

Competition on Digital Markets: An Introduction

*Francesco Munari**

Summary: 1. Preliminary remarks: “real” competition issues in digital markets surpass predictive studies. – 2. The characteristics of economies of scale and of marginal and distributional costs in digital markets. – 3. Direct network effects in digital markets ... – 4. ... and indirect ones. – 5. The multi-sided market structure of digital markets. – 6. The value of data in digital markets. – 7. Economies of scope and vertical integration. – 8. Digital competition: from tipping markets ... – 9. ... to digital ecosystems. – 10. Conclusive doubts: faced with the limited effectiveness of “traditional” competition rules in digital markets, is a new mindset required? Will the *ex ante* approach provide adequate solutions?

1. Preliminary remarks: “real” competition issues in digital markets surpass predictive studies

It has been less than a decade since the publication of the first (and seminal) works dealing with the interaction between the so-called fourth industrial revolution and anticompetitive practices, and in particular speculating about what new anti-competitive conduct might have developed in digital markets¹.

Those studies mainly focused on the possibility of having algorithms capable of colluding autonomously, or on other forms of artificial intelligence capable of fragmenting the market by offering different conditions

* Full professor of EU Law at the University of Genoa, Italy – Partner Deloitte Legal. I wish to thank Prof. Luca Calzolari for valuable insights in discussing and preparing this chapter. Any mistake or omission remain entirely (and obviously) on myself.

¹ See for example the seminal work of A. EZRACHI, M.E. STUCKE, *Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy*, Harvard University Press, Cambridge, 2016.

to virtually every user, thus discriminating between them. At that time, they might evoke futuristic scenarios that would hardly become true. Reality, however, has probably exceeded what had been anticipated by the early scholars that engaged in this exercise: so much so that the enforcement practice of competition authorities around the world, including the European Commission (the “Commission”) and the Member States’ National Competition Authorities (“NCAs”), has begun to offer multiple examples of digital infringements of relevant provisions on cartels and abuses of dominant position, such as Article 101² and 102 TFEU³.

This is particularly true if one focuses on those conducts which, although closely related to the digital world, tellingly have always appeared as much more realistic, i.e. not so much on new forms of antitrust infringements committed by artificial intelligence, but rather on conducts involving “Big Data”: their economic and competitive value has proven to be enormous and their collection, analysis and use has allowed “Big Tech” firms (Google, Apple, Facebook, Amazon, and Microsoft, often referred to as “GAFAM”) to increase their market power⁴ and extend it across several markets at a pace never witnessed on physical markets, while at the same time making them able to exclude their competitors or to exploit consumers and business customers in innovative ways.

The above has caused several studies to be carried out, with a view to investigating whether digital markets enjoy features unknown to traditional markets or whether peculiarities exist in the competitive game taking place in these markets⁵.

Indeed, the general belief is that there is not a single feature characterizing and distinguishing digital markets from other “traditional” markets. Rather, what is distinctive about digital markets is the *concurrent* and *cumulative* presence of a remarkably large number of characteristics⁶

² See J. BLOCKX *Dawn of the Robots: First Cases of Algorithmic Collusion*, in this Book, p. 117.

³ See D. MANDRESCU, *Applying Article 102 TFEU to Multisided Online Platforms Discrimination, Leveraging and Undefined Abuses of Dominance*, in this Book, p. 87.

⁴ See V. CAFORIO, L. ZOBOLI, *Decoding Antitrust: Market Definition and Market Power within the Data Value Chain*, in this Book, p. 35.

⁵ Among the most recent, see G7 Competition Authorities, *Compendium of Approaches to Improving Competition in Digital Markets*, Hiroshima Summit, 8 November 2023, p. 10.

⁶ Obviously, reference is made here to economic notions on which tons of ink has

that, by contrast, are usually found *in isolation* in traditional markets⁷. This circumstance is paramount, is acknowledged by the Digital Markets Act (“DMA”)⁸, and brings unprecedented consequences in the affected economic/social sectors: firms grow much more rapidly and significantly, firms become “super-dominant” and win all the market, markets “tip” in favour of one firm only⁹. In the following paragraphs we shall try to discuss these issues in more details.

2. The characteristics of economies of scale and of marginal and distributional costs in digital markets

Digital markets are usually characterized by strong economies of scale, that are complemented by the absence of marginal and distributional costs. It is common ground that an increase in organizational size and/or in production levels usually leads to a decrease in the average cost of production per unit of output. In fact, the increase in size and/or output results in greater efficiency, because initial investments and other fixed costs borne by a given company to become operative and to grow are spread over a larger number of final products.

In the analogic world, however, the decrease in unit cost when outputs

been spilled by many prominent scholars and the present paper neither intends nor claims to make any in-depth analysis of them; rather, taking the risk of oversimplifying, we only wish to outline the functioning of digital markets, for illustrative purposes only. A few references to the key works and contributions dealing with specific concepts and notions that will be discussed below will be provided below regarding each of them.

⁷ See also F. LANCIERI, P.M. SAKOWSKI, *Competition in Digital Markets: A Review of Expert Reports*, in *Stanford Journal of Law, Business & Finance*, 2021, Vol. 26, Iss. 1, p. 65, p. 74.

⁸ Cf. Recital 13 of Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act).

⁹ While already used in the past for example to refer to the position of Tetra Pak II International SA on a traditional market (Court of Justice, case C-333/94P, *Tetra Pak II* [1996] ECLI:EU:C:1996:436), the concept of super-dominance has been recently used by the General Court to describe the position of Google on the market for online general search services (General Court, case T-612/17, *Google* [2021] ECLI:EU:T:2021:763, paras 182-183).

increase is not a forever process and indeed it experiences limitations: if output exceeds a certain level, unit costs may increase again and this increase may be even greater than the value of the increase in output, thereby giving rise to so-called diseconomies of scale. When marginal costs are higher than marginal revenues, economic operators have no incentive to increase production, for the costs to produce the additional units would exceed the profits. For example, this may happen when new investments are needed to increase production over a certain threshold but, to be paid off, the investment would require an increase in output on a scale that the firm does not believe it can achieve: in this scenario, the more rational choice for the firm is to keep production levels below the threshold that would make the investments necessary. In other words, the rational choice may be to refrain from growing.

In contrast, in digital markets the cost of production is much less than proportional to the number of customers served¹⁰. More precisely, the cost of servicing additional digital consumers with information goods (e.g., having a consumer carrying out one more search through a search engine; connecting one more user in a social network; or listing one more product in a digital marketplace) is close to zero¹¹; the above implies that “traditional” constraints on companies’ growth do not affect players which are active in digital markets¹².

In addition to this, in the digital world there are essentially no distribution costs for online services: just as the cost for the user to send an email remains the same (i.e., zero, net of environmental costs¹³), regardless of whether the email is addressed to the colleague next door of the sender or to a recipient located on the other side of the world, the same happens to a company offering its services globally: the only limited costs suffered by such company essentially correspond to the resources needed to overcome language and regulatory barriers. Besides, the lack of distributional costs

¹⁰ G. PETROPOULOS, *Competition Economics of Digital Ecosystems*, in OECD, *Competition Economics of Digital Ecosystems*, 2020, available at www.oecd.org.

¹¹ Cf. Final Report of the Stigler Committee on Digital Platforms, September 2019, p. 36 (the “Stigler Report”).

¹² For example, «[i]t took only five years for Facebook [...] to go from a million users in 2004, the year of its founding, to more than 350 million users in 2009, when it overtook MySpace for good» (cf. Stigler Report, cit., p. 37).

¹³ A. MAWBY, *The Environmental Cost of Email*, in *Fight Climate Change*, 22 May 2022, available at www.fightclimatechange.earth.

for digital services provides the explanation why in our sectors new markets often have a worldwide dimension from the very beginning¹⁴, unless “non-market” restrictions apply, such as political or geo-political ones.

3. Direct network effects in digital markets ...

Many digital markets experience very strong network effects¹⁵. A market exhibits network effects when the value of a product (a good or, more often, a service) increases with the number of customers using it. Again, this concept clearly predates the digital revolution: the textbook and most common example of (direct) network effect is indeed the land-line telephone: the more users have already a phone, the more likely is that a perspective user will decide to purchase one, as the expected benefit of the purchase (the possibility to communicate with other people) is higher. It is no coincidence that the theory of network effects began to be studied precisely in parallel with the invention and mass diffusion of such tool.

When a user joins a network, this creates multiple gains: first, there is the individual and private gain to that user, who can begin to use the product benefitting from the community of all other users already in the network; secondly, there is a collective benefit in favour of such other users, who not only can now interact also with the new user but also benefit from the higher appeal of the whole network¹⁶; lastly, there is a second private gain for the network itself and therefore for its owner¹⁷: the in-

¹⁴ So that, inter alia, «it is hard to analyse digital markets with the traditional concepts of geographical or product markets» (M. LIBERTINI, *Digital Markets and Competition Policy. Some Remarks on the Suitability of the Antitrust Toolkit*, in *Orizzonti del Diritto Commerciale*, 2021, Vol. 9, Sp. Iss., p. 337, p. 338).

¹⁵ Cf. J. ROHLFS, *A Theory of Interdependent Demand for a Communications Service*, in *Bell Journal of Economics and Management Science*, 1974, Vol. 5, Iss. 1, p. 16; M.L. KATZ, C. SHAPIRO, *Network Externalities, Competition, and Compatibility*, in *American Economic Review*, 1985, Vol. 75, Iss. 3, p. 424.

¹⁶ Cf. J.M. YUN, *Overview of Network Effects & Platforms in Digital Markets*, in D. H. GINSBURG, J. D WRIGHT (eds.), *The Global Antitrust Institute Report on the Digital Economy*, Global Antitrust Institute, Arlington, 2020, p. 2.

¹⁷ D.F. SPULBER, C.S. YOO, *Access to Networks: Economic and Constitutional Considerations*, in *Cornell Law Review*, 2003, Vol. 88, Iss. 4, p. 885, p. 922.

crease of the users makes the network more desirable not only to existing users but also to each additional user, thereby rendering the network more valuable¹⁸.

Direct network effects cause the network to grow, what, in turn, strengthens and consolidates the owner's market position¹⁹, as users increasingly benefit from being on the same network as other users. This phenomenon is common to a plethora of digital markets, from social networks to peer-to-peer online marketplaces (such as eBay).

4. ... and indirect ones

What is relevant for digital markets, however, is that direct network effects are almost invariably coupled with just as much strong indirect – or cross-group – network effects. Below we will see that this circumstance is due to, and inherently related to, the fact that in digital markets the market structure is very often two- or multi-sided. In fact, indirect network effects occur when a given network is used by two (or more) different groups of users that are interrelated and somewhat interdependent with each other. In this case, the benefit users belonging to one group derive from the network may become greater when the number of users belonging to another group increases²⁰.

Strictly speaking, not even cross-group network effects are a novelty or peculiarity of digital markets, as there were and are several examples of this phenomenon in the “analogic world” as well: brick-and-mortar

¹⁸ For an assessment of how this value can be calculated from an economic perspective see for example B. METCALFE, *Metcalfe's Law After 40 Years of Ethernet*, in *Computer*, 2013, Vol. 46, Iss. 12, p. 26.

¹⁹ See for example United States Court of Appeals, District of Columbia Circuit, 253 F.3d 34, *United States v. Microsoft Corp.* [2001]; United States Court of Appeals, District of Columbia Circuit, 147 F.3d 935, *United States v. Microsoft Corp.* [1998].

²⁰ Sometimes, network effects can occur at a “local” level, even in the digital economy. For example, customers of ride sharing services care less about the size of the entire network and instead place a high value on a subset of network participants, specifically those located in the same city (cf. C. YOO, *Network Effects in Action*, in D.H. GINSBURG, J.D WRIGHT (eds.), *The Global Antitrust Institute Report on the Digital Economy*, cit., p. 159; F. ZHU, M. IANSITI, *Why Some Platforms Thrive and Others Don't*, in *Harvard Business Review*, 2019, Vol. 97, Iss. 1, p. 118, p. 121).

shopping malls, newspapers, and yellow pages²¹ are among the most quoted examples; the value consumers place on a shopping mall depends on the number and quality of stores available but, at the same time, the value that retailers place on the mall (and thus, for example, their willingness to pay the rent) depends on the number of consumers who are likely to visit the mall. The same was true also regarding the relationship between the publishers of yellow pages and both their end- and business-customers: the former attributed value to the yellow pages based on the number of listings, and the latter were willing to pay listing fees based on the number of end customers who were likely to be reached and to use the yellow pages.

However, indirect network effects become exponentially larger in the context of the digital economy, both quantitatively and qualitatively. This is not a coincidence: the digital economy is based precisely on the role of online intermediaries, namely digital platforms, which can connect end users with business users. Indeed, the examples mentioned above are nothing but the ancestors of today's digital platforms, although in digital markets the scale of this phenomenon is enormously larger.

Indirect network effects can be reciprocal or asymmetrical²², with the latter being particularly common in digital markets. A clear example of the first case is represented by computers, video game consoles and, more recently, app-stores. Here, the relation between end users (the consumers) and business users (the developers of software, videogames, or apps) of the network (the computer, the console, or the app-store) is characterized by a clear two-way indirect network effect. The end users benefit when more and better developers are attracted to the network, because this leads to more and better software, games, and apps: when this occurs and they have more products at their disposal, end users are likely to consider the network more valuable²³. At the same time, however, developers are more likely to decide to design new product for networks having a large basis of end users: after all, the end users of the

²¹ Cf. M. RYSMAN, *Competition between Networks: A Study of the Market for Yellow Pages*, in *The Review of Economic Studies*, 2004, Vol. 71, Iss. 2, p. 483.

²² G. SHIER, T. BYRNE, *Economic Principles*, in M. WIGGERS, R. STRUIJLAART, J. DIBBITS (eds.), *Digital Competition Law in Europe*, Alphen aan den Rijn, Kluwer International, 2023, p. 7.

²³ Stigler Report, cit., p. 38.

network are the perspective clients for the software, games and apps designed by the developers.

Another example is represented by online marketplaces: an increase of the sellers means more choice for the buyers, and at the same time an increase of the buyers means more opportunities for sellers. Thus, when indirect network effects are reciprocal, the network increases its value when the number of both end and business users increases.

Asymmetric indirect network effects, by contrast, occur when the increase in the number of the participants belonging to one of the other group(s) benefits the latter but not vice versa. An example is represented by advertising-funded content platform, such as social networks²⁴. Here, an increase of the users is surely a positive factor for advertisers: by advertising on the platform, they can reach a larger group of potential customers. However, an increase of advertisers (and therefore of the ads) is unlikely to be considered a desirable development by users who usually prefer an ad-free experience.

5. The multi-sided market structure of digital markets

As it is already evident from the examples provided above, indirect network effects are inherently connected to another feature characterizing the structure of digital markets, i.e. their multi-sidedness. By definition, two or multi-sided markets involve indirect network effects, as the value that one group of users obtains from the network is determined not by the size of the entire network, and rather by the size of the other group of users²⁵.

From the viewpoint of the economic operator acting as an intermediary and connecting business users with end users, the greater the number of economic sectors that are brought into communication by platforms, the more the number of platforms themselves is reduced in favour of a small number of dominant players leading a few “digital ecosystems”²⁶. In this situation, the importance of the intermediators is substantially en-

²⁴ G. SHIER, T. BYRNE, *Economic Principles*, cit., p. 7.

²⁵ Cf. C. YOO, *Network Effects in Action*, cit., p. 168.

²⁶ See *supra*, para 4.

hanced, what has led to their qualification as “gatekeepers” of digital markets, as expressly acknowledged in the DMA²⁷. Gatekeepers enjoy the power to pick and decide winners and losers in the adjacent markets, discourage the switching to rival services, and punish undertakings that come too close to their domain²⁸.

Again, this is not a new phenomenon, because examples exist also in the pre-digital world. This is true for instance in credit cards, where the value attached to the network by merchants is not determined by the total network’s size, but rather by the number of cardholders; conversely, the networks’ value to cardholders is determined by the number of merchants participating in it²⁹.

Another non-digital multi-sided market is the market for newspapers³⁰. A newspaper can indeed be considered as an intermediary connecting advertisers (wishing to reach a target audience) and readers (wishing to access news and information). The newspaper provides a medium for both sides of the market to interact. The newspaper benefits from (asymmetric) indirect network effects, as more readers make the newspaper more valuable to advertisers, but not vice versa.

Digital markets are the realm of online platforms. Virtually all online platforms (regardless of their core business, e.g. a marketplace, a social network, a search engine) act as intermediaries between different groups of users who benefit from each other’s participation. Regardless of their activity, online platforms facilitate interaction, coordination, and exchange among two or more distinct and interdependent groups of customers. And in fact, the terms multi-sided platforms and

²⁷ See C. LOMBARDI, *Gatekeepers and Their Special Responsibility under the Digital Markets Act*, in this *Book*, p. 139.

²⁸ J.S. KANTER, *Digital Markets and ‘Trends Towards Concentration’*, in *Journal of Antitrust Enforcement*, 2023, Vol. 11, Iss. 2, p. 143.

²⁹ For examples in the Commission’s practice, see, Commission Decision of 17 October 2007 in case AT.38606 – *Groupement des cartes bancaires*; 19 December 2007 in case AT.34579 – *Mastercard I*; 29 April 2019 in case AT.39398 – *Visa MIF*. For a comparison with US case-law, see J. SIDAK, R. WILLIG, *Two-Sided Market Definition and Competitive Effects for Credit Cards After United States v. American Express*, in *The Criterion Journal on Innovation*, 2016, Vol. 1, p. 1301.

³⁰ C. IHLSTROM ERIKSSON, M. AKESSON, J. LUND, *Designing Ubiquitous Media Services - Exploring the Two-Sided Market of Newspapers*, in *Journal of Theoretical and Applied Electronic Commerce Research*, 2016, Vol. 11, Iss. 3, p. 1.

multi-sided markets are considered almost as a synonymous of the digital economy³¹.

With that said, a critical feature of multi-sided markets is that, quite often, the different sides of the markets are also strictly interdependent: *inter alia*, this means that the optimal pricing and output strategy to be adopted by the intermediary on one side of the market depends on the demand and supply conditions on the other side. The optimal price and output strategy for one kind of customers may therefore depend on how competition works on the other side.

This leads to the possibility to have so-called “Zero Price Markets”, because platforms can – and indeed very often do – offer “free services” to one kind of users (e.g. consumers) and profit from the revenue made from another kind of users (e.g. advertisers)³²: in the light of what has been discussed above (network effects etc.), offering free services can be the best strategy to maximize the overall profit, as this may lead to significantly increase the number of users on the “free” side of the market, thereby making the users operating on the other side of the market more willing to purchase the services sold by the platform³³.

By the same token, the “free services” affect one pillar of the traditional antitrust discourse, *i.e.* the dogma of the rational choice of consumers: a zero-price service tends to obfuscate the capacity of the buyer to select the theoretical best option existing in the market. And this, as we shall see below, seems relevant for our analysis.

6. The value of data in digital markets

Irrespective of the possibility of subsidizing the service offered “free of charge” with the revenues earned on any of the other sides of the market on which a platform is active, in fact data have *per se* a funda-

³¹ Cf. J.M. YUN, *Overview of Network Effects*, cit., p. 2.

³² A. FLETCHER, *Digital competition policy: Are ecosystems different?*, in OECD, *Competition Economics of Digital Ecosystems*, cit., p. 3: «[t]his is why a number of digital services – such search and social media – are provided free to consumers. The services are effectively paid for by business users who seek the attention of the consumers on the other side of the platform».

³³ M. LIBERTINI, *Digital Markets and Competition Policy*, cit., p. 339.

mental importance in the digital economy. In other words, also (and probably especially) in digital markets «*there ain't no such thing as a free lunch*»³⁴ and the price paid by customers in exchange for allegedly free services is represented by their data³⁵, whether of personal nature or not³⁶.

When a given online service attracts more and more users, the platform providing such service also gathers more data, that enjoy a two-fold nature³⁷, i.e. as by-product of any digital activity and as a key input to provide digital services. Analytics tools are normally used to examine data and extract knowledge and value. For a platform, reaching a critical threshold of users and data is therefore crucial to operate, become and remain competitive on the market.

The collection and availability of data is therefore relevant from several perspectives, including antitrust. In fact, if the need to reach a large mass of users and data is necessary for the platform to be able to offer the service representing its core business and to compete on the market, one can imagine that the possession of data is a barrier to entry in the market, securing incumbents from competition from newcomers. At a first glance, the qualification of data as entry barrier would seem belied by their ubiquity, replicability and non-rivalry. In this sense, one might argue that data are unlikely to represent *per se* a source of market power³⁸ or a barrier to entry of competitors in a given market³⁹.

And yet, in a diachronic sense the above conclusion appears less per-

³⁴ To quote the well-known adage used by M. FRIEDMAN, *There's No Such Thing as a Free Lunch*, Open Court Publishing Company, Chicago, 1975. Concerning the issue at stake see already J. KOPONEN, A. MANGIARACINA, *No Free Lunch: Personal Data and Privacy in EU Competition Law*, in *Competition Law International*, 2013, Vol. 9, Iss. 2, p. 183.

³⁵ See already D.S. EVANS, *The Antitrust Economics of Free*, in *Competition Policy International*, 2011, Vol. 7, Iss. 1, p. 71.

³⁶ Cf. Regulation (EU) 2016/679 of the European Parliament and of the Council, of 27 April 2016, on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation – “GDPR”).

³⁷ A. FLETCHER, *Digital competition policy*, cit., p. 2.

³⁸ G. PITRUZZELLA, *Big Data, Competition and Privacy: A Look from the Antitrust Perspective*, in *Concorrenza e del Mercato*, 2016, Vol. 23, p. 15, p. 20.

³⁹ D.S. TUCKER, H. WELLFORD, *Big Mistakes Regarding Big Data*, in *Antitrust Source*, American Bar Association, 2014, p. 7, available at www.papers.ssrn.com.

suasive. The most immediate example comes from search engines⁴⁰, that rely on the analysis of data, i.e. past search queries: by exploring the links between (past) search queries and the subsequent clicks by (past) users, search engines learn from their users' behaviours to deliver more relevant and higher quality results for each query: the more data on past search queries they have, the better their services become⁴¹.

Yet, these data are not available to newcomers. On zero-price markets, it is difficult to enter into such markets without quality; but without data from past search queries, new and smaller providers of search engines services cannot offer the same quality as larger providers and incumbents⁴². Therefore, the so-called click-and-query data are crucial for the success of search engines.

The same holds true, however, also for other services offered in digital markets: data help platforms to profile users, hence constantly enhancing their capacity to tailor prospected purchasers for potential sellers located on the other side of the market. Again, this value is not available for newcomers or smaller competitors.

With that said, the example of search engines is also interesting because it provides the opportunity to highlight an additional issue characterizing the application of competition law in digital markets, namely the challenge which sometimes arises in tailoring typical antitrust concepts to this environment. The idea that a search engine's results improve as the number of its users increases, coupled with the fact that qualitative improvement in results eventually attracts more users to that search engine, seems to mirror the typical pattern of network effects: after all, the value of the services offered to users by the search engine depends on how many other users have used it.

However, network effects (whether direct or indirect) occur on the demand side: people prefer to use a given product or service because oth-

⁴⁰ Cf. M.E. STUCKE, A.E. EZRACHI, *When Competition Fails to Optimize Quality: A Look at Search Engines*, in *Yale Journal of Law & Technology*, 2016, Vol. 18, p. 70, G. PITRUZZELLA, *Big Data and Antitrust Enforcement*, in *Italian Antitrust Review*, 2017, Vol. 1, p. 77, p. 79.

⁴¹ *Inter alia*, M. SHAEFER, G. SAPI, L. SZABOLCS, *The effect of Big Data on Recommendation Quality. The Example of Internet Search*, DICE Discussion Paper No 284, 2018.

⁴² See L. CALZOLARI, *International and EU Antitrust Enforcement in the Age of Big Data*, in *Diritto del Commercio Internazionale*, 2017, Vol. 31, Iss. 4, p. 855, p. 871, also for further references.

ers people do. By contrast, the positive feedback loop that attracts more and more users to a given search engine occurs on the supply side. New users prefer to use the existing search engine not because other people do, and rather because the search engine offers better results than newcomers do, because of its wider customer base. Search engines improve the quality of their services by getting more users and therefore more queries and learning from them. This concept is called learning by doing: production is generally improved through practice and experience.

For some scholars, this positive outcome should not be altered or chilled by antitrust rules addressing the dominant position of the global incumbent⁴³; the above may be understandable from a pure antitrust perspective focused on consumer welfare, and yet the impression is that a more thorough analysis is still ongoing: as highlighted above, in a zero-price market consumer preferences are at best less clear; moreover, even quality of the services can be hardly measured without a comparison among competing providers (or platforms): but this often implies the use of time which most customers would consider as wasted (e.g. very seldom the same search is done on two or more engines); therefore, the decrease in quality (including the issue of profiling some results better than others for customers) is not so easily perceivable. In fact, in digital markets the “knowledge illusion” is particularly striking⁴⁴, and this casts in doubt one of the main tenets of many antitrust lawyers, i.e. the rational choice of consumers/firms in the market.

Additionally, the availability of large dataset may also allow the platform to expand its business quickly and easily into other sectors and markets adjacent to the core one in which it already operates. The latter is the most problematic scenario from an antitrust perspective, insofar as it means that platforms can cross-leverage their data-driven market advantages across distinct sectors and businesses, thereby extending their market power (and possibly dominance) across markets⁴⁵, whether existing or new⁴⁶.

⁴³ R.H. BORK, J.G. SIDAK, *What does the Chicago school teach about internet search and the antitrust treatment of Google?*, in *Journal of Competition Law & Economics*, 2012, Vol. 8, Iss. 4, p. 663.

⁴⁴ See S. SLOMAN, P. FERNBACH, *The Knowledge Illusion. Why We Never Think Alone*, Penguin, London, 2017.

⁴⁵ See for example L.M. KHAN, *The Ideological Roots of America's Market Power Problem*, in *Yale Law Journal Forum*, 2018, Vol. 127, p. 960, p. 961.

⁴⁶ «For example, generative AI, which becomes a hot topic in the world in 2023, is

In other words, the fact that the services offered by platforms are based on collecting and extracting value from data brings other quite relevant consequences: more precisely, and as addressed below, digital markets are characterized also by very strong economies of scope.

7. Economies of scope and vertical integration

Economies of scope occur when the costs already sustained by a company to produce a given product reduce the costs that shall be born to produce a different product⁴⁷. Hence, an economy of scope occurs when there are sharable inputs in the production process so that the joint production of two (or more) products is more cost effective than producing each of those two (or more) products independently⁴⁸.

Although here the focus is on the scope of the activities of a company, the effect is very similar to the one described above concerning economies of scale: thanks to the combination of two or more products lines, larger firms offering more types of products can lower their average costs, just as they can do by producing more units of the same products. In the end, what matters is that the cost savings give larger companies an advantage over smaller competitors producing only one or few products.

As said, in digital markets, economies of scope are likely to be particularly intense. The cost structure characterizing the activities of online platforms (i.e., high fixed and low marginal costs) and the relative ease with which the same core infrastructure can be used to offer digital services across a range of different markets⁴⁹; consequently, online platforms represent the perfect candidate to benefit from economies of scope⁵⁰. Indeed, digital products typically involve a clear modular de-

clearly a service backed by massive amounts of data and thus it once again highlighted the importance of accessibility to data assets» (G7 Competition Authorities, *Compendium*, cit., p. 8).

⁴⁷ See for example J.C. PANZAR, R.D. WILLIG, *Economies of Scale in Multi-Output Production*, in *The Quarterly Journal of Economics*, 1977, Vol. 91, Iss. 3, p. 481.

⁴⁸ J.C. PANZAR, R.D. WILLIG, *Economies of Scope*, in *American Economic Review*, 1981, Vol. 71, Iss. 2, p. 268.

⁴⁹ A. FLETCHER, *Digital Competition Policy*, cit., p. 5.

⁵⁰ G. SHIER, T. BYRNE, *Economic Principles*, cit., p. 8 and p. 241.

sign, where production inputs can be used for more final products, because of the high level of standardization⁵¹.

The above explains why online platforms can thus easily offer more products and services to users at a lower cost than a firm that offers only one service by using their existing digital infrastructure and user base. For example, the decision to sell more types of products (e.g., not only books but virtually everything) has very limited direct costs for the marketplace that chooses to pursue this strategy, as the Amazon experience clearly tells us⁵². The same applies to the decision of a social media to offer to users not only the possibility to interact between them but also to access news, jobs offer or dating profiles that have been selected for them directly by the platform⁵³.

The latter example further shows that, as already recalled, in digital markets production inputs do not include hardware or software components only; in fact, a fundamental component (and driver) is made by data⁵⁴: as long as a digital platform has a sufficiently large user base on its primary market, the data collected on such market can be used by the

⁵¹M. BOURREAU, *Some Economics of Digital Ecosystems*, in OECD, *Competition Economics of Digital Ecosystems*, cit., p. 4, noting that «[f]or example, Apple uses and re-uses its in-house processors across its product lines for iPhone, iPad, and Mac, rather than developing a specific processor for each device. Similarly, the progress made in artificial intelligence and algorithms allows companies like Google or Facebook to improve a whole range of services».

⁵²Indeed, «[i]f Amazon has established an online infrastructure for delivering ebooks, the incremental cost of using this to deliver digital audio and video may be substantially lower than would be the stand-alone cost of this activity» (cf. A. FLETCHER, *Digital competition policy*, cit., p. 5) To be sure, a “cost” of this strategy might be represented by the consequences of moving from being a specialist market place to be a generalist one, which can make a company’s fortunes (see Amazon) or lead to its failure, depending on how the repositioning is perceived by customers who, as the market place loses its name of specialist site, might decide to turn to other generalist market places.

⁵³Indeed, «Facebook recently entered the dating market with Facebook Dating, a service that relies on the data collected from social network users to find relevant matches» (cf. M. BOURREAU, *Some Economics*, cit., p. 4).

⁵⁴The «importance of data as an input for many digital services» shows that «where applicable, those with significant data collection and processing capabilities have a sizeable competitive advantage» (K. VAN HOVE, A. PAPAETHYMIU, *Revising the Competition Law Rulebook for Digital Markets in Europe: A Delicate Balancing Act*, in *Competition Policy International*, 11 October 2020, available at www.competitionpolicyinternational.com).

platform to design and improve the products offered on other markets and therefore to expand their activities into new areas⁵⁵. The peculiarity is that the competitive advantage that the platform is often able to gain from analysing the data collected on its core market often enables the platform to enter into different but connected markets more quickly and with higher quality products compared to those that could be created by the “ordinary” newcomers that do not have at their disposal such data availability⁵⁶.

As the platform system fades the boundaries between different products and markets⁵⁷, digital markets are characterized by a growingly high degree of vertical integration; indeed, more and more these markets present a market structure in which the platform is also active in downstream and/or upstream markets from the one represented by its stronghold. Thus, the platform is increasingly found to compete (also) with its customers⁵⁸, what has been depicted as the realm of so-called frenemy relations⁵⁹, as business users rely (and need) the platform to reach their customers but at the same time shall fear the platform as a prospective competitor⁶⁰.

Cross-sector leverage of data-driven competitive advantages may lead to competitors’ exploitation and foreclosure. For example, online platforms can collect and analyse sales data to early detect new successful products sold on the platform by third parties (manufacturers or retailers). Once that a successful product is detected, online platforms may benefit

⁵⁵ A. FLETCHER, *Digital Competition Policy*, cit., p. 5.

⁵⁶ Stigler Report, cit., p. 37.

⁵⁷ Indeed, «[t]he platform system makes it easier, for large platform businesses, to entry different markets than their “native” sectors. The boundaries between product – or service markets become weak, and businesses which have market power can easily extend their power to other markets, even though they are new entrants into these markets» (cf. M. LIBERTINI, *Digital markets and competition policy*, cit., p. 339).

⁵⁸ For example, «Amazon has continually utilized its market power to enter new market verticals such as the Whole Foods market, through which even rivals rely on Amazon-owned infrastructure» (B. Atrakchi-Israel, Y. Nahmias, *Metaverse, Competition, and the Online Digital Ecosystem*, in *Minnesota Journal of Law, Science & Technology*, 2023, Vol. 24, Iss. 1, p. 235, p. 238).

⁵⁹ A. EZRACHI, M.E. STUCKE, *Virtual competition*, cit., p. 145.

⁶⁰ See for example F. ZHU, *Friends or foes? Examining platform owners’ entry into complementors’ spaces*, in *Journal of Economics & Management Strategy*, 2019, Vol. 28, Iss. 1, p. 23.

from the information gathered in many ways, such as by disintermediation, by launching similar products or by informing their investment decisions⁶¹.

A reality check fully confirms that, in the last few years, GAFAM and other Big Tech Firms have achieved very high degrees of diversification in different ways. While this trend may increase the value of the platform also for its users (both end users and business ones) the extension of the platform activities downstream, upstream or “to the side” mainly ends up benefiting the platform itself, which can consolidate its market position by creating in adjacent markets some sort of “protective fences” (i.e., barriers to entry) that shield the platform’s core business from competition⁶².

Again, the image is that of the “ecosystem”, in which the offering of services, either directly from the platform itself, or from third parties (app developers, vendors on market places etc.), ends up creating a few alternative quasi-integrated systems among which users can choose. As discussed below, the above has clear consequences on the development of competition, on the one side, because the existence of ecosystems increases switching costs for users, thus reinforcing lock-in effects; on the other side, because competitive pressure seems to develop more among these ecosystems than with respect to individual activities and services.

8. Digital competition: from tipping markets ...

Even considered individually, each of the characteristics discussed in the previous paragraph may affect the competitive dynamic of a given market. But when considered in their joint existence and development, they determine the rapid and unlimited growth of undertakings: for the dominant players, economies of scale and scope, network effects and the lack of marginal and distributional costs end up to render a market subject to “tipping”.

⁶¹ L. CALZOLARI, *International Antitrust Enforcement*, cit., p. 873.

⁶² This goal can be reached also (and significantly) through mergers, as mergers can «help platforms preserve their monopoly position and forestall competition by engaging in ‘moat-building’, a strategy through which platforms create barriers that protect their realm from outside threats» (J.S. KANTER, *Digital Markets*, cit., p. 143).

A tipping market is a market that is prone to shift from a competitive state to a monopolistic or oligopolistic one⁶³. Indeed, markets subject to tipping not only present clear trends toward high levels of concentration, but actually tend also to concentrate around a single, super-dominant undertaking which takes the whole market⁶⁴. Saying that a market has tipped in favour of a given undertaking means that the latter has taken most or all the market share, leaving little or no room for competitors, i.e. has “won the market”. In other words, in a tipping market... the winner takes all⁶⁵.

Thus, digital markets, be they social media, search engines, e-commerce, or online advertising, tend to tip in favour of the platform that can attract the most users or advertisers. But not only: the growth of the undertaking whose destiny is to win the market and the concentration of such market around the former very often proceed at a breakneck pace, unparalleled in the “non-digital” world⁶⁶. Once this has happened, however, lock-in effects and switching costs then tend to protect the market position of the winner, even if a better product or standard were to emerge⁶⁷. For instance, even if Mastodon is generally considered to be a

⁶³ In economics, «tipping is the snowball effect that kicks in once a product crosses a critical point of user adoption, catapulting the supplier away from competition and towards a monopoly equilibrium» (N. PETIT, N.M. BELLOSO, *A Simple Way to Measure Tipping in Digital Markets*, in *Promarket*, 6 April 2021, available at www.promarket.org).

⁶⁴ The markets where digital platforms «operate exhibit several economic features that, while not novel per se, appear together for the first time and push these markets towards monopolization by a single company» (cf. Stigler Report, cit., p. 3; see also F. LANCIERI, P.M. SAKOWSKI, *Competition in Digital Markets*, cit., p. 75).

⁶⁵ Stigler Report, cit., p. 35.

⁶⁶ Indeed, «while a traditional business often starts with local implementation followed by gradual expansion through investment as reputation and financial resources increase, many online businesses aim at rapid large-scale expansion. This rapid growth may reduce the length of the competition-for-the-market phase, as market winners can establish dominance and begin exercising their market power quickly» (cf. Stigler Report, cit., at p. 36).

⁶⁷ To sum up, the idea is that «even if a better, superior product or standard were to emerge, customers may stick with the inferior product because its network is larger and the market has already tipped in its favor. This effect is compounded in the presence of switching costs; but even with nominal switching costs, there could still be a path dependency if there is a coordination problem that inhibits migration. A particular user might prefer a competing product or standard for various reasons, including an objective-

superior product *vis-à-vis* Twitter/X, the number of users of the former still remains less than 2 million after some years of operation, while Thread, the new “competitor” launched by Meta by the end of 2023, has surpassed in a few days more than 100 million users⁶⁸.

Monopolization may not necessarily be the only ultimate outcome of digital markets, and we experience some different outcomes, such as the markets for online video streaming services⁶⁹; yet, the acquisition of huge market power by the market leaders is a very common feature when it comes to digital markets⁷⁰.

With this said, tipping markets pose significant challenges for antitrust authorities, as their analysis requires approaches that are not the same normally used in other cases, in order to handle issues such as market power assessment, potential competition, and consumer welfare.

In markets with tipping effects, the competitive process works differently than in other markets and the focus is shifted «*from competition in the market to competition for the market*»⁷¹. While strong competition characterizes the first stage, as different companies struggle to become the leading provider of a given service (i.e., to win the market)⁷², when the market has been won by one undertaking, it is generally witnessed a long period of weak competition and the winner can exercise its market power being somehow shielded from competitive pressure.

One example is the market for search engines services: while in the digi-

ly superior set of features; however, without the ability to bring over a large proportion of other users in a collective switch, the theory is that the competing network will stall». (cf. J.M. YUN, *Overview of Network Effects*, cit., p. 5).

⁶⁸ See J. JÜRGENS, *Eine Mammutaufgabe*, in *ZeitOnline*, 12th November 2023, available at www.zeit.de.

⁶⁹ Cf. O. PAKULA, *The Streaming Wars+: An Analysis of Anticompetitive Business Practices in Streaming Business*, in *UCLA Entertainment Law Review*, Vol. 28, 2021, p. 147. There are of course other exceptions: for example, the market for travel sites consists of numerous players all vigorously competing with one another without collapsing into monopoly. In addition, Uber’s first-mover advantage was unable to prevent the emergence of Lyft as a serious competitor (cf. C. YOO, *Network Effects in Action*, cit.).

⁷⁰ M. LIBERTINI, *Digital Markets and Competition Policy*, cit.

⁷¹ Stigler Report, cit., p. 29 and p. 35.

⁷² For example, «Uber and Lyft have hotly contested the market for ride-sharing—and spent billions of dollars subsidizing riders’ fares along the way. One 2016 estimate suggested that payments from Uber customers covered only about 40% of the cost of their rides» (also for the references see Stigler Report, cit., p. 39).

tal “pre-history” the first ever search engines were operated through a manual indexing mechanism, the first truly automated search engine was launched by Altavista and Yahoo in 1995; only in 1998 Google was founded and Bing, Microsoft’s search engine, came into operation in 2009. In the early 2000s competition among these search engines was intense and market shares were evenly divided⁷³, but eventually the market tipped in favour of Google, which, at least in Europe, has now been holding a market share of more than 90 percent for more than a decade⁷⁴; at the same time, the first mover Altavista shut down in 2013, after having been purchased by Yahoo.

A more recent example, still in the “struggle for the market” stage, seems artificial intelligence and, in particular, so-called generative one: ChatGPT, Bard and Bing are just some of the current market players operative in this pioneering moment, and it remains to be seen whether in the future the market will reward only one of these. Remarkable is, however, the fact that many of the companies active in this new sector are directly or indirectly connected to one of the GAFAMs, this confirming the market landscape and features highlighted above.

9. ... to digital ecosystems

Once again, by no means tipping markets constitute a new phenomenon. There are countless analogous cases in traditional markets. An example can be found in the market for video cassette recorders in the 1970s and 1980s. In those years, two main formats were developed by competing undertakings, Sony and JVC; Sony launched the Betamax technology in 1975 and JVC launched VHS in 1976. The former was better from a qualitative perspective, but the latter was cheaper and allowed longer recording. These features, coupled with the ability by JVC to ensure that the VHS standard was backed from other makers and content providers, more and more consumers chose VHS, until the market eventually tipped in its favour: by the end of the 1980s, JVC held a market share higher than 90%⁷⁵.

⁷³ For further data see J. GANDAL, *The Dynamics of Competition in the Internet Search Engine Market*, Working Paper No CPC01-17, 2001.

⁷⁴ Commission Decision of 27 June 2017 in case AT.39740 – *Google Search (Shopping)*.

⁷⁵ J.D. CARRILLO, G. TAN, *Platform Competition with Complementary Products*, in