and 55% of MSME partners' profits increased with the help of Gojek. Gojek partners said that their income is enough to provide for their families. Also, they save more time for family and enjoy work flexibility. It has also provided them with benefits such as digital marketing and e-payments (Walandouw et al. n.d.).

Despite these benefits, ride-hailing services face several issues. In Indonesia, GoJek has been criticized for avoiding employment laws since they consider participants as partners rather than employees. Gojek has responded to this issue by launching Swadaya Program, which gives participants the opportunity as drivers and merchants and provides them with benefits like health insurance, mortgages, education saving, and access to banks. Despite this, participants are still not able to form unions and participate in the company's decision-making process (Utami 2019). On December 17, 2020, Gojek, including all other app-based transportation in Indonesia, was banned for not meeting road traffic and transportation requirements but it was lifted the next day due to public complaints (Prananda, YinFah, Chen, & Chuen, 2020). Gojek, Grab, and Uber established their respective cooperative or company to comply with stricter regulations set by the Ministry of Transportation. They are also not allowed to recruit drivers directly but should work with registered public transport companies and disclose data to the Ministry of Transportation. Despite this, the legal issues remain unresolved. The government acknowledged that these app-based transportations have support from the commuters and banning them would cause public complaints (Honan and Ford 2017).

In China, Didi drivers were confronted with safety issues. Regular taxis have a glass-case fitted around the driver seat to protect the driver from passenger assault, but it is not the same for Didi drivers. Though they can call the police, damages could be done to their car and the passenger could still give them negative review. Additionally, they also need to figure out their retirement and health plans, and they are not covered with paid sick and vacation leaves offered in traditional work (Mukhopadhyay and Chatwin 2020). Their existence also negatively affects traditional taxis because price competition for customers will tend towards cheaper services (Jalloh 2019).

In Mexico City, these app-based transportation services faced complaints from ordinary taxi operators. They are not registered as public utility vehicles, set their fares, and do not pay taxes. Hence, they can provide cheaper services. A special agreement was formulated through a participatory consultation with different stakeholders. Included in this are they must register with La Secretaría de Movilidad de la Ciudad de Mexico (SEMOVI), the vehicle should cost MXN 200,000 and registered with SEMOVI, TNC must pay 15% tax per ride, and drivers are not allowed to use cash payments to stabilize the market share between taxis and ride-hailing apps. In December 2018, the new mayor of Mexico City wanted to modernize licensed taxis by replacing traditional meters with tablets. Instead of restricting app-based companies, he

resolved to help licensed taxis be more competent by providing them technological tools (Eisenmeier 2018).

In India, ride-hailing drivers that were interviewed came from a variety of job sectors. Often, they previously work as a driver of private parties, some are drivers of tractors in rural areas, while others have their own business, informal workers, or coming from marginalized groups or religious minorities. These drivers' final take-home varies from $203 to $676 per month due to various factors including choices of fuel and cost of the car. Most drivers work for 14 hours a day to maximize net income. They do not view their job as temporary but full-time. Since they own their cars, they treat themselves as independent and spend on maintenance, fuel, and other expenses. They are also able to balance income and expenses on their own. The government assisted these drivers by providing 60% subsidies for the on-road car price, and Uber also gave driving and communications skills training. Additionally, driver-cum-owner scheme was launched for drivers to loan and eventually own the vehicle, which is more inclusive of lower caste and class (Prabhat et al. 2019).

Despite work flexibility, drivers' net income is reduced with the other costs such as maintenance and internet and struggles with an increase in competition. Consequently, they resolve to follow the surge of demand, requiring them to work even on weekends, bad weather, and night-time to get higher income or meet the goal of wage per day. Not many drivers complain about the lack of social security since they could not see its immediate impact on them. In terms of safety, drivers feel safer since the app stores data from the riders, and they are not paid by cash. Criminals may, however, try to make fake accounts to steal their cars. Digitalization in transportation services mainly benefits foreign platform companies, investors, car manufacturers, car selling agencies, insurance companies, and telecommunication companies but poses risks to the sustainability of local app-based companies and traditional transportation companies (Eisenmeier 2018).

According to Li et al. (2020), other than online transportation, there is also a rise in food delivery (FD), which provided jobs for riders, cooks, restaurants, and app developers. However, delivery people have low job satisfaction due to standardized work, heavy workload, limited training, and safety risks. Traditional restaurant industries decreased in dining and food traffic due to decreasing promotions and subsidies and higher commission than when they started joining the app. Small restaurants may face problems since they do not have much bargaining power. It is also difficult to transfer to other online FD platforms since it is usually monopolized. Refunds are shouldered by the restaurants as well, even if the error is not on their end. On a positive note, hiring costs and renting costs decrease since they do not need much labor and space for dine-ins. Regulators attempt to manage the ghost kitchens created due to the rise of online food delivery system. One of these was in 2017 when China Food Drug Administrative (CFDA) mandated that all online food stores must obtain business licenses and have a physical storefront.

There are debates concerning how online FD affects family and community interactions. As this helps reduce the time for groceries and cooking, people can have more time to chat while not stressing about food preparation. However, some research shows that consumers, especially

young adults, order online and choose to eat alone and avoid socializing. Also, online FD promotes a sedentary lifestyle, higher exposure to unhealthy foods, and physical inactivity, as they are always available even late nights and with a variety of meals to choose from, there is no need to cook or even walk to the stores. It also has a negative impact on traffic systems since delivery people earn based on the number of deliveries. It also has negative effect on the environment since it creates more plastic wastage and food waste (Li et al. 2020).

During this period of the COVID-19 pandemic, these drivers and couriers have sustained people during quarantine. They are at risk of a sudden turn of events and crisis since they are independent contractors, have an unstable job, and do not have social security. Although some parts of the world such as South Africa and Kenya provided financial support and grants, it does not include informal workers such as ride-hailing drivers. Uber has provided financial assistance but with the condition that the applicant should be confirmed with COVID-19 or has been mandated to self-quarantine by a doctor or public official. However, there are just 3.45 and 27 tests per 1000 people for Kenya and South Africa, respectively. In the United Kingdom, app drivers and couriers have been given more voice by recognizing them as a registered trade union after long struggles. This example could be a hope for the same groups struggling in the other parts of the globe to form unions for social movements and wider political responses (Otieno et al. Forthcoming).

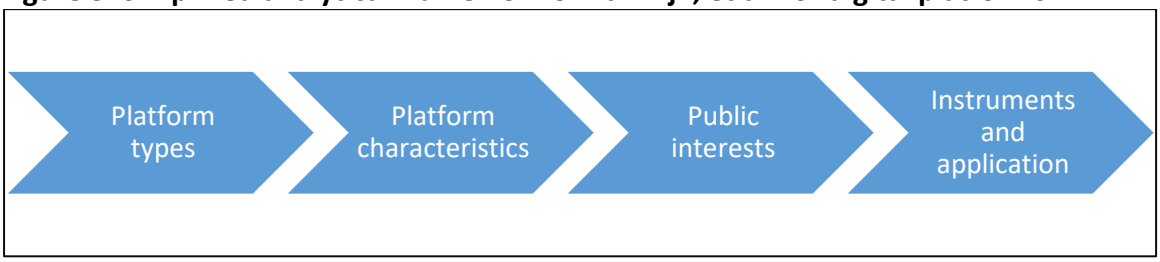
4. Enhancing government responses

The emergence of various digital platforms and the technologies that drive them will continue to shape our economy and society in ways that we cannot yet fully anticipate. Their impacts, whether beneficial or detrimental, will largely depend on government responses and the quality of regulatory governance. Maximizing the benefits and minimizing the costs of digital platforms should be the goal of economic policies and regulations (UNCTAD 2018). This final chapter discusses how the government could approach policy challenges and regulatory issues as they unfold and rethink its own role in the platform economy.

4.1 *An approach to policy and regulation*

Van Eijk, et al. (2015) develop a framework that promotes completeness and consistency for analyzing appropriate policies and regulations for digital platforms. Central to their approach is the importance of understanding the characteristics of each digital platform. Given the different types of digital platforms, they argue that analyzing them as a group will not be useful. Rather, it is the business model of the integrated firm that should be considered in the analysis of public interests and the appropriate policy interventions. Where a public interest is identified, the intervention of governments in markets can be justified. Government intervention is not limited to addressing the negative impacts however, as it is recognized that digital platforms may also have positive effects on issues of public interest. See Figure 5.

Figure 5. Simplified analytical framework of Van Eijk, et al. for digital platforms



Source: Van Eijk et al (2015)

As Van Eijk, et al. (2015) explained, the framework starts with identifying the type of platform and a detailed analysis of the characteristics of a specific platform, particularly in the way the platform exploits network effects. A tailor-made approach is needed since there is a large variety of digital platforms, and thus the potential impact on public interests differs. The next step is to identify the public interests involved, which refers to the interest of a country or community as a whole. For example, these include the promotion of competition, innovation, consumer protection, and ensuring safe and reliable digital communications. For a developing country such as the Philippines, the protection of workers and taxation issues are also important public interests. The final step is to identify the appropriate government intervention, which could be justified due to the presence of a market failure or the pursuit of other public interests, such as protecting fundamental rights and freedoms or the protection of minors. However, even if a market failure is identified, any intervention should still be assessed against the costs and benefits of doing nothing. Such trade-offs are especially relevant for a country with weak regulatory environments, where there is a risk of government failure. Available options need to be considered and may include a review of the following (Van Eijk et al., 2015):

- Generic and sector-specific regulations that are already in place;
- The implementation or enforcement of existing regulations;
- Adopting dynamic approaches to regulating digital platforms vs. static approaches used in traditional industries;
- A risk/harm approach so as not to stifle innovation. Thus, ex-ante regulation could be used for cases that suggest a higher risk of harm, while ex-post regulation would be applied for cases with a lower risk of harm; and
- The appropriate level of government where regulation is introduced.

Given that digital platforms are constantly evolving, a systematic framework for policy and regulatory analysis will be useful in responding to the risks and opportunities as they emerge.

4.2 *Role of government*

Diokno-Sicat (2018, p. 11) explains that government intervention can be justified on several grounds, such as to address a market failure; promote equity or income redistribution; and delineate and enforce property rights and contracts and define merit goods. Government

intervention could take the form of public production, government supporting and/or regulating private production, or through public-private partnerships. For example, the government could produce the good or service itself and distribute these to its citizens for free or below cost. Alternatively, government may allow private industry to supply while it retains regulatory powers. Finally, government may also enter into joint ventures with private entities or engage in other forms of partnerships.

Government as producer

As presented in the previous chapter, the government has created a few online platforms to match MSMEs and farmers with consumers and there are calls for the DTI to establish more.[2] A review of the existing government created platforms will be useful in determining the sustainability of these initiatives. As discussed, there are upfront investments or fixed costs involved in establishing a digital platform and the benefits (or economies) from both the demand side and supply side can only achieved when the user base from the different sides of the platform reach a certain size (hence, the so-called race to scale). Attracting users however will also depend on the services offered in the platform which the government may not be able provide or deliver efficiently due to the various constraints as a public enterprise. Hiring, retaining, or accessing highly skilled talent and various digital technologies will also be challenging. Thus, there may be other ways for the government to encourage the creation and growth of digital platforms designed for a specific purpose or group, without necessarily operating one. Finding the right form of public-private partnerships is also important lest the government unwittingly enter into exclusive arrangements with specific companies and their affiliates, which may have anti-competitive effects (Serafica, Rosete, Camaro, & Salvanera, 2020).

Government as enabler

The government can support the growth of the platform economy by creating an enabling environment. The Innovative Start-up Act (RA 11337) and the Innovation Act (RA 11293) should be utilized to support digital start-ups and the introduction of innovative products that address market needs. Identifying the appropriate incentive along a start-up's life cycle is critical. In terms of the legal framework for digital platforms, Serzo (2020) argues that while the baseline laws and regulations are in place for electronic and cross-border transactions, there are weaknesses in the country's regulatory framework that discourage the introduction of innovative business models and services as well as limit the growth of digital platforms. Barriers to expansion include investment restrictions and unpredictability in the implementation of regulations which contribute to the uncertainty of the legal environment (Serzo, 2020).

[2] For example, Senator Aquilino Pimentel III has called on the DTI to establish an online shopping platform for Philippine made products (http://legacy.senate.gov.ph/press_release/2020/0930_pimentel1.asp) while Rep. Lucy Torres-Gomez has filed House Bill No. 8064, or the Online Pinoy Creative Act, which seeks to create an online platform for Filipino creative arts, products, and services (https://www.pna.gov.ph/articles/1123574).

Investment in digital infrastructure is necessary, although not sufficient, to enable greater participation in platform-enabled activities (Quimba, Rosellon, & Calizo, 2020) as well as support a tax system suited for the digital economy (Cuenca forthcoming; Serafica, Quimba, & Cuenca, 2020). Nurturing digital skills and talent should also be a focus. Bayudan-Dacucuy, et al. (2020a, 2020b) highlight the need to maximize the earning potential of online workers through skill formation and investment in human capital development to enable them to participate in higher value-added activities. Addressing the skills deficit is also vital to addressing the digital divide (Quimba, Rosellon, & Calizo 2020). In terms of national statistics, Albert (2020) calls for new data and indicators to be developed in order to better meaure the platform economy and guide policy formulation. Making platform or online work more visible (for example, by capturing various work arrangements in labor force surveys) will help in designing and targeting government support (Bayudan-Dacuycuy, et al. 2020a).

Government as regulator

The role of the government as regulator is crucial. To cope with the various issues related to digital transformation and the data economy, a shift towards collaborative regulation or 5th generation regulation (G5) is recommended (ITU, 2020; ITU and WB, 2020). There needs to be close collaboration between the ICT regulator and the other regulators such as those dealing with competition, consumer protection, data protection, finance, energy, transportation, commerce/trade and other issues. This is in recognition of the fact that some form of digital regulation now occurs across different agencies. Consequently, the overall regulatory toolbox will need to expand to include policies and regulations on competition, data protection, cybersecurity, e-Commerce/e-Transactions, digital financial services, accessibility, taxation of Internet services, and infrastructure mapping. Furthermore, collaborative regulation for the digital era must be principle-based. Specifically, regulations need to be forward-looking, holistic, SDG or development-oriented, evidence-based, market-proof (i.e., provides regulatory space for digital experimentation such as sandboxes, pilots, and the new focus of regulation-AI, IoT, fintech), incentive-based, innovation-based, inclusive, and technology neutral.

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