



Free competition in the post-pandemic digital era

The impact on SMEs

Filipe Da Silva
Georgina Núñez



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Filipe Da Silva
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Introduction

The emergence of disruptive technologies and innovations as a result of the microelectronic revolution (computers, Internet, robots and artificial intelligence) has led to a consensus on what is known as the era of the digital economy. This includes big data, digital platforms, algorithms, “Big Tech” companies, the payment revolution, e-commerce and so forth. In recent years, technological developments have pushed the boundaries, revolutionizing communication, business strategy and especially the way companies compete. Moreover, the current crisis deriving from the coronavirus disease (COVID-19) pandemic marks a clear turning point and highlights the urgency of reshaping the markets. The recent experience may even have changed the dynamics of the traditional debate of Arrow (1972) versus Schumpeter Mark II (2008).¹

Competition in the digital economy has evolved mainly through the incorporation of innovations in business models and strategies, including the widespread use of algorithms, information technologies, artificial intelligence, machine learning and big data. At the centre of the disruptions lie the “Big Tech” companies, due to their controversial business strategies and the substantial market power that they have achieved over time. The fast pace of mergers and acquisitions (M&As) among these companies represents a concern for competition authorities in a large number of countries, and there is even talk of breaking up the companies.² Furthermore, the relationship between innovation and market power has intensified to an alarming degree.

The literature highlights the limitations of the methods used by the regulatory institutions that oversee competition. At the same time, the analysis must include non-price aspects of competition, such as quality, variety and innovation. What is needed, then, is an active competition policy that is aligned with industrial policy and that goes beyond the classical theory of competition focused on

¹ This debate led to the conclusion that the creation of innovations does not depend on firm size, but rather derives from many other variables, such as the industry.

² See *BBC News* (2020).

consumer welfare and market contestability.³ Competition policy is an integral, permanent and substantial part of industrial policy,⁴ which includes the development of technological capabilities, market access, job maintenance and the repositioning of firms' competitive capacity in the market.

Proposals for addressing the challenges of the digital economy include incorporating the perspective of smaller firms in the discussion on the protection of competition and guaranteeing their survival, insertion and evolution in the value chain.⁵ These firms play an even more important role in the digital economy than in the traditional economy. The challenges posed by the digital economy require greater coordination between the two spheres of competition protection—the law and the economy—because the technology often exonerates those involved. In this document, we analyse the changes in competition models in light of a broader definition that includes not only consumer welfare, but also industrial policy and the new role of the State in the current digital context. The next section presents an analytical and methodological framework that incorporates elements that define the current context of competition policy in the digital economy, the insertion of the different firms that make up the productive economic landscape and the growing importance of data in this economy.

³ Industrial policy and competition policy should act in concert, since the infringement of competition law goes well beyond cartel activity, the abuse of market power and anti-competitive mergers. There are other industrial policy measures, such as those related to international trade and procurement, that may be outside competition law but that still threaten competition (UNCTAD, 2009).

⁴ According to White, quoted in UNCTAD (2009), industrial policy is understood as "a concerted, focused, conscious effort on the part of government to encourage and promote a specific industry or sector with an array of policy tools" (p. 4).

⁵ According to UNCTAD (2019), "the market power and dominance in certain markets of key platforms affect small innovative companies and their access to and survival in these markets" (p.3).

I. Theoretical framework for competition and the impact of the digital economy and the COVID-19 pandemic

Competition theory and the related legal instruments have faced important challenges in terms of their efficiency for guaranteeing free and fair competition in the digital markets, a situation that is exacerbated by the current health crisis and growing digitization. The existing legal frameworks, decrees and laws are no longer effective for meeting the challenges that the digital economy has raised. In the world context and especially in the region, the regulatory challenge is even greater, as competition policy, consumer welfare and economic development through the appropriation of technological capabilities gain importance.⁶ This complexity has intensified due to the impact of the digital economy on the pillars of competition. Key market concepts, notification thresholds, price levels, vertical and horizontal integration, the Small but Significant and Non-transitory Increase in Price (SSNIP) test, market concentration as measured by the Herfindahl-Hirschmann Index (HHI) and the geographic factor present limitations for integrating and analysing competition policy. In other words, the digital economy has made it more difficult to evaluate the markets' ability to respond to the new challenges that are emerging.

When price is at the centre of competition practice, as prescribed by the Chicago school, there is no space for competition policy action if prices are not affected,⁷ since the focus is strictly limited to consumer welfare. The only negative effects of mergers and acquisitions (M&A) and market concentration would be those that affect prices, so if a merger results in greater market efficiency—lower prices and more efficient production—then there is no reason for the competition authority to intervene. Even if a merger does not generate a price reduction, there is no reason that it should not be approved, since the more efficient

⁶ According to UNCTAD (2009), “competition refers to rivalry among firms in the marketplace. It also extends to envisaged or potential rivalry. *Competition policy* refers to government policy to preserve or promote competition among market players and to promote other government policies and processes that enable a competitive environment to develop” (p. 3).

⁷ According to UNCTAD (2010), the objectives of competition law are “to control or eliminate restrictive agreements or arrangements among enterprises, or mergers and acquisitions or abuse of dominant positions of market power, which limit access to markets or otherwise unduly restrain competition, adversely affecting domestic or international trade or economic development” (p. 2).

production will alleviate cost pressure in the future, which maximizes consumer welfare. From this perspective, any concentration that generates economies of scale or guarantees free-of-charge mechanisms, which is normal in the context of the digital economy, is efficient from a consumer perspective.

According to Crémér, De Montjoye and Schweitzer (2019), the role of data, economies of scale, network effects and strong economies of scope, responsible for the emergence and growth of digital ecosystems, are the main characteristics of the digital economy. In this context, the focus on consumer welfare allows the evolution of market concentration and data accumulation, and it is unable to identify the large incentives and dangers of data monopolies (or “data-opolies”) and digital conglomerates. This situation has led competition authorities around the world to overlook data as the real goal of data-driven mergers in their definition of the relevant market. In the context of digital conglomerates, the idea of using the broadest definition of the relevant market (5% to 10% of the price, according to the SSNIP method) to analyse an M&A has created problems for adjacent markets, as defined by competition institutions. At the same time, companies have diversified their products to survive the pandemic, which raises an additional challenge for assessing the relevant market. While recognizing the authorities’ capacity to wrestle with broader relevant markets, competition policy defines the relevant market taking into account the fact that the indirect impacts, deriving mainly from the data and data complementarity, are more determinant in the digital economy. Box 1 describes different digital markets and the main anti-competitive practices that they engender.

With the digital economy, the definition of vertical and horizontal integration is also complex, due to the difficulty of identifying the type of integration produced in the market (forward or downward in the value chain), given the global nature of the companies, the role of data and the business model of expanding into adjacent markets (or digital conglomerates). In classical theory, horizontal integration would not lead to barriers to entry and the abuse of market power, because the firms are acting in totally different relevant markets. However, “datafication” (i.e., the flood of data) and digital conglomerates have changed this perspective.⁸ The resulting position of the data-opolies gives the incumbents enormous advantages and facilitates the improvement of algorithms, price discrimination and the creation of barriers to entry in various markets. It is argued that barriers to entry and contemporaneous integration transcend the original framework, moving towards a theory in which privacy and data protection are just as important as barriers to entry, as is the case of prices in classical theory.

The two-sided model of digital platforms raises major challenges for the use of the traditional SSNIP method. With these platforms, on one side there are no prices, and on the other prices are usually competitive. In these markets, the provision of data by the user is the required payment for access to a “free” digital platform or service. When the same company provides several of these services, or when databases are merged through M&As, the company’s market power surges.

On the demand side, monopolies generate changes that can translate into harm to consumers. According to traditional competition theory, the harm caused to consumers by monopolistic practices includes high prices, fewer products, little diversity and a reduction in quality. In a digital model, where usually there are no prices on one side (or they are competitive), algorithms reduce search times and offer products in line with consumers’ preferences and the price they are willing to pay; and scale and network effects generate better quality for the users. Consequently, deadweight loss models are not capable of identifying the real damage to consumers. In this sense, it is argued that in the traditional economy, market power is reflected in the ability to keep prices above market prices, while in the digital economy, it is reflected in the ability to keep quality low (data protection, for example).

⁸ According to Sillanpää (2019), a narrow market definition, in the case of data-based technology companies, can cause the regulator to overlook the broader effects of a merger between technology companies and other data market participants, which guarantees the technology companies ownership of a larger quantity of data.

Box 1
Types of digital markets

Digital markets can be broken down into e-commerce markets and digital platforms, both of which have become increasingly important for SMEs and consumers during the pandemic. Despite their similarities, they require different analytical perspectives.

The main characteristics of e-commerce are a large number of vendors, low prices (including low marginal costs) and tough competition. In contrast to digital platforms, e-commerce is a digital market where prices still matter, under the traditional scheme. Therefore, competition authorities must primarily monitor possible barriers to entry, vertical restrictions, technology-enhanced collusion and algorithmic collusion in the marketplaces. From the perspective of SMEs, e-commerce is the main channel for access to markets and value chains, so it requires special attention.

Digital platforms, in turn, are characterized by high fixed costs and low variable costs (economies of scale), the prominent role of data and network effects, the role of intellectual property and innovation in the competition model and the indirect effect of prices on consumers.^a The main threats to competition are restrictions on multi-homing, non-neutrality, the control of data traffic, biased searches, exclusivity clauses, predatory (or killer) acquisitions and the enormous power of algorithms (amplified by the existence of data monopolies). From the perspective of SMEs, the biggest impacts come from the margins charged, the lack of transparency in business models, self-preferencing, dumping and non-neutrality.

Source: C. Beaton-Wells, "Competition Lore", 2019 [online] <https://competitionlore.com/>.

^a Although they do not pay directly for the services, consumers indirectly pay the cost of advertising on digital platforms when they buy the products.

The following sections analyse the specificities of the challenges identified in this chapter, as well as anti-competitive practices that mainly affect micro-, small and medium-sized enterprises (MSMEs) and the generation of innovations in the markets. We also discuss the framework for an integrated competition and industrial policy to successfully achieve a degree of permanence in the post-pandemic recovery.

II. Industrial and competition policies aligned with the digital era

A modern competition policy that takes digital issues into account has a role beyond that assigned by traditional theory. In the current scenario of the pandemic, the impact on the productive sector necessitates a broader role for competition policy. Competition policy, as an integral, permanent and substantial part of industrial policy, encompasses the different dimensions thereof (ECLAC, 2020). Crucelegui Garate (2020) considers that competition and consumer protection policies are complementary to trade and industrial policies. In this sense, these policies play an important role in achieving the Sustainable Development Objectives.

The post-pandemic recovery process of some hard-hit sectors accelerates a trend that was underway prior to the health crisis. In this process, there is already a clear need to restructure the productive, technological and value chain sectors, in particular in the MSME sector, where there are fewer opportunities for integration. In the region, competition policy has been used as a tool to promote the economic recovery. In the seven countries analysed, the authorities in Brazil, Chile, Colombia, Peru and Mexico have allowed cooperation among companies to accelerate the economic recovery.⁹ Given the context, as well as forecasts for the current pandemic period by the Economic Commission for Latin America and the Caribbean (ECLAC) available in the Digital Repository, the adoption of this perspective in the region is urgently needed.¹⁰

It is argued that the action area of competition policy should, at least theoretically, contribute to improving productivity, without neglecting consumer protection. When competition policy moves away from the traditional guidelines, it contributes significantly to the development of technological

⁹ However, UNCTAD (2009) warns that care must be taken in using such measures, because “recession cartels in declining industries may be allowed or encouraged by government. These may limit production or capacity. Depending on rivals’ reactions, they may be able to maintain higher prices” (p. 15).

¹⁰ According to ECLAC (2020a), the current scenario in Latin America shows a significant drop in the growth rate of -7.7% and a capital retreat equivalent to approximately 10 years of capital inflows to the region.

capacities, market access, job maintenance and the repositioning of firms' competitive capacity (Possas and Borges, 2008). According to Dosi and Tranchero (2018), absolute (not comparative) technological levels are an essential motor of trade performance and, ultimately, of well-being. In this sense, when industrial and competition policies act in concert to promote technology appropriation, which includes combating predatory acquisitions, they can improve consumer welfare.

Cimoli, Dosi and Stiglitz (2008) indicate that technological learning incorporates a high degree of imitation, reverse engineering, minor product and process modifications and explicit copying, especially in the initial phase of the catching-up process. The capacity for technology absorption and appropriation, which is affected by intellectual property regimes, has been used as a barrier to market entry (Cimoli, Ferraz and Primi, 2009). These are crucial aspects of product development and innovation that fall under the rubric of competition policy.¹¹ Many industries that maintain sus their market power through property rights and not through innovation, in the context of the dynamic economy, are in fact inhibiting competition, appropriation and development and, therefore, reducing the general well-being of the economy.

The large digital companies are able to innovate very rapidly and to patent their innovations at a lower cost due to the scale of their business; this highlights the importance of having a property rights and patent law, in line with the new conditions of the digital economy, that contributes to the success of smaller firms. Box 2 identifies the relation between intellectual property and technology protection, as well as the relation between intellectual property and some aspects of performance in the pharmaceutical sector related to the creation of the COVID-19 vaccine, which can be expanded to diverse areas of the economy. These aspects highlight the need for adopting policies that support not only SMEs, but also—and most importantly—innovation and true innovators.

Guaranteeing technology appropriation and development in a country requires not only an appropriate intellectual property scheme, but also the adoption of a dynamic view of competition. It also demands consistency between industrial, macroeconomic and foreign exchange policies and an innovation-oriented competition policy. This approach can generate a higher degree of welfare through increased innovation and a higher level of competition in the markets. We argue that a dynamic perspective and an approach oriented towards the protection and promotion of small businesses, in the area of intellectual property and data access, will have a positive impact on the productive economic landscape.

Both the internal and external action areas are relevant for competition policy. The static view considers only internal competition (related to the behaviour and interaction of national/regional firms), whereas the dynamic view considers both internal and external competition (where the behaviour of foreign companies affects national/regional firms). In the context of the digital economy, the adoption of a perspective that takes into account both the internal and external climate is necessary to promote market integration and development. The pandemic makes it even more necessary to evaluate both internal and external competition, as well as the increasingly imminent risks of cross-border cartels in data-sized economies, which have accelerated the need for greater interaction and cooperation among competition authorities at the international level (Horna and Papa, 2018).

¹¹ According to Cimoli, Ferraz and Primi (2009), competition policy, as an integral part of industrial policy, requires a broad and focused set of compatible policies, including macroeconomic, foreign exchange, tax, fiscal, public investment, labour market and income distribution policies. According to Erber (2011), to perform this role, macroeconomic and industrial policies must act in concert.

Box 2
Technology and intellectual property in the pharmaceutical industry

Due to the impact of the spread of COVID-19, there is a growing concern^a on the part of governments, the scientific community and society regarding monopolies in the pharmaceutical sector and the resulting scenario of supra-competitive prices in the midst of the pandemic. To combat such practices, countries around the world have used compulsory licenses.^b

Some of the alternatives to the intellectual property problems in the sector are as follows:

- Introduction of a prize fund mechanism: In this model, governments establish a fund for solutions or advances on given diseases, which would be awarded to the competitor for achieving the objective.
- Crowdfunding: These programmes are a useful tool in the fight against biased research. The idea is to create funds for a wide variety of diseases, so as to avoid the so-called 90–10 phenomenon where 90% of the market is interested in creating solutions for the same limited set of diseases that affect 10% of the population.
- Clinical trials: Government action in the construction of a mechanism for reducing costs. Clinical trials represent 50% of the total costs of developing a new drug.
- The creation of common-use laboratories and technologies: The creation and maintenance of technology that can be used by everyone. According to Stiglitz and Jayadev (2010), many of the monopolies in this industry benefit from knowledge produced largely by public institutions.
- Patent pools: These agreements lead to knowledge sharing and the division of royalties.
- Open science.

In sum, to increase competition in the sector and improve the market position of MSMEs, it is necessary to create copyright laws that do not support monopolies but that do promote innovation and thus competition. Working on property rights is fundamental for ensuring that competition policy is an integral part of industrial policy.

Source: J. Stiglitz and A. Jayadev, "Medicine for tomorrow: some alternative proposals to promote socially beneficial research and development in pharmaceuticals", *Journal of Generic Medicines*, vol. 7, No. 3, 2010; F. Da Silva, J. De Furquim and G. Núñez, "La libre concurrencia en la economía digital: las micro, pequeñas y medianas empresas (mipymes) en América Latina y el impacto del COVID-19", *Project Documents* (LC/TS.2020/142), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2020.

^a For example, the company Gilead Sciences, creator of the controversial drug remdesivir, reacted to rumours that its medication could be effective against coronavirus by asking the U.S. food and Drug Administration for "orphan drug" status, thereby acquiring a preferential position establishing an even stronger monopoly for the drug.

^b See Da Silva, De Furquim and Núñez (2020).

The reactivation of economies, sectors and global chains is a challenge that requires an integrated industrial and competition policy that encompasses the digital economy. That is, the required policy must see data as a necessary input for innovation and increased productivity. This demands an intelligent use of vertical and horizontal policies. The debate between those for and against vertical industrial policy must be superseded. The latter argue that industrial policy generates competition distortions, such that only horizontal policies should be used. However, in a crisis scenario with such an unequal sectoral impact, vertical industrial policy becomes a necessity if countries are to rescue their sectors and use them as the basis for promoting development. Dosi and Tranchero (2018) argue that a successful vertical policy could improve productivity in a given sector (by increasing the absolute advantage in that sector only). The increase in productivity and, therefore, in profitability in the sector drives the comparative advantage adjustment mechanism and changes the intersectoral allocation of resources, leading to a structural change in the direction indicated by the comparative advantages.

The modernization of the concept of industrial policy and the use of vertical policies in the current context are crucial for achieving the objective of economic recovery and development. In this sense, the promotion of interoperability could be considered a horizontal industrial policy since it affects all sectors. Another example of an industrial policy for the digital era is the Digital Economy Partnership Agreement (DEPA) signed by Chile, Singapore and New Zealand in June 2020, which

guarantees cooperation, free circulation and cross-border mobility of data.¹² In this agreement, it is understood that the free flow of data can provide a huge incentive for innovation in the digital economy. All these factors are important for achieving the development objective through technology appropriation; that is, the coordination of industrial, competition and data-access policies is crucial in the digital era.

¹² The DEPA includes the free flow of data, non-discriminatory treatment of digital products and the non-imposition of the forced location of computer facilities. This pioneering agreement aims to provide opportunities for including more people and MSMEs in the global economy. Objectives include building a trustworthy data flow ecosystem, ensuring that public data are open and facilitating cross-border flows (Undersecretariat for International Economic Relations, 2020).

III. Innovation and monopoly creation

A traditional competition policy based on prices for the identification of consumer harm (the principles of the Chicago school) is no longer sufficient in dynamic sectors, such as the new Internet businesses where innovation governs competition (Crucelegui Garate, 2020). Given the new form of anti-competitive practices and a more aggressive acquisition strategy, the generation of innovation becomes the main proxy for consumer welfare and the functioning of the market (Monopolies Commission, 2015).¹³ In other words, there needs to be a paradigm shift towards a Schumpeterian model of dynamic competition capable of determining the role of innovation and the harm to welfare caused by its absence (Administrative Council for Economic Defense, 2019).¹⁴ This interpretation is aimed at preventing incumbent firms from blocking the creative destruction process generated by new entrants, given that data-opolies and the resulting data barriers can cause such effects.¹⁵ A shift toward this model is important because innovation is the driver of countries' development. Likewise, M&As that threaten the level of innovation or reduce the rate at which innovation occurs can become a problem for the consumer and for the economy in general.¹⁶

In this sense, Crucelegui Garate (2020) considers that the goal of digital companies is not the creation of new products, but rather the protection of existing products by hindering competitors' access through interoperability. While the constant improvement in services, products and prices is undeniable, the digital market segment characterized by dynamic competition or innovation has demonstrated a very different behaviour than predicted by Schumpeterian theory. That is, in

¹³ According to De Streel and Larouche (2015), innovation, whether complementary or disruptive, is often considered good for the well-being of the economy in general.

¹⁴ According to the Mexican Federal Economic Competition Commission (COFECE, 2020), innovation plays a merely incremental role in the economy. In the digital economy, however, the objective is to change the market structure through disruption.

¹⁵ The disappearance of a "true" innovator can represent significant harm to welfare, since it affects factors such as knowledge generation, the adoption of new technological methods, the economic machine and the flow of information, as highlighted by Freeman (2008).

¹⁶ It has been argued that it cannot yet be determined empirically whether the M&As are truly anti-competitive (MacLennan, Kuhn and Wienke, 2019).

Schumpeterian markets, firms do not usually maintain a dominant position (Beaton-Wells, 2019). If that is happening, it is because the market-cleaning mechanism (disruptive innovation) is not reaching the market, and industry dethronement is not functioning, as suggested by Christensen (1997).¹⁷

In the Latin American context, competition policy, with a dynamic perspective, is even more important to the extent that the strategy of acquisition and expansion into adjacent markets can threaten the success of economic development and technology appropriation. According to Possas and Borges (2008), newly industrialized countries should design a competition policy specifically to address the local harmful effects of M&As launched by large multinational corporations. When we acknowledge that the traditional competition model is not capable of identifying the backbone of the economy, it becomes clear that industrial policy and competition policy have the same basis (Possas and Borges, 2008). Competition policy must guarantee free competition and, therefore, the market entry of innovators, many of which are MSMEs that currently have neither the power nor the financial conditions to sue for intellectual property infringement. They are thus left with no option other than to be bought out by firms with greater market power, which is what happens when true innovators enter the so-called kill zone of the incumbents.

Another characteristic of the digital economy is a shift in perspective regarding a company's ownership. It is well-known that the Big Tech companies' innovation rate is correlated with their number of acquisitions, which leads to two ideas that derive from this perspective shift. The first is that the objective of the acquired business or start-up is to act as if it were an extension of the Big Tech research laboratories; the second, that this strategy reduces the uncertainty inherent in research and development (R&D). Currently, any business or start-up that was acquired under this shift in perspective deriving from the digital economy's acquisition market is considered successful.

Technology appropriation and the production of innovation are an important part of the development process, and acquisitions can weaken that process. In this sense, Kerber (2017) argues for the importance of evaluating companies' specialized assets.¹⁸ The superimposition of resources or assets can represent a predatory acquisition.¹⁹ Kerber argues that it is therefore important to assess resources and assets such as laboratories, intellectual property rights, patents and registered trademarks, knowledge resources, experience, learning-by-doing, highly qualified R&D personnel, data analysis capacity and databases.

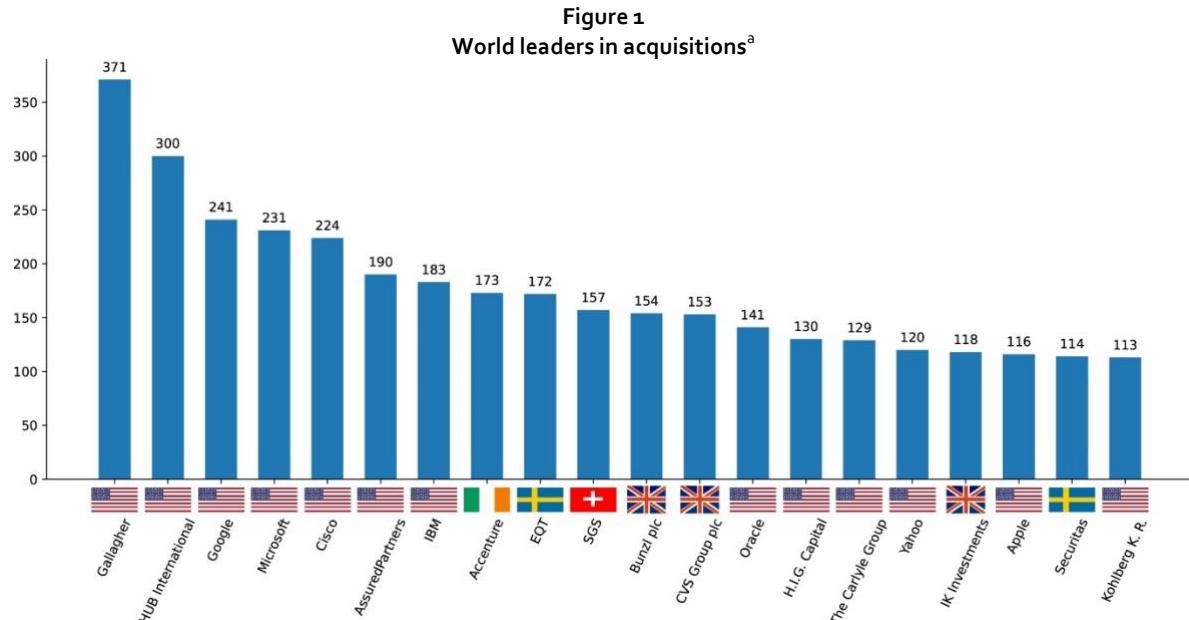
Figure 1 illustrates the importance of the acquisition strategy in the digital economy. Of the 20 largest global acquirers, more than 50% are based in the United States, including the top seven companies.

According to Sillanpää (2019), the connection between innovation, data, acquisition and market power is clear in the digital economy. Consequently, a competition policy for the digital economy must aim to prevent technology firms from acquiring critical data and platforms that allow them to accelerate the collection of proprietary data and thus to establish undue market power and create barriers to entry.

¹⁷ Airbnb (hotels) and Uber (taxis) are examples of digital economy innovations developed by start-ups that ended up holding a monopoly position.

¹⁸ An important case on specialized assets is the European Commission's approval of the merger between Dow Chemical and DuPont in 2017. The approval was granted with the condition that DuPont had to divest of significant specialized assets in its global pesticide business, in this case its global R&D organization.

¹⁹ Cassiman and others (2005) show in their empirical study that the effects of innovation depend on the technological relationship of the merged companies, because R&D is greater if the merged companies have complementary technologies.



Source: Crunchbase, "Discover innovative companies and the people behind them", 2021 [online database] <https://www.crunchbase.com/>.

^a Google has been buying related businesses such as web browsers (Chrome), operating systems (Android) and hardware (Nexus), but it has also expanded into areas that are unrelated to its original business line, such as home automation (Nest), telecommunications infrastructure (Fiber), automated driving systems (Google Car), travel (JetPaq), clean energy (Xively) and many others. This is not an isolated case among the Big Tech companies, but rather a business strategy that is currently on the rise and whose goal is the acquisition of data, potential competitors, disruptors, innovation, R&D cost and risk reduction and so forth.

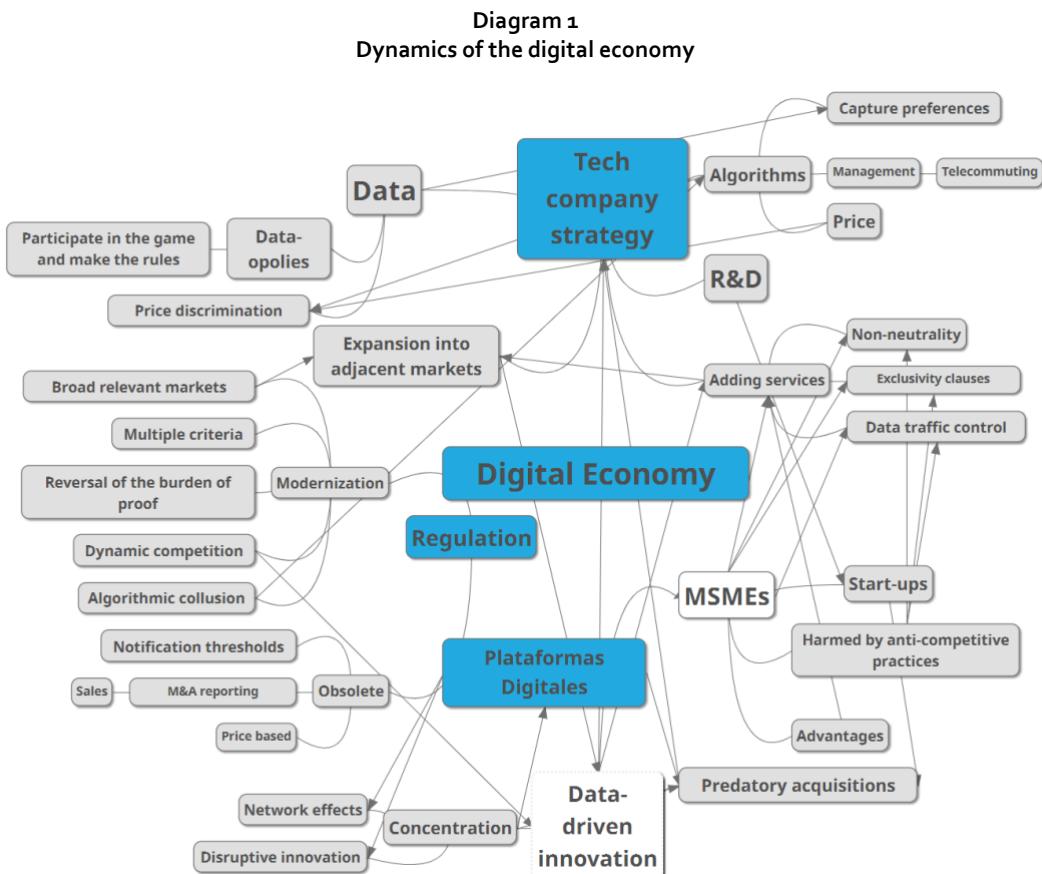
Nevertheless, the complexity of these innovations can often also become a source of monopoly creation, and network effects can weaken the impact of dynamic competition in markets where they are significant. That is, in these markets, the incentive to innovate is lower, and the market is not easily contested.²⁰ In this regard, Motta (2004) indicates that these markets are naturally associated with the existence and dominance of monopolies. He argues that interoperability must be promoted independently of the presence of anti-competitive practices in digital markets. However, Kades and Morton (2020) defend the use of interoperability as a mandatory rule to be adopted by competition authorities to fight the possible exploitation of network effects in digital markets. The loss of market power and the resulting entry of new players would have a positive impact on competition and innovation.

To guarantee fair competition, the authorities must use the same tools as those used by the companies to abuse their market power; in other words, technology must revolutionize both sides (market competition and market regulation). The more traditional theory of competition policy assigns a much more passive role to the legal framework, that is, intervention solely in the event of a market failure (Possas and Borges, 2008). Evidence of this passive position includes the dependence on leniency programmes in the detection of cartels. In the context of the digital economy, the continued use of the passive approach will generate severe losses to society, because the effects of anti-competitive practices materialize much faster in the digital markets. Therefore, what is currently needed is a policy that can predict and get ahead of the consequences of behaviours that go against competition. In this sense, Crémer, De Montjoye and Schweitzer (2019) recommends the use of specific sectoral regulations to tackle the different challenges. The digital era demands more from the competition authorities: in addition to adding other areas of analysis, such as data science, and ensuring an adequate infrastructure, it is necessary to acknowledge that an approach based on the use of horizontal measures

²⁰ See definition of contestable market [online] <https://stats.oecd.org/glossary/detail.asp?ID=3178>.

alone is no longer effective for addressing the current complexities. In sum, a case-by-case analysis is needed, together with the recognition of the importance of budget issues, to address the challenges imposed by the digitalization of the economy. At the same time, a case-by-case analysis can increase the possibility of capture of the competition authority.

Diagram 1 identifies the different aspects of the digital economy and summarizes the main points of competition policy laid out in the analysis in this section.



Source: Prepared by the authors.

The diagram illustrates the connection between the strategies of the technology companies, the data, the need to modernize the regulatory tools, MSMEs, the anti-competitive practices carried out on digital platforms, the strategy of expanding into adjacent markets, the use of algorithms and the relation between innovation, network effects and market concentration. It shows the complexity of the relationships in this new economy, where multiple factors such as network effects and platform marketplaces can be beneficial or harmful to the degree of competition in the markets.

A. Market concentration and competition policy

Market concentration is an important aspect of competition policy. The dynamics of the digital economy and the impact of the pandemic on sales has called into question the viability of traditional tools for protecting competition against concentration acts in many countries.²¹ The COVID-19 crisis has also raised the challenge of addressing cases involving the failing-firm defence in the midst of uncertainty. M&A reporting based on companies' annual sales and the use of the Herfindahl-Hirschmann Index (HHI) to measure market concentration have proven to be ineffective for dealing with, for example, predatory acquisitions.²² The latter are an important part of current business models, to the extent that the United States has responded to the volume of acquisitions by the Big Tech companies²³ by decreeing a review of all their acquisitions between 1 January 2010 and 31 December 2019 (Feiner, 2020). Based on 35,000 pharmaceutical projects, Cunningham, Ederer and Song (2020) show that 6.4% of transactions in the pharmaceutical sector were killer acquisitions. Box 3 describes predatory acquisitions and their effects on the economy. In Brazil, the Competition Law (Law No. 12.529, of November 30) grants the Administrative Council for Economic Defence (CADE) the prerogative to review any M&A, even when the mandatory reporting requirements are not activated (with a statute of limitations of one year from the date of the transaction); this is an important tool for combating such practices.

According to McLean (2020), current competition theory has failed in the areas of notification thresholds and the assessment of future competition.²⁴ Table 1 illustrates the weakness of the M&A reporting requirements in the region for combatting predatory practices in the digital economy.²⁵ First, the table shows that there is no standard with regard to the regulatory frameworks in the different countries, and the values used are generally high relative to the values recorded in the digital economy (many acquisitions are made when the target firms do not yet have significant turnover). Furthermore, the transaction value is rarely used as a parameter. Second, the relevant market is frequently used as a parameter, which, as discussed above, is a complicated issue in the new economy.

²¹ Countries in the region, such as Chile, have expressed concern about a post-pandemic increase in market concentration, since many acquisitions, which would have been reported under normal circumstances, have not been reported due to the drop in sales.

²² With regard to the acquisition strategy, two key questions need to be answered. Are the increased acquisitions by the Big Tech companies in different areas and sectors consistent with the idea that the data are a necessary input for innovation? Or are they an effort to protect their market position by not allowing competitors (potential or not) to increase their market power and thereby become a threat?

²³ According to Crunchbase, the five largest companies in the digital economy executed a total of 754 acquisitions in the first half of 2020 (Amazon: 86; Apple: 114; Facebook: 85; Google: 240; and Microsoft: 229).

²⁴ According to the Monopolies Commission (2015), the purchase price is a better parameter than turnover. McLean (2020) suggests an "economic goodwill test" based on the value of the target firm's net assets as a share of the total transaction value, while also arguing that there are conglomerate acquisitions and killer acquisitions. The former constitute a major challenge in relation to M&As due to the formation of digital conglomerates; the latter are executed with the goal of eliminating the acquired firm or its products.

²⁵ In Brazil, in the case of Naspers/Delivery Hero, the Administrative Council for Economic Defense (2019) found strategies, such as the digital platform iFood (a Brazilian delivery company), that should be permanently monitored due to their aggressive acquisition strategy. The company has bought out several small start-ups, which could represent a predatory practice that is not being identified under the current legislation.

Box 3
Killer acquisitions

The acquisition strategy facilitates expansion into adjacent markets. The objective of frequent acquisitions is to give the acquirer complementary functionalities, sometimes via cannibalization. The greater funding and project execution capacity of mature incumbents contrasts with the negative effects of the mergers.

Effects triggered by the incumbents:

- The buyer was going to expand into adjacent markets independently of the acquisition, so there is a loss of competition from innovation and a reduction of the innovative effort in the economy due to the fact that the buyer will not enter the market organically.

- Loss of social welfare, since the potential acquirer will not develop a new service or product to put on the market.

General effects:

- Loss of future competition and loss of competition from innovation due to the mitigation of the entry of the acquirer. In the absence of the acquisition, the buyer would have competed in the same innovation market as the target firm, which would increase welfare.

- Reduction in the general level of innovation.

- Formation of conglomerates and increased market concentration, which increase the risk of anti-competitive practices.

Source: C. Caffarra, G. Crawford and T. Valletti, "How tech rolls': potential competition and 'reverse' killer acquisitions", OECD on the level, 27 November, 2020 [online] <https://oecdonthellevel.com/2020/11/27/how-tech-rolls-potential-competition-and-reverse-killer-acquisitions/>.

Table 1
Reporting system of countries in the region
(*In thousands of dollars*)

Country	Transaction	Joint assets	Joint sales	Separate sales	Relevant market	Turn over	Stock Shares	Business	Date
Argentina	11,000	x	55,000	x	x	x	x	x	2018
Bolivia (Plurinational State of)	x	x	x	x	x	x	x	x	x
Brazil	x	x	x	x	x	149 133.6	x	x	2011
Chile	x	x	107 600	19 400	30%	x	10%	x	2019
Colombia	x	13 918.2	x	x	20%	13 918.2	x	x	2019
Costa Rica	x	13 573.5	13 573.5	678 675	x	x	x	x	2019
Ecuador	x	x	80 000	x	30%	x	x	x	2011
El Salvador	x	180 000	x	x	x	216 000	x	x	2018
Honduras	x	19 529 148.71	601 322.4	x	25%	x	x	x	2014
Jamaica	x	x	x	x	x	x	x	x	1993
Mexico	151 488	403 968	403 968	403 968	x	x	35%	55 000	2014
Nicaragua	x	x	x	x	25%	119 623.473	x	x	2016
Panama	x	x	x	x	x	x	x	x	2007
Paraguay	x	x	x	x	45%	346 000	x	x	2016
Peru	x	x	141 600	21 600	x	x	x	x	2016

Source: Prepared by the authors, on the basis of competition regulations of the countries of the region.

To address the challenges raised by the digital economy in the area of concentration, the following points should be considered:

- Assessments should take into account not only sales, but also the transaction value, the companies' turnover, the relevant market and their actions.
- Reporting system thresholds should be reduced, given that in the context of the digital economy, the threat of concentration could arise from fledgling companies.
- Crémer, De Montjoye and Schweitzer (2019) recommend adapting competition law to reverse the burden of proof in digital markets characterized by network effects; that is, the acquirer must now demonstrate that its conduct is pro-competitive.
- Current laws cannot keep up with the rapid pace of change in digital markets, which can favour anti-competitive practices. The use of temporary or interim measures can help mitigate the damage of such practices.
- The use of multiple criteria may be sufficient for addressing the drop in sales and the killer acquisition strategy.

M&A analysis must also incorporate a data protection perspective, including aspects such as the level of data security provided, the scope of the data and the purpose for which personal data will be used. The information itself and the control over personal data should be part of the M&A analysis. It is important to recognize that when digital markets are involved, higher prices are not the main problems deriving from flaws in market concentration and reporting tools. These tools are very important for preventing a potential lack of innovation in digital markets.²⁶

²⁶ As Margrethe Vestager said, "when someone buys up an innovator, with a lot of good ideas but not yet much in the way of sales, we might not even have the chance to look at whether that merger will be bad for innovation" (Ribeiro and others, 2018).

IV. Data-opolies and data protection

Because data are an important input in the digital economy, it is crucial to discuss data protection and the acquisition of databases. The incentive for misuse and, therefore, for the improper extraction of sensitive consumer and business data is a critical issue. For example, during the COVID-19 crisis, some governments in the region have approved measures (decrees, regulations, etc) to support the crisis response using mobile applications (apps) that track developments in order to contain the spread of the pandemic. These apps have raised an alarm due to the quantity of sensitive data collected (ZeroFOX, 2020) and the need to protect the privacy of individuals through greater policy coordination.

Under the European framework of the General Data Protection Regulation (GDPR), an opt-in/opt-out system is being developed to manage user consent requirements, which provides a solution for people who do not want to be tracked across the network. In general terms, user data collection is much higher than it should be, because no one knows precisely which data are relevant or will be relevant in the future. According to Costa-Cabral and Lynskey (2015), excessive data retention, inadequate data security or reduced control over personal data could be equivalent to charging an excessive price. It is important to point out that a large share of the data is obtained without consent, since many users do not even know which data have been collected. According to the GDPR, data collection, storage and processing should only be carried out after the user has given consent; and that consent can be revoked at any time.

Data permeate all of the economy and disrupt traditional competition models. Through data, the digital economy gives rise to collusion, price discrimination, personalization, innovation, algorithms, business strategies and conducts. Kerber (2017) warns us of the emergence of data cartels. In the midst of the competition for data that characterizes the digital economy, regulators face a major challenge in terms of finding a balance between data-backed innovation, the cross-border flow of data and consumer privacy protection, all at the same time. At the centre of this challenge is the debate on whether the data should be viewed as a structure, a commodity (like oil) or an infinite intangible asset.

According to the first interpretation, data are a public good where restrictions to access are causing harm to the well-being of the economy, since they prevent firms from offering competitive

goods and services (Administrative Council for Economic Defense, 2019). Databases are non-rival assets, yet accessing them is difficult, and building them is even harder, due to the network effects. From the perspective of many MSMEs, data access is a major challenge for their survival.²⁷ Issues such as open science, open data, intellectual property, privacy and data protection have been introduced into the day-to-day work of authorities around the world. Adequate data access (with the appropriate safeguards) can generate a path to technology appropriation that is needed in the region. This can be addressed through the following recommendations:

- Governments must contribute to facilitating the flow of data, while also guaranteeing an adequate level of protection. Unnecessary restrictions on the free flow of data raise costs.
- A data market should be constructed, where massive amounts of anonymous data would be made available for a fee, similar to the compulsory licensing of a patent.²⁸
- Governments can also promote a sort of data centralization. For example, medical data for diagnostic applications or X-rays and automobile traffic data could represent an important input for innovation, which a large number of agents could access.
- Governments could also promote data cooperatives,²⁹ where multiple MSMEs aggregate their databases to generate big data.
- The use of blockchain can mitigate differences in terms of cybersecurity, promote so-called cyberimmunity, which is now crucial between micro and macro players, and thus ensure the functioning of initiatives like the data cooperatives. In a recent ECLAC survey—on the relation between disruptive technology and digital assets in Industry 4.0 and the risks of cyberattacks in logistics chains—an estimated average growth of digitalization of 34% could translate into a greater exposure to cyberattacks.³⁰
- Promoting the interoperability of digital markets is essential for efficient market functioning.³¹

On the importance of data in the digital economy, Sadowski (2019) outlines some of the reasons that data are so highly valued by both tech and non-tech companies. However, many of the data collected in the economy have not yet been assigned a monetary value (see box 4). That is, much of the data will only be useful following future innovation, which will then generate monetary value.

²⁷ Strategically, data can become a barrier to entry (e.g., when the possession of consumer data is essential for competing for market share), because they can facilitate collusion (data can be used to build algorithms that automate price agreements). Data can also affect third markets (e.g., data collected by a firm in sector X can be used to understand and satisfy consumers in sector Y).

²⁸ Database merging makes it relatively easy to identify the owners of the data, so competition solutions must go hand in hand with privacy solutions in the digital economy.

²⁹ <https://www.midata.coop/en/home/>.

³⁰ See Díaz (2020).

³¹ The Government of India has proposed a new bill that threatens the Tech Giants, in that it involves the creation of a universal database so that even competitors can access and use the data to generate innovations (Kalra, 2020).

Box 4
Data with monetary value

- (i) Data used to profile and distinguish people (hyper-personalization). Companies that use the Internet to market their products or services generally obtain their income through personalized advertisements. The so-called data brokers collect data to create folders of individuals and classify them into market segments. Retailers can charge different prices according to their customers' characteristics or analyse the data to make decisions on who is susceptible to a certain type of message or influence.
- (ii) Data used for system optimization. Processes can be made more efficient through the use of data to reveal how to eliminate waste, improve productivity and make more with less. Governments use algorithmic analysis to evaluate how to manage public services, traffic, disaster simulation, urban mobility, etc.
- (iii) Data used for situation management and control. The police use cameras and drones equipped with facial-recognition and license-plate-reading software.
- (iv) Data used to model event probabilities.
- (v) Data used to build things. Digital systems and services are founded on data. As services are transferred to platforms and devices become "smart," they also become data driven and are connected to the Internet to facilitate flow.
- (vi) Data used to increase the value of assets. Updating assets with smart technologies that collect data on their use helps to combat the normal depreciation cycle.

Source: J. Sadowski, "When data is capital: datafication, accumulation, and extraction", *Big Data & Society*, vol. 6, No. 1, January, 2019.

Given the importance and value of data in the digital economy, it is necessary to rethink traditional competition policy. The traditional interpretation is not capable of identifying the negative effects of data monopolies on consumers. In the digital economy, the definition of consumer harm can be very different, and the effects may be indirect. Stucke (2018) highlights some of the types of damage that data-opolies can cause to consumer welfare and the general economy (see table 2). Under traditional theory, the dimensions of welfare include improvements in the price, selection and quality of products and services. Under a more dynamic approach to competition, innovation is the fourth dimension. According to Costa-Cabral and Linskey (2015), there is pressure for the digital economy to consider data protection as the fifth dimension of welfare. Table 2 highlights the critical points, inefficiencies and risks for consumers and the economy in general, resulting from data monopolies.

Table 2
Data-opolies

Critical points	Inefficiencies and risks		
Lower-quality products with less privacy	Lack of differentiation in terms of privacy	Lack of differentiation in terms of data protection	
Surveillance and security risks	Governments can demand access to personal data	Risk of cyberattacks	
Wealth transfer to data-opolies	Accumulate data without paying for it	Appropriation of content: news, music, etc.	Behavioural discrimination
Loss of trust	Consumers provide incorrect data	Loss of welfare (deadweight in the digital economy)	
Significant costs on third parties	Reduction of data traffic	Search bias through algorithms	
Less innovation in markets dominated by data-opolies	Monitoring of disruptors and consumers (now-casting), influencing the market and getting a jump on innovation appropriation		
Social and moral concerns	Addictive nature of data-opolies' products		
Political concerns	Manipulation	Influence on the public debate	Influence on the perception of good and bad

Source: Prepared by the authors, on the basis of M. Stucke, "Here are all the reasons it's a bad idea to let a few tech companies monopolize our data", *Harvard Business Review*, 27 March, 2018 [online] https://hbr.org/2018/03/here-are-all-the-reasons-its-a-bad-idea-to-let-a-few-tech-companies-monopolize-our-data?mod=article_inline.

In the current economy, data are a key source of innovation, including process, product or administrative innovation; that is, they are inputs through both demand-pull and technology-push innovation effects. One example of the double effect in the use of data is Tesla, which uses data as the main source of its innovations.³² In an economy where the digital platforms are the biggest companies in terms of market value, the non-circulation of data can impede the creation of new platforms and innovations (Da Silva, De Furquin and Núñez, 2020). At the same time, data-driven mergers have given many companies unnecessary data access that represents a danger to consumer privacy. These acquisitions have generated predictive power and preference capture even when consumers do not want it, which, together with the sale of preferences (target advertising), creates major concerns about competition, data protection and cybersecurity. Data, in turn, have become the main intangible capital of the digital platforms and an asset for many non-digital firms.

According to Lev (2001), intangible assets take various forms, including assets backed by legal intellectual property rights, such as patents and trademarks and data, which generally are not legally protected. Despite the recognition that data have value, it is not easy to appraise, monitor and assign a price to data, which makes it difficult to recognize this kind of intangible asset on a company's financial statements (as a corporate asset). Mayer-Schönberger and Cukier (2013) describe the initial public offering (IPO) of Facebook in 2012 to illustrate the need to allocate prices to data. Facebook, following traditional accounting practices, reported assets of US\$ 6.3 billion prior to the IPO. However, the market assigned the company a total valuation of US\$ 104 billion. The authors argue that this gap, of almost US\$ 100 billion, represented intangible assets owned by the company—in this case, data. The difficulty of appraising intangibles has the potential to cause economic harm such as bubbles or the possible illicit enrichment of the owners of these assets. Heckman and others (2015) highlight the existence of a "market for lemons" when there is no price allocation mechanism for intangibles; in this case, the sellers have more information on the product than the buyers, which allows the sellers to charge more for the goods than is justified by their quality.

As an infinite intangible asset, the intensive use of data requires greater effective control on the part of market regulators. In this sense, data risk should be central to the investment analysis, since public information on these intangible assets is limited. In general, the risk level associated with intangibles is higher than in the case of other types of assets (physical or financial), which could translate into a risk for companies that pursue the blind accumulation of data as intangibles and for investors whose equity investments include shares in these companies. That is, the lack of a price allocation mechanism generates greater risk and volatility in the markets. The State may play the role of market maker, as suggested by Li and others (2014), which could reduce uncertainty, market failures and information asymmetries and thereby facilitate pricing data.

³² Tesla is a data-driven company based on the monetization of car data and innovation. Known for its high-end electric cars, Tesla has managed to increase its market value significantly due to innovations that the company has brought to the market. The advances in these systems in recent years reflect the company's strategy of data collection and automobile innovation, which is a perfect example of data-driven innovation. Tesla's cars are basically computers, so the company can extract and send data from the cars to build its automatic pilot. According to predictions by consulting firm McKinsey & Company, the car data market could generate US\$ 730 billion though 2030 (McKinsey & Company, 2016; Bertoncello, 2018).

V. Digital markets and anti-competitive practices

A. Non-neutrality

Competitors, mainly small businesses, that develop disruptive innovations usually introduce their products to the market through the established product network; that is, they have to use what is already built to eliminate the incumbents. In this sense, the digital marketplaces have become a big opportunity for SMEs. Thus, to strengthen competition and impede anti-competitive practices, these networks must be accessible to disruptive firms. This is the case of financial technology (fintech) firms, which usually occupy platforms' space in order to take advantage of already built network effects.

Non-neutrality has become a major adversity issue for competition authorities, but the combination of non-neutrality and self-preferencing is even more problematic since the former is not necessarily anti-competitive. Companies that use platforms to reach their customers with innovations are increasingly faced with competition from the platforms themselves. This is especially problematic in the context of the pandemic, since the platforms are the main digitalization channel for MSMEs. Many anti-competitive practices, which have become increasingly common, are motivated by non-neutrality.³³ The combination of non-neutrality and self-preferencing has several potential effects:

- Obstructing an innovator's products by diverting traffic to their own products, thereby weakening dynamic competition
- Generating interest in the creation of exclusivity clauses to avoid competition from smaller firms or strengthen their own products

³³ See *Jamaica Observer* (2020).

- Undermining an innovator's success through data theft -or imitation to improve their own products as a result of incumbents' power to monitor innovative conducts.³⁴

Non-neutrality³⁵ in the digital economy affects prices,³⁶ which limits price-based competition. This occurs because the platforms simultaneously offer their own products and services and charge other firms for the sale of competing products and services. According to IBRAC (2019), if the platforms are not in a winner-take-all market or are not natural monopolies due to product differentiation, then the platforms need exclusionary practices like those described above in order to dominate the markets. Additionally, since the objective and the advantage of tech firms are in the data, these companies can use predatory practices like the combination of non-neutrality and dumping in adjacent markets to strengthen or sustain their monopoly position in other markets. For example, Facebook has been accused of using such practices in the virtual reality market, which is rich in data and user interaction, in order to block the success of potential competitors.³⁷ The existence of non-neutrality on the part of digital platforms can be interpreted as a warning sign for competition authorities.

B. The role of algorithms

Collusion has been facilitated in the digital economy and may even have become undetectable by traditional standards. Currently, data and algorithms have moved away from traditional collusion towards tacit or technology-assisted collusion. Behind some algorithm routines are hidden collusive arrangements and business strategies with an unclear scope. According to UNCTAD (2019), "digital platforms have new business models and function with algorithms, which are designed to collect and process data, with decisions made based on that data" (p. 3). For example, management algorithms are able to react to supply and demand signals and is widely used by ride-hailing platforms such as Uber. Pricing algorithms, in turn, are mainly used for price discrimination through tracking Internet user history. Another practice is user segmentation, where the algorithms can set prices under marginal cost for one segment of people and at profitable levels for others.

Currently, the literature on algorithms suggests that they can facilitate collusion,³⁸ as well as collude without human influence. Ezrachi and Stucke (2015) identify four mechanisms for using algorithms for collusion: messenger, hub and spoke, predictable agent and autonomous machine (digital eye). In the messenger scenario, people use their computer to help implement, monitor and oversee the cartel (collusion by code). In the hub-and-spoke scenario, the use of a single algorithm by different parties (creating a hub) results in the operational part of the algorithm coordinating the cartel. Li and Xie (2018) describe these first two scenarios as "essentially the smoke-filled-room agreements of the digital era". The predictable agent scenario, where multiple parties use the same algorithm, could hypothetically generate a synchronization of strategies since the algorithms share the same learning concept. However, the authors emphasize that in this case, there would have to be an agreement, albeit a tacit one, to use the same algorithm in order for this to happen.³⁹

³⁴ According to *The Economist* (2018), when these firms enter the Tech Giants' kill zone, those that refuse to sell out see their services copied and end up losing their markets to the bigger firms.

³⁵ In this chapter, non-neutrality refers to the relationship between digital platforms and the content they manage. It differs from the concept of network non-neutrality applied to telecommunication networks.

³⁶ This is the case of Spotify versus Apple, where the latter charges Spotify 30% of every sale but also has its own music service; consequently, Spotify cannot provide services at the same price level as Apple.

³⁷ Sources indicate that Facebook would be selling its virtual reality glasses at a loss of US\$ 50 per unit, which obviously prevents other companies from competing with the giant. According to Stan Larroque, the founder and CEO of Lynx, "The message is we're Facebook and we don't care if we make money or not, but we'll flood the market and virtual reality will be Facebook Reality pretty soon," as reported by Bloomberg (McLaughlin, 2020).

³⁸ Algorithms facilitate the detection of changes in conduct, reduce the possibility of accidental changes and reduce agency slack, since they increase transparency (CMA, 2018).

³⁹ See Freshfields Bruckhaus Deringer (2017).

Finally, the autonomous machine scenario refers to self-learning capacity, conditioned on the complexity of the algorithms to improve the production of the final results. Therefore, this facilitates collusion significantly to the extent that the algorithms become increasingly sophisticated (algorithmic collusion).⁴⁰ According to Li and Xie (2018), in the first two cases, the probability of encountering evidence of collusion is high, whereas in the latter two cases the detection of collusive agreement by the competition authorities is much more difficult. Da Silva, De Furquin and Núñez (2020) review open cases in the region and in the world on the use of algorithms for collusion and anti-competitive practices in general. According to Horna and Papa (2018), it is necessary to close the gap between economic and judicial perspectives, since guilt, in cases of algorithmic collusion, is not easily determined under the current frameworks.

1. Proposals for addressing the algorithm problem

One proposal from the literature is the implementation of algorithm auditing (Horna and Papa, 2018). Under this measure, the competition authority can evaluate whether algorithms were designed for collusion, but there is a risk that the companies' coveted strategy would be leaked through the audit. While auditing is a promising measure, its implementation will require skills that are not currently available within competition authorities, especially in the case of younger agencies.⁴¹

The second proposal, by Ezrachi and Stucke (2017), is the implementation of a collusion incubator to carry out internal experiments with pricing algorithms. In this scheme, the agency examines the algorithms available in the market and then uses the data and algorithms to execute simulations in a collusion incubator. After building the simulation of the environment in which algorithms evolve, it is possible to discover the factors that destabilize tacit collusion, learn how the pricing algorithms respond when a firm enters the market with a similar algorithm, and investigate what happens when price changes slow.

In sum, algorithms facilitate the detection of changes in conduct, reduce the possibility of accidental changes and reduce agency slack, since they increase transparency (CMA, 2018). The regulators need to have a minimum of control over the scope of these tools, which are increasingly being used by firms as a business strategy and which are extremely powerful.

⁴⁰ Calvano and others (2018), who study the interaction between Q-learning algorithms in a context of workhorse oligopolies, find that "the algorithms consistently learn to charge supra-competitive prices, without communicating with one another" (p. 1). Li and Xie (2018) also find a positive response, while Klein (2020) suggests that collusion between algorithms is somewhat intuitive.

⁴¹ The difficulties include establishing whether the algorithm presented for auditing is the one that is actually used in the market. Additionally, it is almost impossible to simulate the environment in which the algorithms are developed and evolve (through automatic learning, trial and error, and changes in the market) until they collude with each other.

VI. The regional perspective: Mexico

A. The case of Mexico

Article 94 of the Mexican Federal Economic Competition Law empowers the competition authority to issue a preliminary ruling proposing corrective measures that it deems necessary to eliminate restrictions on the efficient functioning of the market under investigation (Mexico, 2017). According to Mexico (2017), under this Article, the board of the Mexican Federal Economic Competition Commission (COFECE) may include the following:

- i) Recommendations to public authorities [...]
- ii) An order to the pertinent economic agent to eliminate a barrier that unduly affects free market access and the fair competition process
- iii) Determination as to the existence of essential facilities and issue guidelines to regulate—as the case may be—forms of access, prices or rates, technical conditions and quality, as well as the application schedule
- iv) The divestiture of assets, rights, equity interest or shares of the economic agent involved, in the extent required to eliminate anti-competitive effects, [which] shall apply any time different corrective measures prove insufficient to solve the identified competition issue.

In an economy characterized by digital conglomerates, data monopolies and network effects, where market power is more easily established, the Mexican legislation guarantees innovator status in the application of competition protection. Many of the solutions that have been put forth in recent years, such as the breaking up of monopolies,⁴² interim measures and divestiture of assets, are already in effect for the Mexican authority. There is currently an intense global debate within the antitrust

⁴² Breaking up firms that are large enough to distort the market is not new; Standard Oil is perhaps the best-known case (Desjardins, 2017). COFECE has in its hands an important and dangerous tool that allows it to expel firms from given markets and thereby improve the level of competition.

community on market analysis tools, as well as discussion on the European Commission's new competition tool. According to Alejandra Palacios Prieto, Chair of the Federal Economic Competition Commission (COFECE), this new tool could wind up being similar to Article 94 of the Federal Economic Competition Law, a hybrid competition and regulation tool (OECD, 2020).

Despite having a tool with great potential for dealing with digital markets, Mexico's regulatory framework has caused conflicts between the authorities responsible for promoting competition in these markets. In Mexico, competition supervision is carried out by COFECE and the Federal Institute of Telecommunications (IFT), where the latter has jurisdiction solely in the areas of telecommunications and broadcasting. According to the competition legislation (Mexico, 2017), the authorities operate in different sectors of the economy and thus should not have inter-agency conflicts, but it is often difficult to draw the dividing line between the sectors. The competition law establishes a procedure wherein one of the authorities can lodge a complaint with the other authority on issues it considers to be within its jurisdiction, to determine who should carry out the investigation. In the absence of an agreement between the IFT and COFECE, a specialized court for economic competition, broadcasting and telecommunications will determine jurisdiction.

There have been repeated conflicts between the IFT and COFECE regarding digital markets and the regulation of digital platforms. Additionally, the Supreme Court of Justice is currently reviewing a controversy regarding the new dispatch rules issued by the electricity sector regulator (Navarro, 2021). COFECE considers the rules to be detrimental to competition to the extent that they favour fossil fuel electricity generation over renewable energies. These conflicts are a threat to the proper functioning of the market and the development of necessary technological capabilities in the region, and we argue that a country's competition authority should have the highest decision-making power on related issues. This argument is based on the fact that sectoral authorities do not have the infrastructure to combat the broad business models of the digital economy.

This conflict is not unique to the Mexican competition legislation. As shown in table 3, the application of antitrust policies is usually shared between the competition and telecommunications authorities in our sample of countries.

Table 3
Competition policy frameworks in Latin America

	Argentina	Brazil	Chile	Colombia	Costa Rica	Peru	Mexico
Legal framework (general)	Law No. 27.442 for the Defense of Competition.	Law No. 12.529 for the Defense of Competition (2011).	Decree Law No. 211 of 1973, General	Competition Law (Law 1340 of 2009).	Competition Law (Law 7472) and 2019	Competition Law.	Competition Law (2014)
	Telecommunications Law 27.078.	Telecommunications Law 9.472 (1997).	Competition Law.	ICT Law (Law 1341 of 2009).	Competition Reform Act (Law 9736).	Telecommunications Law (Legislative Decree No. 702).	Federal Law of Telecommunications and Broadcasting (2014)
	Supply Law No. 20,680 of 19741.		General Telecommunications Law (LGT).		General Telecommunications Law.		
Regulatory framework	Data Protection Law (congress).	Data Protection Law 13.709.	Personal Data Protection Law.	Law 1266 of 2008 (Financial Privacy Rules) and Law 1581 of 2012 (General Privacy Rules).	Law on the Protection of Individuals from the Processing of their Personal Data (Law No. 8968).	Personal Data Protection Act (PDPA) (Law 29733): Cybercrimes Law (Law No. 30,096).	Federal Law on the Protection of Personal Data in Possession of Particulars (2010)
	New Fair-Trade Regime (decree No. 274/2019.		National Policy on Cybersecurity.	National Policy on Artificial Intelligence	Big Data Action Plan.	Law on Computer Crimes (Law N° 9048)	
					Cybersecurity: Colombian Criminal Code.		

	Argentina	Brazil	Chile	Colombia	Costa Rica	Peru	Mexico
Platform regulation	New Law on Digital Platforms Work.		Tax regulations. New digital media bills.	Draft Digital Platforms Bills: Tax Regulations on Digital Platforms.	Digital Platforms Policies. Tax Regulations (Resolution DGT-R-13-2020).	Draft Digital Platforms Laws. Tax regulation Legislative Decree No. 945.	Section III of Chapter II (Title IV) of the Income Tax Law. Technological Platforms Tax Regulation Of the Provision of Digital Services by Residents Abroad without Establishment in Mexico. Chapter III - VAT
Competition authority	National Antitrust Commission (CNDC).	Administrative Council for Economic Defense (CADE)	Antitrust Court (TDLC) and the National Economic Prosecutor (FNE).	Superintendence of Industry and Commerce (SIC).	Costa Rican Competition Authority (COPROCOM).	SIPTEL: Competent in all matters concerning the telecommunications sector. Institute for the Defense of Competition and Intellectual Property (INDECOPI).	Federal Economic Competition Commission (COFECE)
Regulatory authority	National Entity of Communications (ENACOM).	National Telecommunications Agency (Anatel)	Ministry of Transport and Telecommunications (MTT) through the Undersecretary of Telecommunications (Subtel). National Television Council Law (CNTV).	Ministry of Information and Communication Technology (MINTIC). Communications Regulation Commission (CRC). National Spectrum Agency (ANE).	Telecommunications Superintendence (SUTEL).	Supervisory Agency for Private Investment in Telecommunications (OSIPTEL).	Federal Institute of Telecommunications (IFT)
Data protection authority		National Data Protection Authority (ANPD)		Superintendence of Industry and Commerce (SIC).			National Institute for Transparency, Access to Information and Protection of Personal Data (INAI)
Digital economy assets	Cerebro	Intelligence Unit	Sabueso	In Development	.	Article 94 of the Competition Law Digital Markets Competition Unit	

Source: R. Bustillo, "Analysis of competition policies in Latin America and the Caribbean and the post-pandemic recovery period", forthcoming, 2021.

Box 5 outlines the differences and similarities of the regulatory frameworks in our sample of countries. The seven countries in the sample all have a shared competition space, which can generate conflicts. The majority have an agenda for digitalizing competition and market assessment tools. On the other hand, with regard to the integration of competition and data protection, there is a lack of coordination and integration among the different authorities, which goes against the recommendations in this report.

Mexico is not the only country that has developed tools for addressing the challenges of the digital economy. The demand for modernization and innovation in the area of competition protection in digital markets has generated efforts in several countries; according to Núñez and Furquim (2018), modernizing the competition authorities is increasingly urgent. Box 5 highlights some of the digitalization initiatives launched by the competition authorities in the world in the face of challenges raised by the digital economy.

Box 5
Digitalization of competition authorities

A number of proposals for digitalizing regulatory models have been introduced in Latin America and the world.

- In Brazil, the Administrative Council for Economic Defence (CADE) has developed an interface called "Cérebro" that provides data mining tools and automates analysis using algorithms created previously by researchers and case managers.
- In Colombia, the Superintendency of Industry and Commerce used machine learning to develop a tool, called "Sabueso," for data collection, price monitoring and the detection of abnormal conducts in digital markets.
- In Costa Rica, the Commission to Promote Competition (COPROCOM) and the Superintendence of Telecommunications (SUTEL) have developed a roadmap and objectives for buying hardware and software to support digital forensic analysis, scheduled to be implemented in 2023.
- In Ecuador, the Superintendency of Market Power Control (SCPM) is in the process of implementing a digital tool that uses big data and artificial intelligence as the main inputs for the detection of digital cartels
- In Mexico, the Federal Economic Competition Commission (COFECE) created the Directorate General of Market Intelligence in 2014 which later became the unit responsible for digital evidence collection. The unit has used tools like Apache Spark (for big data), web scraping (data mining), parallel computing, cloud computing and artificial intelligence algorithms (machine learning). COFECE also has its innovative Article 94 of the competition law, which has great potential for fighting anti-competitive practices in the digital economy.
- In Chile, the National Economic Prosecutor (FNE) created an innovative Intelligence Unit to improve its investigation techniques for the prosecution of cartels. According to the institution, this unit will be in charge of implementing a data-science-based cartel detection system.

Examples from outside the region include the following:

- In the United Kingdom, the Competition and Markets Authority (CMA) has developed a software-based resale price monitoring programme, in its Data, Technology and Analytics (DaTA) unit.
- In the Republic of Korea, the Bid Rigging Indicator Analysis System (BRIAS), which was one of the first tools developed by a competition authority, has been used to detect the manipulation of public tender procedures.
- In Russia, the Federal Antimonopoly Service (FAS) has used algorithms to combat collusive practices, applying a multiple-parameter system for exposing and proving bid-rigging cartels. The FAS has detected 80 cartels in electronic contracting since 2017.

Strategies like these are welcome in the prevention of digital collusive practices and barriers to entry. These tools, even those that are in the initial phases in many countries, have already proven to be very important in the detection of bid-rigging cartels. Detecting cartels is essential for the survival of MSMEs^a.

Source: Organization for Economic Cooperation and Development (OECD), "Latin American and Caribbean Competition Forum - Session I: Digital Evidence Gathering in Cartel Investigations" (DAF/COMP/LACF(2020)10), 22 September, 2020 [online] [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/LACF\(2020\)10&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/LACF(2020)10&docLanguage=En); United Nations Conference on Trade and Development (UNCTAD), *The Impact of Cartels on the Poor* (TD/B/C.I/CLP/24/Rev.1), Geneva, 2013.

^a According to the UNCTAD (2013), "[SMEs] could also be indirectly affected by a cartel if they sell inputs to cartelists. Cartels increase prices and reduce output, and therefore SMEs are likely to see their sales to cartel members declining as a result of this anti-competitive conduct" (p. 3)

VII. Conclusion

The changes introduced by the new digital economy raise a challenge for competition authorities around the world, which face the daunting task of updating and adapting the regulatory and institutional frameworks that protect competition in the different markets of the digital economy. It is essential for the regulatory and institutional framework for competition to be in line with the country's development model, especially in the case of developing economies. Competition policy must be integrated with industrial policy and also with intellectual property policy, which should guarantee technology appropriation by smaller firms (MSMEs). The applied industrial policy should encompass the digital area and be consistent with the competition policy.

The key role and high value of data are central factors in this new economy, and the valuation of these intangible assets presents a major challenge for both firms and the authorities. The structure and formation of different types of data markets require measures that help determine their value. However, the analysis presented herein is only a preview of the process underway, in which the digitalization and datafication of the economy are deepening (through the Internet of things, IoT); technologies like blockchain, artificial intelligence and machine learning are examples of aspects of this process that have accelerated with the current health crisis and the growing digitalization of the markets. This scenario accentuates the need for an urgent review and modernization of competition policy and its role in the context of the recovery. Likewise, a sectoral industrial policy will also be needed to meet the challenges raised by the recovery of sectors that have been hard hit by the crisis. The growing importance of data in the digitalized economy calls for greater coordination among the agencies responsible for data protection and competition policy.

The combination of factors that until now served as the basis for competition policy has been overcome by the effects of disruptive technological changes on market dynamics. The presence of things like technology-enhanced collusion and tacit collusion between algorithms, the relevance of innovations and their role in market dynamics, the importance of mergers and acquisitions in the business model, predatory innovations (through interoperability), abuse of market power, the scope of network effects, non-neutrality and the creation of platforms as part of the new business models,

vast relevant markets and self-preferencing all interact non-linearly, intensifying the complexity of the new scenario of the digital economy. This scenario heightens the need for coordination between the different agencies responsible for policy implementation and for an inter- and intra-regional cooperation effort.

A. Recommendations

General

- The digital era demands greater participation by the competition authorities. In addition to adding new areas of analysis, such as data science, and ensuring an adequate infrastructure, it is necessary to recognize that the use of horizontal measures alone is no longer effective for combatting the current complexities.
- Competition policy must be integrated with industrial policy and in line with macroeconomic and foreign exchange policies.
- The solutions must be developed in conjunction with firms, because they could directly affect the companies' business models and strategies.
- M&A reporting requirements are an important tool for guaranteeing competition. In the context of digital markets, M&As can be significant from a competition perspective even when the amounts involved are small relative to traditional economic patterns. Notification thresholds should be lowered to capture such practices.
- Given the dynamics of the digital economy, competition authorities need more versatile tools. In this sense, we recommend changing M&A reporting requirements to a multi-criteria scheme.
- Cooperation between competitors has become a tool for accelerating the recovery and maintenance of global value chains, but it can result in anti-competitive practices since it gives companies a chance to learn more about their competitors' modus operandi.

Digital markets

- Conflicts between sectoral authorities and the competition authority can cause cost duplication, inefficiencies, legal uncertainty and the risk of inconsistencies in digital markets. It is therefore advisable to clearly demarcate the jurisdiction of each agency or to centralize the application of competition law in the competition authority. The strategy of expanding into adjacent markets further complicates the relationship between the different authorities because it obfuscates differentiation—and thus the allocation of jurisdiction—between sectors and markets in the digital economy.
- Broad relevant markets are a consequence of expansionary business models, so it is very important to know how to wrestle with these markets.
- Reversing the burden of proof can become an important tool for analysing M&As, since it can simultaneously provide relief for the competition authorities and reveal the real motive of the transactions.
- It is crucial to achieve integration between the spheres of competition and data protection in the analysis of the digital economy. Data and their use are characterized by a strong indirect impact, and it is very important to evaluate and combat these impacts in the current context.

- In digital markets with strong network effects, type I errors (over-enforcement) are preferable to type II errors (under-enforcement), since the effects of anti-competitive practices bear fruit quickly.
- Case-by-case analysis and the recognition of the need for differentiated policies for the different digital markets are essential for guaranteeing free competition.
- In digital markets, multi-homing and interoperability should be considered positive for competition, and any restrictions on them can be considered anti-competitive practices per se.

Innovation

- In the digital economy, innovation has become the main proxy for consumer welfare and proper market functioning. We therefore recommend using innovation instead of prices as the key criterion in digital markets.
- In analysing mergers when there is intent to expand into adjacent markets, the loss of innovation derives from both the incumbent, who will not develop its own product or service, and the bought-out company, which will not become an important player in the market.
- Authorization of an M&A should be assessed from the perspective of dynamic competition, when one of the parties is not able to bring the innovation to the market. The lack of financial resources can limit an innovation's potential and its market release. The adoption of this perspective has the ability to promote technology appropriation in the region.

Data and cybersecurity

- Promoting data cooperatives and initiatives that strengthen data accumulation on the part of SMEs could become a tool for fostering greater competition in the markets.
- Guaranteeing data access and flow is essential for increasing market competition.
- Data must be considered a relevant specialized asset in the competition model for the digital economy.
- Recognizing international information security standards promoted by the industry, with auditing and third-party certification, will contribute to managing the security risks.
- With regard to databases, non-exclusivity clauses/licences could provide a better solution to data exploitation problems than the use of divestiture measures. Facebook could use data supplied by WhatsApp to improve its products and services, but at the same time, the data would be available for a competitor to develop or improve its own products and services.
- Privacy and, therefore, cybersecurity affect consumer welfare, so the adoption of effective measures in this area will strengthen the welfare objective.

SMEs and digital platforms

- In the face of the increased dependence of individuals and SMEs on the digital platforms, the competition authorities must begin to develop rules to address a new post-COVID-19 reality—for example, a better evaluation of market power on digital platforms.
- Markets with strong network effects are correlated with anti-competitive practices and the presence of monopolies, so they need extra attention.

- Caution should be used in applying measures such as breaking up platforms or forcing asset divestiture, since they can result, for example, in higher prices due to the reduction of economies of scale and scope. Additionally, the loss of a database can lead to a reduction in quality, because data are an input for the personalization and improvement of services.
- From the perspective of the survival of SMEs, combatting non-neutrality and self-preferencing is important, mainly in the context of the pandemic where SMEs use the platforms to digitalize their business.
- Digital SMEs have become an important part of the digital economy. They are responsible for a large share of innovation and thus market dynamics, which demands special attention.
- The adoption of sectoral or company-specific measures can help address anti-competitive practices.

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