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Digital Platforms and Global Value Chains

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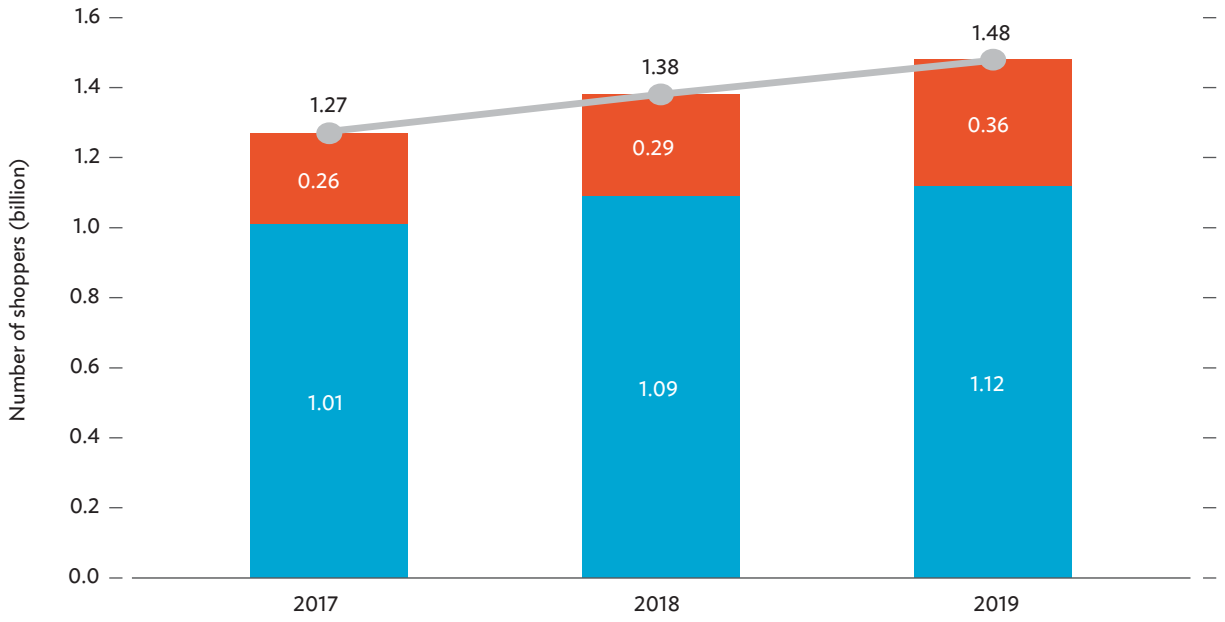
The two largest changes that have affected international trade since the 1990s are the creation of the new digital economy and the development of global value chains (GVCs). Both are inherently connected to new information and communication technology (ICT), and both have seemingly increased trade inclusivity, benefitting the trade participation of micro, small, and medium-sized enterprises (MSMEs) and developing countries. The interaction between the digital economy and GVCs is not well explored, however. Although the growth of both may have been in parallel, is there evidence that the digital platforms at the core of the digital economy affect GVC participation? This chapter examines the role of digital platforms, especially e-commerce marketplaces in the modern economy; the ways these platforms can increase economic inclusivity; and the development of GVCs and their effect on trade participation. The chapter also reviews the evidence on the link between digital platforms and GVC participation.

The new digital economy is based around platforms—search systems such as Google, marketplaces such as Alibaba, and application platforms such as Android, among many others (ADB 2021; Evans 2011; Kenney and Zysman 2016; OECD 2019). These platforms have applications for all types of businesses, opening doors to new industries and players from micro firms to any digitally connected business in the world. Digital platforms not only bring supply- and demand-side players together to transact but also the platforms themselves are part of the ecosystem and they have become integral to value-creation processes, such as collecting data (Busch 2020; OECD 2019).

The COVID-19 pandemic has strengthened the digital economy and the role of digital platforms as the global economy became increasingly virtual because of physical distancing measures (ADB 2021; OECD 2021). For instance, the share of online retail sales increased markedly in 2019 and 2020 and now account for nearly a quarter of retail sales in the People's Republic of China (PRC), the Republic of Korea, and the United Kingdom (UNCTAD 2021). The value of online shopping, all of which is facilitated and conducted on some level by digital platforms, has also grown steadily in recent years, and is estimated at $26.7 trillion in 2019 or some 30% of global gross domestic product (UNCTAD 2021). More than 1.4 billion people made online purchases in 2019, a number that is sure to rise given the increase in online retail sales due to the COVID-19 pandemic (Figure 6.1).

Figure 6.1: Global Online Shoppers, 2017–2019



Source: United Nations Conference on Trade and Development. 2021. Estimates of Global E-Commerce 2019 and Preliminary Assessment of COVID-19 Impact on Online Retail 2020. *UNCTAD Technical Notes on ICT for Development*. No 18. Geneva.

The growing trend in e-commerce sales is global, but participation has not been equal and is concentrated in Asia, Europe, and North America (UNCTAD 2021). Indeed, the top 10 countries with e-commerce sales, comprising four-fifths of global e-commerce in 2019, were from these regions. Some of the reasons for this geographic concentration is due to digital infrastructure, since these regions are characterized by extensive mobile network coverage and internet access (ITU 2020), as well as digital skills being more prevalent in these regions (ADB 2021). The installation of global telecommunication equipment continues to grow but it, too, is not distributed equally around the world. Even so, the digital economy has created business opportunities through new digital services and methods of sale (OECD 2014). MSMEs have been able to capture some of the growth in e-commerce both domestically and internationally, particularly in

specialized manufacturing and services, which are areas of competitive advantage for smaller firms (Cusolito, Safadi, and Taglioni 2016). The internet also makes it easier to find and target niche demand opportunities, and has created the phenomenon of "born global" firms, with small enterprises able to export their products from initiation (Wong and Merrilees 2012). Phone applications are a good example of this. In 2009, the game Angry Birds and the messaging service WhatsApp were both created by small groups of developers. Both were immediately available for download to mobile phones around the world, making these small digital services firms instantly international. This aspect of global digital inclusion for businesses of any size is important from a development perspective since MSMEs make up more than 90% of firms in the world and account for more than 60% of global employment (WTO 2016).

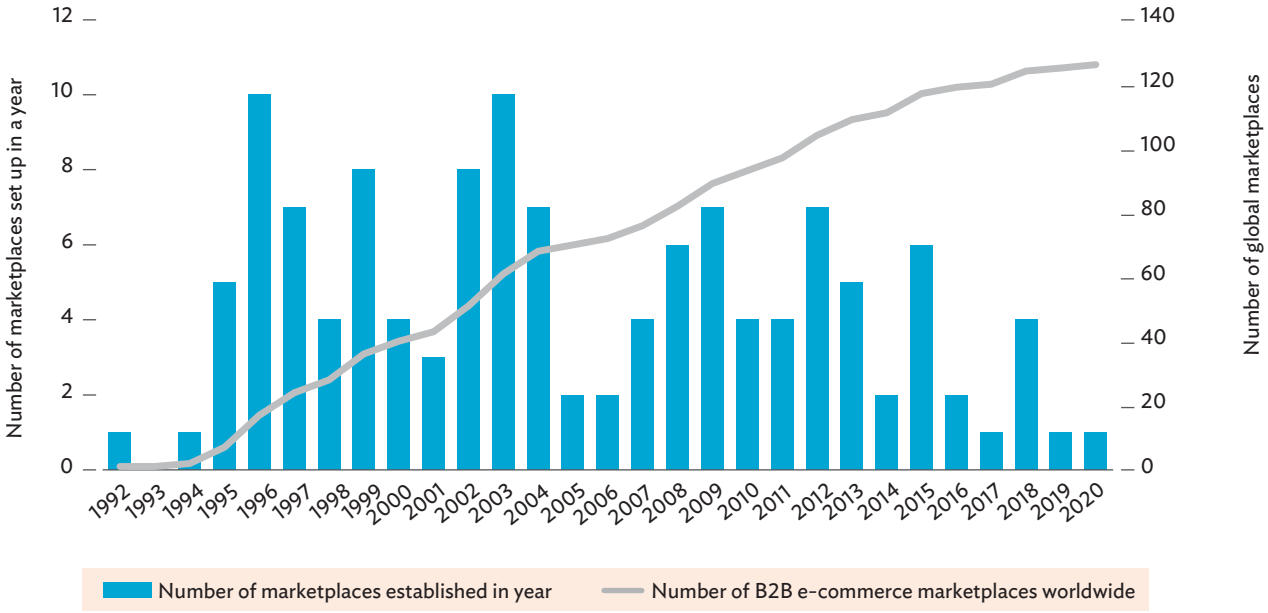
Digital Platforms

Platforms, digital or analogue, make it possible for two or more groups to interact directly with each other, and they tend to develop when there is both a benefit in connecting and connecting is easier through an intermediary (Evans 2011). Platforms also create "network effects," meaning the more users a platform has the more valuable those users find the platform (Evans 2016). Bazaars and marketplaces, where merchants and customers came to a specified place to interact, are the most obvious examples of analogue platforms from the past. Similarly, digital platforms are businesses aiming to provide digital space and tools for different parties to transact—and not just for buying goods but also for services or even just for social interaction. Examples of digital platforms range from e-payment services, such as PayPal Holdings Inc., that connect purchasers' credit information to vendors selling products or services; ride-sharing applications, such as Uber Technologies Inc. that connects drivers with riders; and social media services, such as Instagram, bringing individual content generators and advertisers together with viewers. Different digital platforms and users can also be linked to each other, creating a web of connected parts that is a digital ecosystem (OECD 2019). For example, Google and other search engines connect searchers and advertisers to transaction platforms, social networks, or whatever site is being searched; these sites then connect to their own buyers, sellers, or users creating a larger interaction beyond the search engines themselves.

The use and revenue of digital platforms have exploded in recent years. According to Cusumano (2020), the "most valuable publicly listed companies in the world today—Apple, Microsoft, Amazon, Alphabet-Google, Facebook, Tencent, and Alibaba—share a common trait. They are platform businesses—that is, they bring together different market actors in order to distribute or exchange products, services, or information." The trend is also transformational, bringing traditional retailers to the online marketplace. Walmart Inc. is now the second largest e-commerce retailer in the United States (US), with online sales up 79% for its fiscal year 2021 (ending 31 January 2021) compared with total company revenue growth of 6.7%. ADB (2021) estimates that revenue from global digital platforms in 2019 was $3.8 trillion, or 4.4% of global gross

domestic product. These figures are striking. Digital platforms have grown to a visible share of the global economy from essentially no presence before the 1990s. One example of the growth in digital platforms is the steady global increase of business-to-business (B2B) e-commerce marketplaces from the early 1990s (Figure 6.2).

Figure 6.2: Business-to-Business Marketplaces, 1992–2020

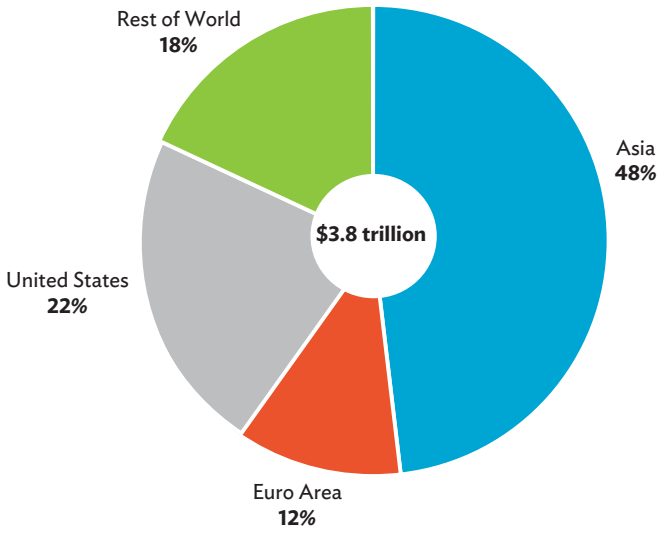


B2B = business-to-business.
Source: Maxime Ladrière, Kathryn Lundquist, and Qing Yi. 2020. B2B E-Commerce Marketplaces and Micro, Small, and Medium Enterprises: Evidence of Global Value Chain Facilitation? Unpublished. World Trade Organization; authors' calculations based on similarweb.com and web research.

Researchers have tried to apply various types of categories to distinguish types of digital platforms, such as by a platform's function, users, or type of data collected (OECD 2019). Examples of the first type, by function, are the often used "transactional" versus "innovation" platforms, such as Amazon Marketplace and Airbnb that connect users and transmit data, as opposed to Linux and Microsoft that allow users to develop products or services on their operating systems, which are sold to consumers. Although these examples appear to be distinct categories, some platforms, including Apple and Google, facilitate both transactional and innovation operations simultaneously by connecting buyers and sellers and creating an environment to develop content. Other methods, such as categorizing by user or type of data collected, face similar difficulties. To overcome the problem of platforms straddling categorization definitions, the Organisation for Economic Co-operation and Development broadly defines an online platform as a "digital service that facilitates interactions between two or more distinct but interdependent sets of users (whether firms or individuals) who interact through the service via the internet" (OECD 2019). This is how digital platforms are viewed in this chapter.

As with e-commerce generally, digital platforms are not distributed or used equally throughout the world. Asia is at the forefront of the digital platform economy, which generated $1.8 trillion in 2019, nearly half of the $3.8 trillion in global revenue from these businesses (ADB 2021) (Figure 6.3). A survey of the headquarter locations of B2B e-commerce marketplaces by Ladrière, Lundquist, and Yi (2020) similarly found that most of these specific platforms are in Asia, followed by North America and Europe.

Figure 6.3: Digital Platform Revenue by Region, 2019



Source: Asian Development Bank. *Asian Economic Integration Report 2020/2021: Making Digital Platforms Work for Asia and the Pacific.* Manila.

Digital Platforms and Micro, Small, and Medium-Sized Enterprises

Digital platforms provide many benefits and additional capabilities for their users, which can be especially beneficial for smaller businesses. Digital platforms through their services, such as market research, e-payment, and online advertising, can lower barriers to enter markets, making economic participation more inclusive (OECD 2021). Digital platform firms may even provide these services free or at a loss so they can increase participation and their network effect. This allows MSMEs to access services that might otherwise have been prohibitively expensive and can help them overcome skills gaps. Table 6.1 shows some MSME business functions performed through online digital platforms.

Table 6.1: Business Functions Performed for Micro, Small, and Medium-Sized Enterprises through Online Platforms

SME Business Functions	Matchmaking		Main Benefits for SMEs	Examples
	SME End-User	Other End Users		
Marketing, advertising, branding, customer services, external communication	All SMEs	Potential clients, business partners	Positive indirect network effects, access to markets (incl. global), advanced analytics/ AI (e.g., for targeting/market segmentation, impact analysis)	Facebook, Google, YouTube
E-commerce (online marketplaces)	SMEs (e.g., manufacturing, retail)	Companies (B2B), individual customers (B2C)	Positive indirect network effects, access to markets (incl. global), advanced analytics/ AI (e.g., for targeting/market segmentation, impact analysis), lower transaction costs (e.g., payment, shipping, logistics), enhanced client trust (i.e., reviews system, platform insurance)	Amazon, E-bay
Service delivery (aggregators of incumbents[a])	SMEs in food services, media and entertainment, accommodation, among other areas	Individual customers	Positive direct and indirect network effects, access to global markets, lower transaction costs (e.g., payment, shipping, logistics, customer care), enhanced client trust (i.e., review systems, platform insurance)	Booking, Deliveroo, DoorDash, Netflix, Sony PlayStation, Spotify, Uber Eats
Service delivery (disruptors for new entrants into the market[a])	Self-employed, entrepreneurs	Individual customers	Positive indirect network effects, standardization of offer, standardization of contracts, reduced asymmetry of information, access to markets (incl. global), enhanced client trust (i.e., review systems, platform insurance)	Airbnb, TaskRabbit
Financing	SMEs looking for financing sources and financial products	Financial institutions, banks, retail investors	Positive direct network effects, access to global markets, reduced financing costs, reduced asymmetry of information (e.g., collaterals)	Campeon, Funding Circle, GoFundMe, Kickstarter, Lending Club, Revolut,
Payment	Selling SMEs (merchants)	Individual customers	Positive direct and indirect network effects, lower cashing delays, reduced asymmetry of information (funders)	PayPal, Square, we.trade
Communication, remote working, teleconferencing	All SMEs	Individual customers, suppliers, workers	Positive direct and indirect network effects, lower-to-zero costs for implementation (incentives or benefits)	Google Meet, Microsoft Teams, WhatsApp, Zoom
Research and development, design, exploration	SMEs (application developers)	Other programmers, individual users	Positive direct network effects, lower production and diffusion costs (e.g., common standards, open-source code)	App Store, GitHub, Google Play

AI = artificial intelligence, B2B = business to business, B2C = business to customer, SMEs = small and medium-sized enterprises.

Note: The SME end-user column is used to highlight the different types of SMEs using different online platforms. It is by no means exclusive since large firms, nonprofits, and so on can (and generally do) use the same platform.

[a] The distinction between aggregators and disruptors is a qualitative assessment of the business model of platforms proposed in Alberto Bailin Rivares, Peter Gal, Valentine Millot, and Stéphane Sorbe. 2019. Like It or Not? The Impact of Online Platforms on the Productivity of Incumbent Service Providers. *OECD Economics Department Working Papers.* No. 1548. Paris: Organisation for Economic Co-operation and Development. The paper distinguishes between online platforms focused on allowing incumbent services providers to reach their customers more effectively (aggregators such as Booking and Deliveroo) and online platforms opening markets to previously almost nonexistent competitors, usually self-entrepreneurs (disruptors such as Airbnb and Uber).

Source: Organisation for Economic Co-operation and Development. 2021. *The Digital Transformation of SMEs.* OECD Studies on SMEs and Entrepreneurship. Paris.

Digital platforms can provide valuable network effects for MSMEs that help them increase their access to more consumers and provide more sourcing options. These platforms are also one of the primary ways for MSMEs to get into international markets since they can reduce trade barriers and lower costs (Morais and Ferreira 2020; OECD 2018). Evidence shows that digital platforms can increase productivity, with stronger effects seen in smaller firms (OECD 2021). These productivity gains occur by reducing information asymmetries through ratings and review systems and by increasing competition between service providers, which can lead to cheaper and better options available to firms (OECD 2021;

Rivares et al. 2019). E-commerce marketplaces, which connect buyers and sellers directly, are a particularly good example of these benefits, especially for MSMEs. E-commerce marketplaces, for instance, offer services such as credit card processing, storage facilities, and shipping that are especially helpful for smaller players (Wu and Gereffi 2019). Evidence shows that although smaller firms are less likely to have online sales, those that do sell online are more likely to use e-commerce marketplaces (Ladrière, Lundquist, and Yi 2020; OECD 2021) (Table 6.2).

Table 6.2: European Union Enterprises with Website or App Sales—Share of these Sales via E-Commerce Marketplaces (%)

Size (number of employed)	**2017**	**2018**	**2019**
Small enterprises (10–49)	40	42	41
Medium enterprises (50–249)	35	36	37
Average all enterprises	39	40	40

Note: For 28 countries in the European Union.
Source: Eurostat. https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do (accessed 20 May 2020).

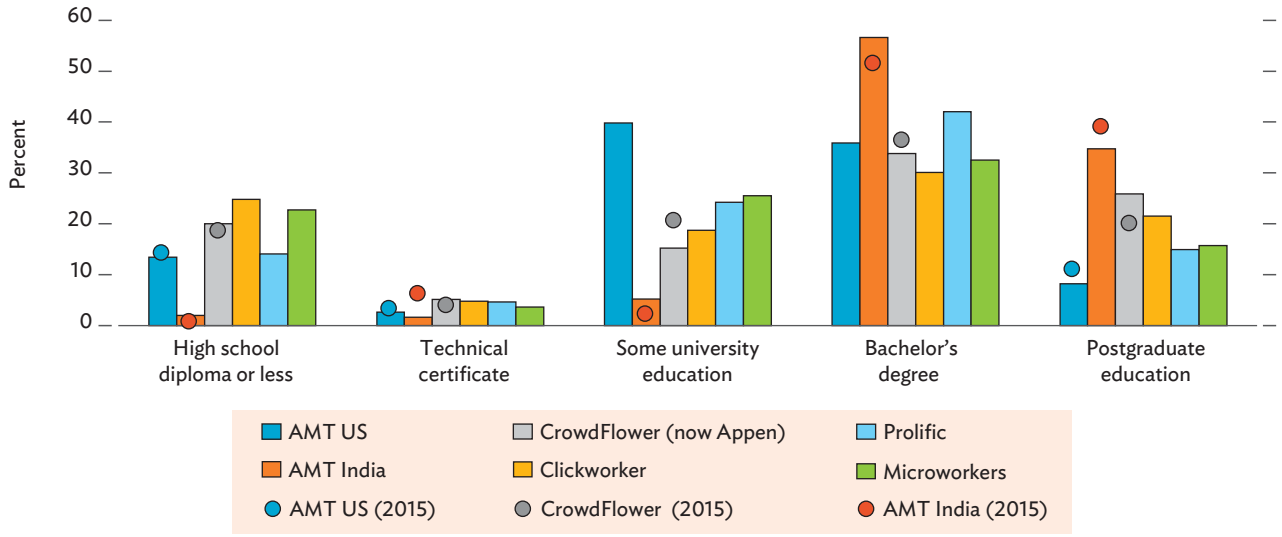
Many opportunities exist for MSMEs that can access digital platforms, including cost reductions to reach more and broader markets, which can promote economic development (Koskinen, Bonina, and Eaton 2019). Take the PRC's *Taobao* villages, defined by Alibaba Group Holding Ltd.'s research arm, AliResearch, as a village with more than CNY10 million in e-commerce sales annually or with at least 100 active online shops on Taobao, a PRC online shopping platform. These were essentially created by rural entrepreneurs and grew dramatically due to e-commerce. The success of these villages attracted more industries and businesses to them, increased average income, reduced the incentive to migrate, and improved the environment (ADB-ESCAP 2018).

Challenges of Digital Platforms

Digital platforms, despite their large number of benefits, can be challenging for MSMEs. Smaller firms can be constrained by a lack of training in new digital tools, which may prevent ICT from being used and so limiting their access to digital platforms (Martin and Vasilciuc 2011). Although digital platforms may provide complementary training modules, such as Amazon's e-book *The Beginner's Guide to Selling on Amazon*, firms may not be willing or able to devote time and resources for this (OECD 2021). Human capital constraints are also significant in the digital platform economy. For example, International Labour Organization surveys of crowdworkers in 2015 and 2017 find that more educated people are more likely to participate in digital contract work, such as the jobs posted on Amazon Mechanical Turk, Appen, and Clickworker (ILO 2018) (Figure 6.4). Digital platforms may also use algorithms that unfairly promote their own products or obscure smaller sellers (Khan 2017; OECD 2021). Even more fundamentally, digital platforms require a minimum level of internet connectivity and digital

infrastructure that no amount of technology leap-frogging can overcome. And as discussed later, the tendency for digital-platform consolidation can adversely affect smaller players with limited market power.

Figure 6.4: Educational Level of Crowdworkers by Platform



AMT = Amazon Mechanical Turk.
Source: International Labour Organization. 2018. *Digital Labor Platforms and the Future of Work*. Geneva.

An important challenge for digital platforms is their tendency for market consolidation, determined by the relative level of switching costs between digital platforms (Busch 2020). This is because the aggregation of users can be self-reinforcing, with network effects increasing as a platform gets new users that in turn encourages even more new users to join that platform, which weakens potential competition. This has implications for the productivity gains offered by digital platforms, which were found to be lower when a single platform is dominant in a given market (Rivares et al. 2019). E-commerce marketplaces are an example of digital-platform consolidation. Amazon Inc., among the most valuable publicly listed companies in the e-commerce marketplace, accounted for nearly 20% of the gross merchandise value of the top 13 business-to-consumer (B2C) e-commerce companies in 2019, and Alibaba Group Holding Ltd., JD.com Inc., and Pinduoduo Inc. accounted for more than 60% of the value of global B2C gross merchandise and 80% of the PRC's retail e-commerce (Ma 2021; UNCTAD 2021). These dominant market shares mean firms looking to sell on digital platforms are almost obliged to consider these e-commerce marketplaces—at the very least for the inherent network effects of these marketplaces, because if firms were to post their products elsewhere there would be far fewer potential "eyeballs" for their offerings.

Evans and Schmalensee (2007) find there are five factors that can either lead to, or discourage, the consolidation of digital platforms: network effects, scale economies,

congestion, platform differentiation, and multi-homing (where customers use more than one digital platform for similar purposes because they offer different features). The first two, network effects and scale economies, lead to more consolidation.[1] The last three, congestion, platform differentiation, and multi-homing, can reduce this type of consolidation (Evans 2011).

Digital platforms also have many direct and indirect costs for their use, including costs to join a platform and data-sharing requirements by platform users (OECD 2021). E-commerce marketplaces, for example, can be gatekeepers, especially to MSME participation, either through expensive membership fees, strict return and shipping policies, and rating systems that favor large companies.

Although digital platforms have many inherent benefits and can increase economic inclusivity, the potential, and even tendency, toward market consolidation is an important concern. Policymakers need to consider this, along with requirements for digital access and skills, and the potential direct and indirect costs of using a digital platform.

Global Value Chains

The phenomenal growth in GVC trade since the 1990s has been driven by falling trade barriers and lower transport costs. This rise is closely tied to ICT, which allows production to be partitioned while keeping communication among dispersed production segments intact (Rodrik 2018). The rise in GVC trade has promoted greater economic inclusion, resulting in Richard Baldwin's often-cited "Great Convergence" as the Group of Seven's share of world income began to decline in the 1990s and the manufacturing share of key industrializing economies increased (Baldwin 2016).

During this period, GVC participation also grew steadily, declining only during the global financial crisis of 2008–2009 (Figure 1.1). More recently, the GVC participation rate, as measured by the share of GVC exports to total exports, has levelled off and even begun to decline. This has been attributed to the slowdown in trade liberalization and a parallel decline in the rate of fragmentation of traditional GVC industries, such as machinery, electronics, and transportation, as they reached a new equilibrium with industrializing economies sourcing more domestically rather than cross-border (World Bank 2020).

Geographic differences in value-chain participation are present in regional versus global participation. Since 2000, North America has had the highest ratio of regional to global value-chain participation rates, although this has weakened slightly (Figure 6.5).

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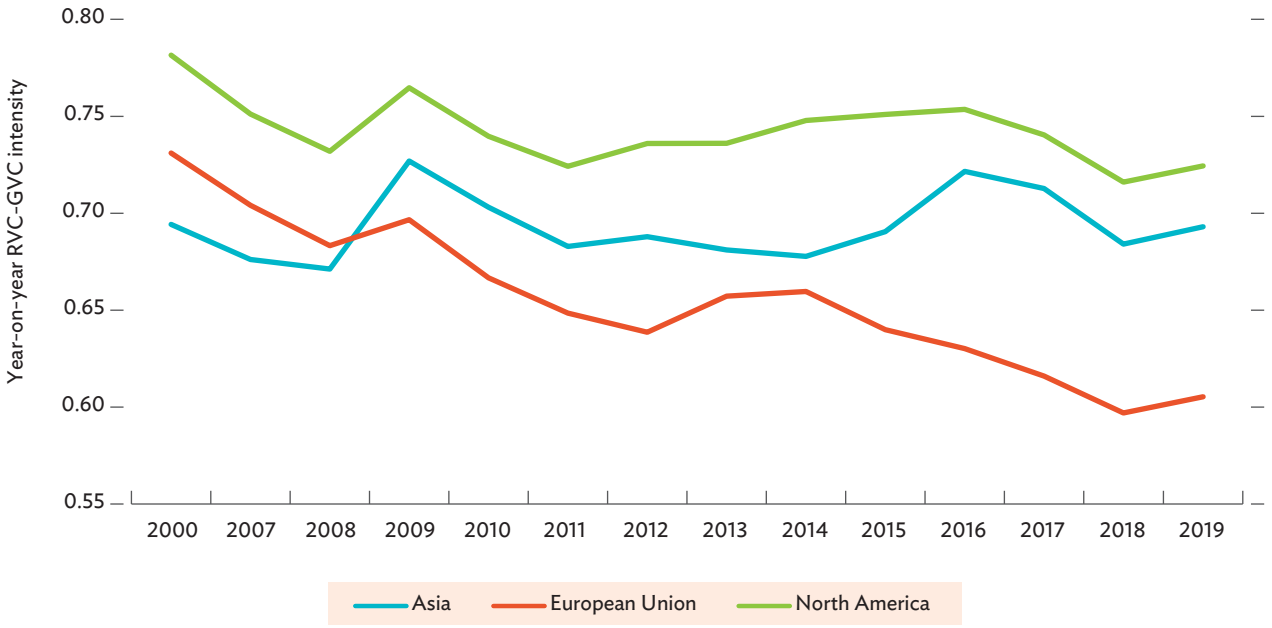
1 Here, digital platform users benefit from a larger pool of other users on the same platform, such as e-commerce marketplaces, or the digital platform itself has high fixed operating costs.

The European Union's regional value-chain intensity has declined considerably since 2000 as countries in the bloc sourced more globally. This can be seen in the sharp downward trend in the ratio of regional to global value chain participation rates. Asia's regional value-chain intensity has increased substantially since 2000 (ADB 2021).

Figure 6.5: Ratio of Regional and Global Value Chain Participation Rates in Asia, European Union, and North America, 2000–2019



EU = European Union, GVC = global value chain, RVC = regional value chain.
Note: RVC–GVC intensity is the ratio of RVC and GVC participation rates. North America comprises Canada, Mexico, and the United States.
Source: Figure 2.11 in Asian Development Bank. 2021. *Asian Economic Integration Report 2020/2021: Making Digital Platforms Work for Asia and the Pacific.* Manila.

Countries within regions also have different GVC participation levels and may be more prevalent at certain positions along GVCs. For example, Indonesia, Mexico, Poland, the PRC, the Republic of Korea, and Turkey participate in downstream manufacturing. Australia and Brazil are among countries that provide upstream commodities. And India is still focused on the services sector (Kang, Bacate, and Ramizo 2020; World Bank 2020). Overall, three GVC hubs have emerged—Germany, the PRC, and the US—one in each of the three main regions examined (Ferrantino and Taglioni 2014).

Global Value Chains and Micro, Small, and Medium-Sized Enterprises

Although a large part of the GVC story can be told in terms of multinational corporations, these chains have created new opportunities for MSME suppliers. One of the ways that GVCs have been able to bring in players from developing countries is by fragmenting

the production process into different, self-contained parts that require different skills and abilities. This fragmentation, or modularization, which has only been possible with advances in communication technology, allows for entrants with capacities in only part of the production of a finished product to join a value chain (Fort 2017). This can also help MSMEs whose businesses focus on only one specialized input of a larger product.

GVCs use services much more than other forms of international trade. Although an estimated one-fifth of gross exports globally are services, nearly half (46%) of value-added inputs within exports come from services (UNCTAD 2013). This has important implications for increasing the participation of MSMEs in GVCs since exporting MSMEs are more prevalent in services sectors (Cusolito, Safadi, and Taglioni 2016).

Although GVCs have many potential benefits, including increasing the competitiveness and innovation of participating firms, they have asymmetries that can work against MSMEs (Das and Hussain 2017). To begin with, the number of lead firms is limited and they are mostly in developed countries. This can mean that opportunities for suppliers are very competitive and lead firms make the terms, leaving smaller suppliers with the choice of either accepting these terms or not participating (Sturgeon 2009). The types of activities that lead firms outsource, especially to developing countries, often generate lower revenue than those performed in other regions, particularly for manufacturing, and the employment and profit associated with these activities can significantly differ (Gereffi and Frederick 2010). Suppliers, especially MSMEs or firms in developing countries, may be locked into lower-revenue industries either because of poor access to resources, including skills and infrastructure, or because of the governance structure of the value chain itself (Antràs 2020; Das and Hussain 2017). This is discussed in more detail later in the chapter. Because of the prominent role that multinational corporations play in promoting GVC networks through their market-seeking or efficiency-seeking foreign investments, the absorptive capacity of host countries in nurturing networks of local suppliers with foreign-invested enterprises becomes crucial.

Although MSMEs and participants from developing counties face hurdles for participating in GVCs, considerable GVC openness still exists. However, the extent of that openness depends on GVC governance structures (Kano, Tsang, and Yeung 2020). Gereffi, Humphrey, and Sturgeon (2005) categorize value-chain governance—that is, who participates in a chain and what their role is—into five main groups, which are important in the consideration of digital platforms. The first group are market value chains, or market linkages, where two parties interact with each other regularly, but without formal contracts. As a result, switching from one supplier to another is easily done. The second group includes modular value chains where buyers request custom inputs from a seller. It is, however, possible to make these inputs on standard machinery available to other providers and therefore suppliers have only limited market power. The third group includes relational value chains that are highly integrated. Here, two parties may be dependent on one another and the relationship can be long lasting. The fourth group contains captive value chains in which smaller suppliers depend

on larger buyers. They face significant hurdles or costs to switch, however. The fifth group is hierarchical, with vertically integrated GVCs and top-down management from headquarters to subsidiaries. Each of these five governance structures holds both opportunities and barriers for more inclusion. Modular value chains, for example, open opportunities for MSMEs to enter GVCs, but upgrading or differentiating a product can be challenging for these firms, and the value added from modular value chains can be low because of asymmetries and the bargaining power of lead firms (Antràs 2019).

Digital Platforms, International Trade, and Global Value Chains

Digital platforms are reshaping economies by enabling new international transactions and playing an increasing role in trade (OECD 2021). This can be seen in the increased number of small commercial packages crossing international borders (facilitated by digital platforms either directly as e-commerce marketplace transactions or via other online commerce) and services exports by contractors through labor platforms, such as Amazon Mechanical Turk or Clickworker, that enable anyone who is digitally connected around the world to perform requested virtual tasks (OECD 2020). The digital economy and digital platforms are making it easier for new entrants to trade via a substantial reduction in search and communication costs, and the development of e-payment systems allows for easier and more secure money transfers (ADB 2021). Digital platforms can also be exported, with Google and other familiar search engines available across borders or online store platforms, such as Shopify, available to businesses in many countries. Cross-border B2C e-commerce totaled an estimated $440 billion in 2019, up 9% from 2018 (UNCTAD 2021).

These cross-border trade effects can be realized by firms of all sizes, including MSMEs, and have implications for developing countries. Although MSMEs are still less likely to trade internationally, digital platforms can help them enter international markets (Jin and Hurd 2018). And MSMEs that use digital platforms, especially e-commerce marketplaces with their many built-in services, are more likely to export (ICC 2016; OECD 2021). The e-commerce marketplace companies themselves have also published research on ways their tools facilitate exports, especially for MSMEs. Amazon reported $3.1 billion in US export sales for 2019 specifically by MSMEs, up nearly 30% from 2018 (Amazon 2020). Digital platforms often start as small businesses and may continue as relatively small operations given the well-known “scale without mass” effect of digital businesses (Brynjolfsson et al. 2008).

The digital economy has undoubtedly expanded trade opportunities, but how has it affected GVCs? E-commerce is primarily conducted between businesses, executed sometimes through digital platforms, such as e-commerce marketplaces and direct purchases through business websites, or by other means, such as electronic data interchange and the digital platform technologies behind them. B2B e-commerce is estimated to make up about 90% of global e-commerce (Ferrantino and Koten 2019).

Unfortunately, statistics on cross-border e-commerce are scarce, especially for B2B transactions (UNCTAD 2016). But given the substantial share of B2B e-commerce, which is undoubtedly related to value-chain transactions, it can be surmised that at least some share of this is cross-border and therefore part of GVCs if broadly defined.

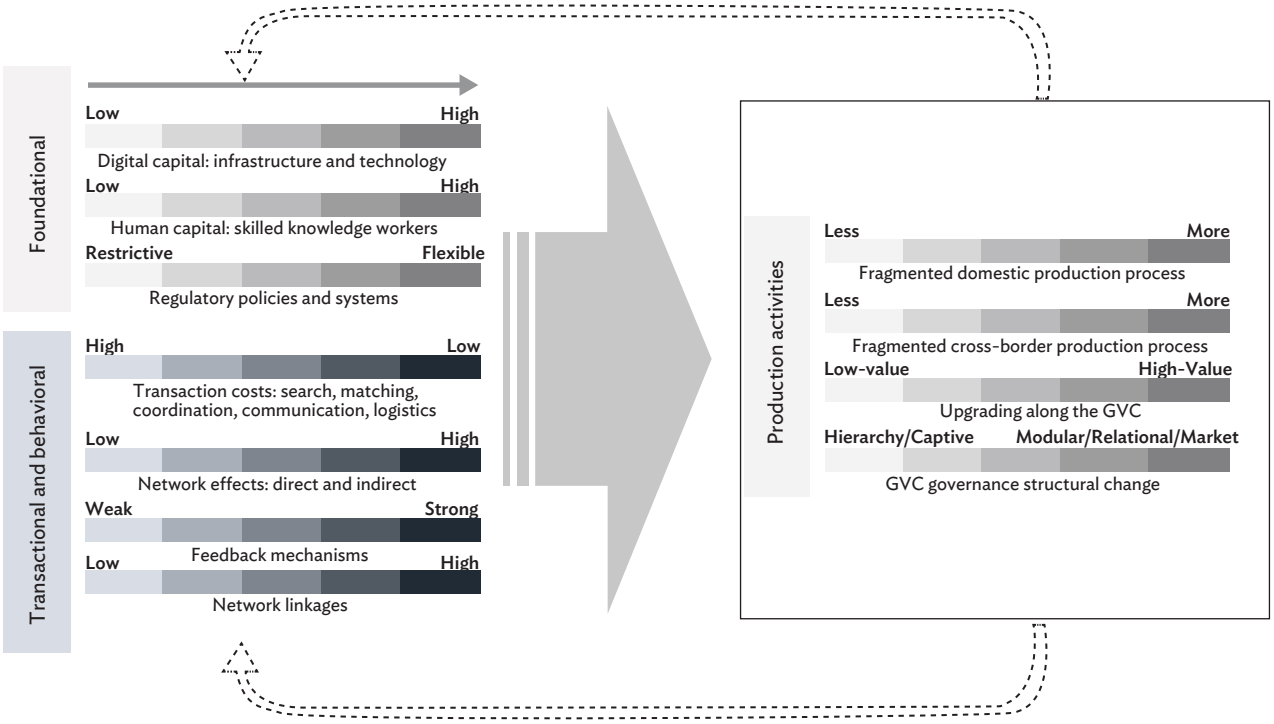
Despite the measurement challenges, research shows a link between trade facilitated by digital platforms, especially for e-commerce marketplaces, and GVCs. On a surface level, Ladrière, Lundquist, and Yi (2020) find that about one-third of e-commerce marketplace listings are intermediate inputs for downstream production, some share of which may cross borders as trade. Kang, Bacate, and Ramizo (2020), using Euromonitor International's dataset on B2C online commerce sales, find statistically significant effects for the impact of both internet and mobile internet retail sales on GVC exports within an economy. Similarly, Baldwin, Chiarotti, and Taglioni (forthcoming) link the entrance of an e-commerce marketplace in an economy with an increase in GVC trade. Some new value chains have also developed in tandem with these e-commerce transactions; these are "infomediary" value chains related to the data generated from a transaction conducted over a digital platform (Kang, Bacate, and Ramizo 2020). Data collected about a user, whether for accessing a website to view, say, a research paper or someone's shopping habits in an online store, allow firms to generate new value from the data either by selling it to other firms or using it for their own marketing.

Two readiness pillars need to be in place for digital platforms to enable firms, especially MSMEs, to participate in GVCs. The first pillar, foundational readiness, is the structural basis that needs to be present in an economy, such as physical infrastructure for internet access, human capital or know-how within the population, and national regulations that enable e-commerce transactions. The second pillar, transactional and behavioral readiness, focuses on the digital platforms themselves and whether they enable more market transactions by reducing search and coordination costs, leveraging and capitalizing on network effects, and using effective feedback mechanisms to enhance transactions (Kang, Bacate, and Ramizo 2020) (Figure 6.6). Once these two pillars are in place, GVC participation will be determined by level of fragmentation, with more fragmented value chains creating more opportunities for external parties, such as MSMEs and developing country participants. This last point on governance structure and the way digital platforms enable GVC participation has implications for the benefits of digital platform economies and innovation within GVCs.

Importantly, when it comes to e-commerce marketplaces and certain other types of GVC trade facilitated by digital platforms, the governance structure tends to be less hierarchical or captive, even less relational, and more modular or market-oriented (Ding and Hioki 2018). This has three main implications, especially for MSMEs and developing countries. First, the modular architecture of digital platforms themselves can contribute to innovation within firms and GVCs and help bring participants from developing countries into GVCs by allowing technologically constrained players to enter into a less demanding part of the value chain (Gawer 2014). Second, just as for MSMEs, an already

developed digital platform enables participants to skip investing their own resources to create something similar from the ground up (OECD 2021). And third, platforms can reduce coordination costs between different players—for example, by using standard software, such as Microsoft Office Suite that can be used for both communication and other business functions that are easily transferable.

Figure 6.6: Mechanisms through Which Digital Platform Economies Enable Firms to Engage in Global Value Chains



GVC = global value chain.
Source: J. W. Kang, M. L. Bacate, and D. Ramizo. 2020. *Digital Platforms and Global Value Chains.* Unpublished. Asian Development Bank.

For developing countries, these benefits are, however, contingent on a type of GVC governance that is platform-driven and on whether that governance requires direct integration and cooperation by firms within a GVC. Here, relational GVCs are characterized by close connections between firms and the intra-firm trade of intangible goods, such as production technology and business practices that can lead to upgrading by participating firms through learning and innovation (Gereffi, Humphrey, and Sturgeon 2005). Because these governance structures are primarily modular or market-based, some trade facilitated by digital platforms will fall into the broader definition of trade in intermediate inputs without the additional exchange of intangible value-added that accompanies relational GVC trade that can be so valuable for MSMEs and businesses in developing countries (Antràs 2020). Goods sold on e-commerce marketplaces are self-contained and interchangeable. At an even more basic level, many e-commerce marketplace transactions are one-off interactions with no expectation

of future purchases or commitments. In other words, if firms are only producing finished products, information exchange between industries is scant and the exchange of intangible value is decreased (Kang, Bacate, and Ramizo 2020). Unfortunately, buyer-driven GVCs, such as those facilitated by e-commerce marketplaces, do not necessarily want to share proprietary information with their developing country and MSME partners (Schmitz and Knorringa 2000; Bazan and Navas-Aleman 2004; Morrison, Pietrobelli, and Rabellotti 2008). High competition based on low costs and large volume for certain modular inputs could also limit mutual learning (Brandt and Thun 2011; Yasumoto and Shiu 2007). This contributed to the idea that digital platforms may actually be substituting for traditional GVCs on some level; for example, through their information-sharing capabilities and verification technologies that might make the contracted relationships of formal GVCs less necessary—and so contributing to the declining rate of GVC participation (van Alstyne, Parker, and Choudary 2016).

Digital technologies have also created a whole new GVC governance structure—internet-driven GVCs—that bring in the digital platform itself as an intermediary actor along with sellers or providers (supply side) and buyers or clients (demand side) (Gereffi 2001a and 2001b; ADB 2021). Internet-driven GVCs are diminishing the importance of physical stores and retailers, a trend that has been magnified by the COVID-19 pandemic. Internet-driven value chains have also added important new dimensions, including the two-sided market where customers can directly contribute their feedback to sellers or manufacturers, thereby influencing future product development and output (Evans 2011). This has significant implications for the labor-market space. Internet-based virtual intermediaries replacing physical intermediaries, such as brick and mortar stores, the displacement of clerks, and other face-to-face service providers, is accelerating—and entailing a remarkable shift within the spectrum of demand for services jobs. Internet-based virtual intermediaries have developed whole new value chains, such as the data-driven value chain for the generation, processing, and sale of data products (Curry et al. 2014).

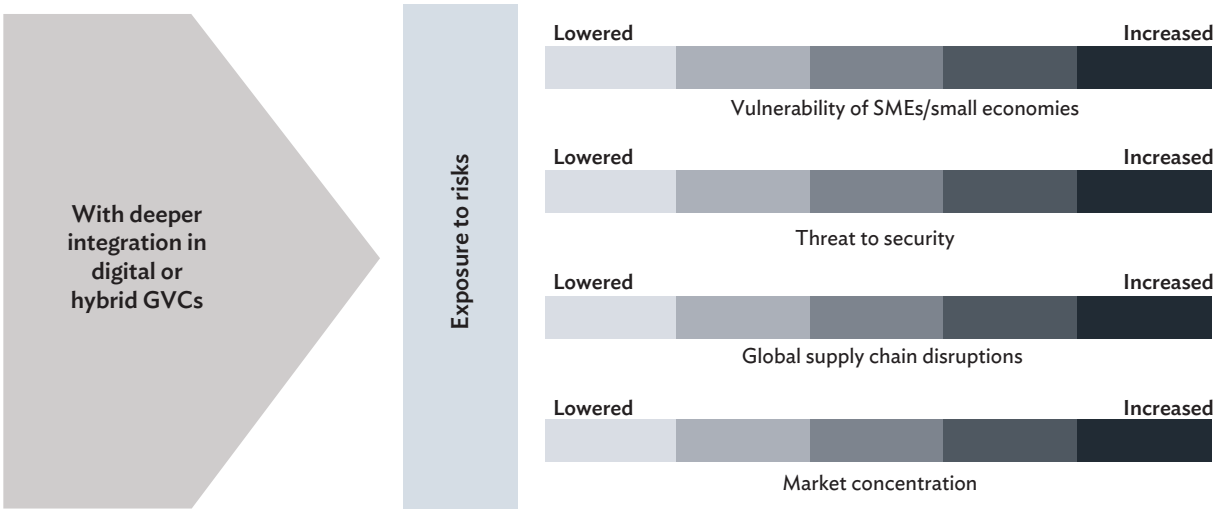
Challenges for Inclusion and Policymaker Considerations

Although digital or hybrid GVCs present many opportunities for inclusiveness, especially given their modular architecture, they also pose increased risks, as illustrated in Figure 6.7. These include increased threats posed by cyberattacks, a greater risk of global supply chain disruptions, and less market power when using monopolistic digital platforms because of consolidation (Kang, Bacate, and Ramizo 2020). “Winner-take-all” or “winner-take-most” scenarios for digital platforms also raise concerns for the inclusive participation in GVCs by MSMEs and firms in developing countries, although this is not a foregone conclusion (Evans 2011; OECD 2020).

For the digital economy more generally, policymakers face issues that need tackling to make access and use more inclusive. Besides access to digital infrastructure and improved connectivity, ADB (2021) highlights the need to lower barriers to entry and

promote interoperability across digital platforms to increase competition and reduce market consolidation. Policymakers need to consider the market power that arises from digital platforms, including the private data these platforms collect and the special case of integrated platforms, such as Amazon, that not only facilitate sales but also sell the firm's own products (ADB 2021; Faherty, Huang, and Land 2017). Government scrutiny is expected to become stronger because of the rapidly growing market shares of mega-platform firms and the potential anticompetitive influences from their gatekeeping advantage. Data access, privacy, and security are also important for data value chains. Ensuring that data are securely available for use and for the generators to have portable access to their own information is important for innovation and competition (Tucker 2019). Related to policymaker considerations for bringing digital platforms to an economy, an important finding in Kang, Bacate, and Ramizo (2020) is the need for secure servers and access to formal banking. Both of these variables have positive and significant effects on B2C online sales.

Figure 6.7: Risks Created from Digital Platforms



GVC = global value chain, SMEs = small and medium-sized enterprises.
Source: J. W. Kang, M. L. Bacate, and D. Ramizo. 2020. *Digital Platforms and Global Value Chains.* Unpublished. Asian Development Bank.

Because of the growing cross-border presence of commercial platforms, international tax cooperation is gaining considerable attention. The Inclusive Framework on Base Erosion and Profit Shifting, led by the Organisation for Economic Co-operation and Development, proposes the creation of a new right to taxation that is independent from physical presence (pillar 1) and a global minimum corporate tax (pillar 2). Both are expected to help resolve the controversy over fair taxation of digital services across borders. Although this initiative could lead to some reallocation in corporate income tax revenue among sovereign authorities, it may not act as a disincentive for digital platforms to curtail their global businesses.

Digital platforms can increase competition within markets and help lower prices by reducing search costs and enhancing efficiency gains in supply chain management and sourcing and outsourcing engagements. But these platforms can also pose anticompetitive challenges due to the advantages for incumbents stemming from economies of scale and scope, and due to their exclusive access to sources and information. Increasing the market power of digital platforms is likely to prompt growing attention in the sphere of competition policies (ADB-ESCAP 2018).

Increasing calls for regulatory vigilance notwithstanding, striking the right balance between anti-trade regulations and fostering scale economies driven by market innovation, and between regulations on data flows for privacy and security purposes and facilitating freer data transmissions for business efficiency, remains a challenge for policymakers.

Conclusions

Digital platforms and the new digital economy are inherently connected with GVCs. These new evolutions are also providing opportunities for MSMEs and firms from developing countries to participate in GVCs by allowing them to get around obstacles, such as poor access to information and segmented capabilities, that previously prevented them from joining (Antràs 2020). E-commerce marketplaces and similar platforms can help reduce fixed transaction costs, such as finding products or customers, facilitating payments, and reducing information asymmetries. But although digital platforms can make GVC participation accessible for more players, poor infrastructure and limited digital capacities still leave many excluded.

The digital platform economy also poses regulatory challenges. For one, unnecessary consolidation among digital platforms needs to be avoided given the importance of competition between digital platforms to provide more equitable access to users and lower barriers to entry. An increasing concern besides the potential gatekeeper effects posed by monopolistic digital platforms is the amount of user data and information collected by them that potentially "lock in" buyers and sellers, which feeds into the lack of competition (Antràs 2020). Price discrimination enabled by effective advertising and product customization by utilizing user data can also reduce consumer surplus.

There is a strong need to ensure access to ICT infrastructure and upgrade education to bring all players into the digital platform economy (ADB 2021). Kang, Bacate, and Ramizo (2020) note the importance of financial readiness, including access to digital payment systems, consumer protection, and secure servers. Good governance in general is needed to bring in and foster the types of businesses that will lead to GVC upgrading and high-value segments in supply chains.

Just as the emergence of digital platforms disrupted the international economy, new technologies on the horizon signal future changes. Antràs (2020) posits that digital ledger technology will have a significant effect on GVCs, making tracking and tracing easier and allowing for better verification. Other scholars, including Strange and Zucchella (2017), note the new digital economy is still developing. Rehnberg and Ponte (2016) note the Internet of Things and 3D printing have considerable potential to change GVCs and their players. And the COVID-19 pandemic has both expanded e-commerce and underscored the fragility of some supply chains. This has revealed the need for diversity to accelerate resilience, which may prompt the reconfiguration of the GVC landscape, including near-shoring, regionalization, and reshoring. The role of digital platforms due to their inherent interplay with sourcing, production, marketing, distribution, and service networks will likely continue to be crucial for shaping GVCs in the future.

The potential for new technologies and the continuing trend of changing GVC participation and participants means there is ample room for further research. More study is needed on whether the nonrelational governance of GVC transactions fostered by some digital platforms carries equal benefits to other relational GVCs since these transactions lack trade in intangibles, like intellectual property transfer and know-how. GVCs and digital platforms have undoubtedly brought more players into the international economy, but better data and further investigation are needed to understand the role these platforms have for MSMEs and international trade.

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